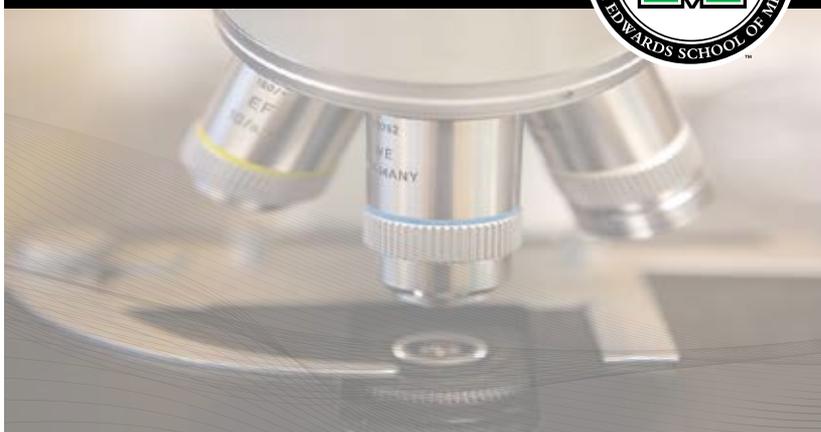


HEALTH SCIENCES CENTER 29TH ANNUAL RESEARCH DAY AT MARSHALL UNIVERSITY MARCH 24, 2017

Oral and Poster Presentations

Marshall University Medical Center • Huntington, West Virginia

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March 23 - Special Viewing - Case Study Poster Presentations - 4:00PM-5:30PM – Medical Center Atrium

This event is supported annually by educational grants from the following Endowments:

Thelma V. Owen Memorial
Richard J. Stevens Memorial

Faculty Disclosure Policy 2017

As a provider accredited by the ACCME, Marshall University Joan C. Edwards School of Medicine must ensure balance, independence, objectivity, and scientific rigor in all its individually provided or jointly provided educational activities. All event faculty participating in a provided activity are expected to disclose to the activity audience any significant financial interest or other relationship with the manufacturer(s) of any commercial product(s) and/or provider(s) of commercial services discussed in an educational presentation and 2) with any commercial supporter(s) of the activity. Also, all event faculty are required to disclose any planned discussion of an unlabeled use of a commercial product or an investigational use not yet approved for any purpose by the FDA.

No Faculty Disclosure or conflicts of interest are indicated for this CME activity.

Disclosure of Conflicts of Interest

Marshall University Joan C. Edwards School of Medicine (MUJCESOM) requires instructors, planners, managers and other individuals who are in a position to control the content of this activity to disclose any real or apparent conflict of interest they may have as related to the content of this activity. All identified real or apparent conflicts of interest are thoroughly reviewed and resolved by MUJCESOM's planning process for fair balance, scientific objectivity of studies mentioned in the materials or used as the basis of content, and appropriateness of patient care recommendations. Disclosure information will be presented verbally or in print to participants before presentation of the agenda lectures.

Completed faculty disclosure forms are on file in the CME Office.



Marshall University Joan C. Edwards School of Medicine is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to provide continuing medical education for physicians.

The conference will consist of a series of oral and poster presentations highlighting basic and clinical research performed by School of Medicine students, residents and fellows. Please use pages 12 and 13, to locate presenters, their abstracts, presentation times and location of presentation. The complete agenda begins on page 14. The complete syllabus is available online at <https://jcesom.marshall.edu/research/office-of-research-graduate-education/research-day/>

INTENDED AUDIENCE

The Health Science Center 29th Annual Research Day at Marshall University is designed for physicians, residents, basic scientists, medical students, graduate students, and other interested health professionals.

GOALS

- 1) To involve faculty, medical and graduate students in the process required to formally present their research in either oral or poster presentations.
- 2) To inform and involve the community in ongoing research at Marshall University Joan C. Edwards School of Medicine.
- 3) To encourage the attitude among faculty, residents, and students for Continuing Medical Education in the area of clinical research.

GLOBAL LEARNING OBJECTIVES

By the end of these lectures the participant will be able to:

- 1) Compare different approaches to medical investigation.
- 2) Compare and contrast the importance of basic research and cellular mechanisms as it relates to human disease.
- 3) Discuss and review research related to current and future improvements in the clinical management of patients.
- 4) Interpret and analyze data for medical investigation to potentially determine the effectiveness towards improving patient care.
- 5) Stress the importance of translational research benefits to the basic scientist in support of the practicing physician.

CREDIT STATEMENT

Marshall University Joan C. Edwards School of Medicine designates this live educational activity for a maximum of 5.0 AMA PRA Category 1 Credits™. Physicians should only claim credit commensurate with the extent of their participation in the activity. (Session Registration and Evaluation are required).

EVALUATION FORM Completion

Please follow specific instructions for completing the bar coded evaluation form. Keep your "X's" in the bubbles and your written comments in the designated boxes. Your input is needed for planning future events.

ASSISTED SERVICES

If special arrangements are required for an individual with a disability to attend these events, please contact Continuing Medical Education at (304) 691-1770 no later than 1 week before the event date or See a CME Representative at the Registration Area on the day of the event.

PLANNING COMMITTEE - NO CONFLICTS INDICATED

Uma Sundaram, MD, Conference Chair, Vice-Dean, Research and Graduate Education

Todd Gress, MD, Co-Chair, Assistant Dean, Clinical and Translational Research

David N. Bailey, MBA, Assistant Dean, CME

Richard Egleton, PhD, Co-Director, Biomedical Sciences Graduate Programs

Brian Patton, Director, Digital Media Services

STAFF COORDINATORS - NO CONFLICTS INDICATED

Anita MathisBMS Coordination & Registration

Patricia "Trish" MartinRegistration

Brian PattonWeb Publications, Online Abstract
Submission Form Design and Content
Retrieval, Judging tabulations summary

RESEARCH DAY

SPECIAL THANKS TO:

MU Publications • Abstract Booklet Publication
MUMC Maintenance Staff • Facility Preparation
MU Foundation • Endowment Fund Accounting
Cabell Huntington Hospital Food Service



PAST INVITED LECTURERS

2016 Naji Abumrad, MD

Chair Emeritus, Department of Surgery
John L. Sawyers Professor of Surgery
Vanderbilt University School of Medicine
Nashville, TN

1) *The Life of an Academic Surgeon Persevere, Don't be afraid, Explore*

2015 Richard J. Johnson, MD

Tomas Berl Professor and Chief
Division of Renal Diseases and Hypertension
University of Colorado Anschutz Campus
Aurora, CO

1) *The Role of Sugar (fructose) in the Great Epidemics of Diabetes and Obesity*

2014 - Jose S. Pulido, MD, MS, MBA, MPH

Professor of Ophthalmology and Molecular Medicine
Associate in Neuro-oncology
Mayo Clinic Cancer Center
Rochester, MN

1) *The Topology of Blinding Eye Disease*

2) *Breaking bad and Breaking good*

2013 - John J. Cannell, MD

Executive Director
Vitamin D Council
San Luis Obispo, CA

1) *The Use of Vitamin D in Clinical Practice*

2012 - William Thies, Ph.D.

Vice President, Medical Scientific Affairs
Alzheimer's Association
Chicago, IL

1) *Alzheimers Today and the Future*

2011 – Susan S. Smyth, MD, Ph.D.

Professor of Medicine
Director, MD/Ph.D. Program
University of Kentucky

1) *Cardiovascular Complications of Obesity*

2010 – Gregory Germino, MD

Deputy Director of the National Institute of Diabetes and Digestive
& Kidney Disease (NIDDK) at the National Institutes of Health (NIH)
Bethesda, Maryland

1) *Dia-besity: converging problems, emerging science*

2008 – Gregory Alan Hale, MD

Associate Professor of Pediatrics
University of Tennessee

1) *Transplantation and Cellular Therapies: Current Research
and Future Opportunities*

2) *An introduction to Hematopoietic Cell Transplantation*

PAST INVITED LECTURERS

2007 – Daniel D. Bikle, M.D., Ph.D.

Professor of Medicine and Dermatology
In residence University of California

- 1) *The skin game: Calcium and vitamin D regulated cellular differentiation*
- 2) *Vitamin D: how much do we need and why*

2006 - Mark E. Shirtliff, Ph.D.

Assistant Professor, Department of Biomedical Sciences
Dental School, University of Maryland-Baltimore
Baltimore, Maryland

- 1) *Staphylococcus aureus biofilms: in vitro and in vivo studies*

2006 - J. William Costerton, Ph.D.

Director & Professor, Center for Biofilms, School of Dentistry
University of Southern California
Los Angeles, California

- 1) *Biofilms in Device-related and other Chronic Bacterial Diseases*

2005 – William F. Balistreri, MD

Director, Gastroenterology
Cincinnati Children's Hospital Medical Center

- 1) *Inborn Errors of Bile Acid Biosynthesis*
- 2) *Viral Hepatitis 2005*

2004 – Joseph S. McLaughlin, MD

Professor Emeritus of Surgery
University of Maryland

- 1) *Traumatic Ruptured Aorta*
- 2) *Strange Tumor I Have Known*

2003 – W. Jackson Pledger, Ph.D.

Professor, Interdisciplinary Oncology
University of South Florida College of Medicine
Tampa, Florida

- 1) *Regulation of proliferation by cyclin dependent kinase*
- 2) *Functional genomics and cancer therapy*

2002 – Alan H. Jobe, M.D., Ph.D.

Professor of Pediatrics
Cincinnati Children's Hospital Medical Center
Cincinnati, Ohio

- 1) *Mechanisms of lung injury in the preterm*
- 2) *Translational research on lung maturation based on clinical observations*

2001 - Arnold Starr, M.D.

Director, Alzheimers' Research Center
Institute Brain Research of California, Irvine

- 1) *Hearing but not understanding: auditory nerve dysfunction in the presence of preserved cochlear receptors*
- 2) *Patients' stories and their seminal importance for research*

PAST INVITED LECTURERS

2000–Fredrick L. Brancati, M.D., M.H.S.

Associate Professor, Medicine and Epidemiology
John Hopkins Medical Institute

- 1) *Novel risk factors for type 2 diabetes mellitus and their implications for treatment*
- 2) *Prevention and clinical epidemiology in the new millennium*

1999 – Robert B. Belshe, MD

Director and Professor, Div. of Infectious Diseases and Immunology
St. Louis University

- 1) *Live attenuated influenza vaccine: using genetics to defeat the flu*
- 2) *Vaccines for the 21st century*

1998 – Jerome S. Brody, MD

Vice-Chairman of Medicine for Research, Professor of Medicine
Director, Pulmonary Center
Boston University School of Medicine

- 1) *Lung development: lesson from flies connections to cancer*
- 2) *Molecular approaches to the diagnosis of lung cancer*

1997 – Rochelle Hirschhorn, MD

Professor of Medicine, Department of Medicine
NYU School of Medicine

- 1) *Advances in defects in host defense*
- 2) *Reflection on the changing face of medicine*

1996 – Stuart F. Schlossman, MD

Baruj Benacerraf Professor of Medicine
Harvard Medical School
Chief, Division of Tumor Immunology
Dana-Barber Cancer Institute, Boston

- 1) *Human T-cell activation*
- 2) *What's in a name – cd nomenclature*

1995 – Frank M. Torti, MPH, MD, FACP

Director, Comprehensive Cancer Center
Professor Charles L. Spurr Professor of Medicine
Section Head for Hematology/Oncology, Wake Forest University
Chairman, Department of Cancer Biology
Bowman Gray School of Medicine

- 1) *New pathways for the regulation of iron*
- 2) *Popeye spinach and iron: the politics*

1994 – Abner Louis Notkins, M.D.B.

Director, Intramural Research Program
Chief, Laboratory of Oral Medicine National Institute of Dental Research,
National Institutes of Health, Bethesda, MD

- 1) *Polyreactive antibody molecules and matter*
- 2) *The Bethesda experiment*

PAST INVITED LECTURERS

1993 – Erling Norrby, MD, Ph.D.

Dean of Research and Professor of Virology
Karolinska Institute, Department of Virology Sweden

- 1) *Immunization against HIV-2/SIV in monkeys*
- 2) *The selection of Nobel Prize winners*

1992 – Simon Karparkin, MD

Professor of Medicine
New York University School of Medicine

- 1) *Role of thrombin, integrins and oncogenes*
- 2) *How scientific discoveries are made*

1991 – Robert M. Chanock, MD

Chief, Laboratory of Infectious Diseases
National Institute of Allergy & Infectious Diseases
National Institutes of Health, Bethesda, MD

- 1) *Epidemiology, pathogenesis, therapy*
- 2) *New approaches to development of treatment plans*

1990 – Dewitt S. Goodman, MD

Director, Institute of Human Nutrition
Director, Arteriosclerosis Research Center
Tiden-Weger-Bieler Professor of Preventative Medicine
Professor of Medicine, Columbia University,
College of Physicians and Surgeons
Director, Division of Metabolism and Nutrition
Department of Medicine
Columbia-Presbyterian Medical Center, New York
Retinoid and retinoid-binding proteins

1989 – Michael A. Zasloff, MD, Ph.D.

Charles E.H. Upham, Profess of Pediatrics
University of Pennsylvania School of Medicine
Chief, Division of Human Genetics & Molecular Biology
The Children's Hospital of Philadelphia

- 1) *The flow of genetic information*
- 2) *Magainin peptides*

2016 RESEARCH DAY CONFERENCE PRESENTATION WINNERS

ORAL BASIC SCIENCE, WINNER

Taha Ahmad

"The Significance of CYP2B6 Genetic Polymorphisms in Unexpected Fatalities of Methadone Users in Caucasians of WV and KY Appalachia Region"

Justin K. Tomblin

"2,3,7,8_tetrachlorodibenzo_p_dioxin (TCDD)/Aryl Hydrocarbon Receptor (AHR) Regulation of Large Neutral Amino Acid Transporter 1 (LAT1) in Breast Cancer Cells"

ORAL CLINICAL SCIENCE, RUNNER-UP

Alexandra Nichols

"Role of Serum Biomarkers in Early Detection of Diabetic Cardiomyopathy in West Virginian Population"

ORAL CLINICAL SCIENCE, WINNER

Mohit Harsh

"Locally Advanced and Invasive Prostate Cancer is More Common in Appalachia: Results of a Single Surgeon over 15 years"

POSTER BASIC SCIENCE, STUDENT

Sean Piwarski

"Exploring the Mechanism by Which 2,3,7,8_tetrachlorodibenzodioxin (TCDD) Regulates Jagged_1 via the Aryl Hydrocarbon Receptor"

POSTER BASIC SCIENCE, POST-DOCTORAL

Krithika Srikanthan

"Heme Oxygenase Induction Suppresses Hepatic Hcpidin and Rescues Ferroportin and Ferritin Expression in Obese Mice"

POSTER CLINICAL SCIENCE, STUDENT

Raj Singh

"Evaluating the Implications of Changes in PSA_Screening Guidelines on Prostate Cancer_Related Mortality, Utility, and Cost: A Decision Analysis Approach"

POSTER CLINICAL SCIENCE, POST-DOCTORAL

Johnson Walker

"An Update on Pediatric All_Terrain Vehicle Trauma: A Two_Decade Statewide Experience"

CLINICAL VIGNETTE, STUDENT

Hilary Cornell

"Interstitial Microduplication of 16p13.3 – A case report"

CLINICAL VIGNETTE, POST-DOCTORAL

Elise Anderson

"Inhalation drug abuse induced cryptococcal meningococcalencephalitis"

RICHARD J. STEVENS, MD MEMORIAL LECTURE

RESEARCH DAY | INVITED LECTURER

MARCH 24, 2017 at 11:30 AM • HARLESS AUDITORIUM



JULIAN E. BAILES, JR., MD

Neurosurgery Specialist

NorthShore Medical Group, Evanston, IL

"Concussions"

Learning Objectives:

Review mechanisms and treatment of cerebral concussions.

Discuss traumatic brain injuries and their prevention. Review the effects of head injuries on professional athletes.

No Conflicts Indicated

Julian E. Bailes, MD, is the Chairman of the Department of Neurosurgery and Co-Director of the NorthShore Neurological Institute.

Dr. Bailes' expertise is in neurovascular disease. Dr. Bailes is a recognized leader in the field of neurosurgery and the impact of brain injury on brain function. He has been instrumental in the understanding of the clinical evidence of chronic traumatic encephalopathy (CTE), a progressive degenerative disease found in individuals who have been subjected to multiple concussions and other forms of head injury. His laboratory research has focused upon mechanisms and treatment of cerebral concussions. Dr. Bailes also is a founding member and director of the Brain Injury Research Institute, which focuses on the study of traumatic brain injuries and their prevention. Dr. Bailes previously served for 11 years as the Professor and Chairman of the Department of Neurosurgery at West Virginia University School of Medicine where he specialized in the diagnosis and surgical treatment of cerebrovascular disease, stroke, and traumatic brain injury. Since 1994, he has been a neurological consultant to the NFL Players' Association (NFLPA), which has supported research on the effects of head injuries on professional athletes. He is the Medical Director of the Center for Study of Retired Athletes based at the University of North Carolina, Chapel Hill. He has been an advisor to the NCAA and also is the Medical Director for Pop Warner Football, the largest youth sports association in the U.S.

Dr. Bailes has over 170 scientific publications concerning various aspects of neurological surgery, including three books on neurological sports medicine, and performs editorial duties for a number of medical journals. Dr. Bailes has been honored as one of the nation's best surgeons for eight consecutive years in U.S. News & World Report's "America's Best Doctors" and "America's Top Surgeons." In 2014, Dr. Bailes was named "Top Neurosurgeon" by Chicago magazine.

Dr. Bailes was portrayed by actor Alec Baldwin as a leading character in the movie: *Concussion* (Dec. 2016).

List of Presenters' Abstracts

No relevant Conflicts of Interest as supported by Disclosure

Case Study Poster - March 23, 4:00PM-5:30PM

Presenter	Poster	Category	Abstract Page	Presenter	Poster	Category	Abstract Page
Al-Farawi	26	csPoster	103	Krauss	6	csPoster	83
Ali	21	csPoster	98	Lilly	47	csPoster	125
Andrews	11	csPoster	88	MartinA	13	csPoster	90
Aqtash	16	csPoster	93	Mezughi, MD	5	csPoster	82
Bajamundi	43	csPoster	121	Milhem	24	csPoster	101
Barbour	38	csPoster	116	Nijim	20	csPoster	97
Childress	15	csPoster	92	Nijim	23	csPoster	100
Childress	33	csPoster	111	Numan	39	csPoster	117
Collins Hostetter	29	csPoster	106	Patel	18	csPoster	95
Crain	32	csPoster	110	Qiu	14	csPoster	91
Elhamdani	4	csPoster	81	Schindzielorz	2	csPoster	79
Elhamdani	7	csPoster	84	Seemaladinne	42	csPoster	120
Feleke	3	csPoster	80	Shah	10	csPoster	87
Gebrmichael	36	csPoster	114	Singh	8	csPoster	85
Harsh	44	csPoster	122	Stalnaker	28	csPoster	105
Hatcher	35	csPoster	113	Tashani	31	csPoster	109
Haydock	22	csPoster	99	Urian	9	csPoster	86
Haydock	27	csPoster	104	Wilson	45	csPoster	123
Hunt	25	csPoster	102	Worthy	34	csPoster	112
Jafri	12	csPoster	78	Wyner	30	csPoster	108
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Justice	40	csPoster	118				
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Oral Presenters - March 24, 8:30AM-4:15PM

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3:27PM	Aguilar	oral	49
3:39PM	Ahmed	oral	50
10:42AM	Arthur	oral	37
9:18AM	Blanchard	oral	32
10:30AM	Casinelli	oral	36
1:39PM	Hayes	oral	44
	Maldonado		
3:15PM	Iqbal	oral	48
2:03PM	Jafri	oral	46
8:54AM	Kirby	oral	30
9:30AM	Kutz	oral	33
1:51PM	Oliashirazi	oral	45
3:51PM	Oliashirazi	oral	51
11:06AM	Palaniappan	oral	39
8:42AM	Racine	oral	29
11:18AM	Riley	oral	40
1:15PM	Shah-P	oral	42
8:30AM	Sheppard	oral	28
9:06AM	SinghS	oral	31
1:27PM	SinghR	oral	43
10:54AM	Stevens	oral	38

List of Presenters' Abstracts

No relevant Conflicts of Interest as supported by Disclosure

Basic Science Poster - March 24, 9:45AM-10:30AM

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Ahmar	18	bsPoster	71	Piwarski	19	bsPoster	72
Allred	8	bsPoster	61	Sayan	2	bsPoster	55
Amos	10	bsPoster	63	Schade & Sanabria	9	bsPoster	62
DavisA	12	bsPoster	65	Seidler	14	bsPoster	67
Friedman	3	bsPoster	56	Sharma	13	bsPoster	66
Getty	6	bsPoster	59	Ward	5	bsPoster	58
Hossain	16	bsPoster	69	Wright	7	bsPoster	60
Keding	11	bsPoster	64	Yan	22	bsPoster	75
Mallick	15	bsPoster	68	Zill	23	bsPoster	76
Martin	20	bsPoster	73				
Martin	21	bsPoster	74				
Murphy	1	bsPoster	54				
Nawab	17	bsPoster	70				
Parkman	4	bsPoster	57				

Clinical Science Poster - March 24, 2:30PM-3:15PM

Presenter	Poster	Category	Abstract Page	Presenter	Poster	Category	Abstract Page
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Ahmed	46	clinPoster	173	Millard	22	clinPoster	149
Andrews	48	clinPoster	175	Modarresi	17	clinPoster	144
Aqtash	38	clinPoster	165	Modarresi	39	clinPoster	166
Aqtash	41	clinPoster	168	Nellhaus	31	clinPoster	158
Arguelles	45	clinPoster	172	Oliashirazi	18	clinPoster	145
Bai	13	clinPoster	140	Pacor	14	clinPoster	141
Balfaqih	7	clinPoster	134	Qiu	15	clinPoster	142
Barry	25	clinPoster	152	Ranavaya	40	clinPoster	167
Carico	36	clinPoster	163	SharmaBlackwell	20	clinPoster	147
Cecchetti	44	clinPoster	171	Shaver	34	clinPoster	161
Creel	28	clinPoster	155	Urella	47	clinPoster	174
DavisH	33	clinPoster	160	Vaughan	1	clinPoster	128
Dayo	24	clinPoster	151	Wellman	6	clinPoster	133
DeMoss	42	clinPoster	169	Worthy	11	clinPoster	138
Dinsmore	12	clinPoster	139	Yasuda	26	clinPoster	153
Edwards	19	clinPoster	146				
Fares	35	clinPoster	162				
FarleyBlackwood	8	clinPoster	135				
Fetty	29	clinPoster	156				
Flaugher	37	clinPoster	164				
Floyd	32	clinPoster	159				
Gray	3	clinPoster	130				
Hardman	9	clinPoster	136				
Hart	4	clinPoster	131				
Hensley	30	clinPoster	157				
Hicks	10	clinPoster	137				
Klaus	2	clinPoster	129				
Klug	23	clinPoster	150				
Klug	43	clinPoster	170				
Lee	5	clinPoster	132				
MayEspirdion	21	clinPoster	148				

RESEARCH DAY AGENDA

MARCH 24, 2017

Specific learning objectives will be presented with each oral presentation.

Questions and answers encouraged throughout all sessions.

No apparent speaker conflicts indicated as supported by disclosure.

7:00AM	Registration	AM & PM registration required
8:15AM	Welcome	Jerome A. Gilbert, PhD, President, Marshall University
8:20AM	Opening Remarks	Uma Sundaram, MD, Vice Dean and Research Day Chair

Oral Session I		Abstracts Page 27	
Time	Format	Presentation Order	Name/ Abstract Title /Department
8:30AM	Oral	1	Jordan G. Sheppard <i>Allicin-Inspired Pyridyl Disulfides as Anti-MRSA Antibiotics</i> <i>Pharmaceutical Science and Research</i>
8:42AM	Oral	2	Holly L Racine <i>Blocking IGF1 Activity in Skeletal Growth Plates Reduces Limb Lengthening Effects of Temperature in Growing Mice</i> <i>Biomedical Sciences</i>
8:54AM	Oral	3	Brandon Kirby <i>Comparison of Tobramycin vs. Rifaximin Aerosol Therapy Efficacy for Treatment of Acute Pseudomonas aeruginosa Pneumonia in Mice.</i> <i>Microbiology/Biochemistry</i>
9:06AM	Oral	4	Soudamani Singh <i>Differential expression of Na-glutamine co-transporters SN2 and B0AT1 in mammalian intestinal crypt-to-villus cell maturation.</i> <i>Dept. of Clinical & Translational Sciences and Appalachian Clinical and Translational Science</i>
9:18AM	Oral	5	Neil Blanchard <i>"Integrin $\beta 5$ Expression in Human Pulmonary Microvascular Endothelial Cells, and its Contribution to the Arterial Remodeling in Pulmonary Hypertension"</i> <i>Internal Medicine</i>
9:30AM	Oral	6	Laura C Kutz <i>Isoform-Specific Role of Na/K-ATPase $\alpha 1$ in Skeletal Muscle Growth and Performance</i> <i>Marshall Institute for Interdisciplinary Research</i>
9:45AM	BREAK	Basic Science Poster Session 1 - Atrium	Abstracts Page 53

RESEARCH DAY AGENDA

Oral Session 2

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10:30AM	Oral	7	Gabriella Casinelli <i>N-myc overexpression increases cisplatin resistance in neuroblastoma via deregulation of mitochondrial dynamics</i> <i>Oncology</i>
10:42AM	Oral	8	Subha Arthur <i>Regulation of intestinal villus cell brush border membrane bile acid co-transport in obesity</i> <i>Clinical and Translational Sciences</i>
10:54AM	Oral	9	Sarah Stevens <i>Role of Interleukin-1 Receptor (IL-1R) in a Mouse Model of Incisional Pain</i> <i>Pharmaceutical Science and Research</i>
11:06AM	Oral	10	Balasubramanian Palaniappan <i>Unique mechanism of NaCl absorption in obese Zucker rats – uncoupling of traditional brush border membrane neutral NaCl absorption in intestinal epithelial cells.</i> <i>Department of Clinical and Translational Sciences</i>
11:18AM	Oral	11	Brittany Riley <i>Polypharmacy among West Virginia Medicaid beneficiaries: prevalence, utilization, cost, and potential geographical disparities</i> <i>Pharmacy Practice, Administration and Research</i>
11:30AM		KEYNOTE	Julian E. Bailes, MD (See Page 11) <i>Concussions</i> <i>Neurosurgery Specialist NorthShore Medical Group, Evanston, IL</i> No Conflicts

12:40PM BOX LUNCH

Oral Session 3

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1:15PM	Oral	12	Preeya Shah <i>A Novel Method of Determining Adiposity and Its Relationship with Blood Pressure in the Modification of Diet in Renal Disease Study</i> <i>Internal Medicine</i>
1:27PM	Oral	13	Raj Singh <i>A Retrospective Examination of the Effectiveness of Lower Doses of Filgrastim in Achieving an Adequate Immune Response in Cancer Patients</i> <i>Internal Medicine</i>

RESEARCH DAY AGENDA

1:39PM	Oral	14	Rebecca Hayes / Dylan Maldonado Development and Validation of a Step Test of Aerobic Fitness in Young Children <i>Pediatrics</i>
1:51PM	Oral	15	Ali Oliashirazi How to Manage Persistent Draining Wounds after Total Joint Arthroplasty <i>Orthopaedic surgery</i>
2:03PM	Oral	16	Hassaan Jafri MD Incidence and Survival of patients with Multiple Myeloma with Prior Diagnoses of Myeloproliferative Disorders <i>Internal Medicine</i>

SPECIAL: March 23 Only SPECIAL VIEWING Poster Session 2 - Case Study
 Thursday, March 23, 4:00PM-5:30PM Abstracts Page 77
 Posters will not be available for viewing on Friday, March 24

2:30PM	BREAK	Clinical Science Poster Session 3, Atrium Page 127	
Oral Session 4		Abstracts Page 47	
3:15PM	Oral	17	Naveed S. Iqbal Incremental Risk Stratification in Stable Patients Undergoing Elective Cardiac Catheterization with Cardiac Biomarker Score <i>Cardiovascular Medicine</i>
3:27PM	Oral	18	Rodrigo Aguilar Patient Satisfaction for Orthopaedic Department in Cabell Huntington Hospital <i>Orthopaedics</i>
3:39PM	Oral	19	Waseem Ahmed The Influence of Cirrhosis and Fatty Liver on Survival in Septic Shock <i>Internal Medicine</i>
3:51PM	Oral	20	Ali Oliashirazi What Are the Risk Factors of Persistent Wound Drainage after Total Hip and Knee Arthroplasty? <i>Orthopaedic Surgery</i>
4:10PM	Marshall Journal of Medicine Overview		Darshana Shah, PhD, Associate Dean Faculty Affairs & Development, Professor, Department of Pathology - Harless Auditorium
4:30PM	Winners Presentation		Harless Auditorium

RESEARCH DAY AGENDA

9:45AM-10:30AM BASIC SCIENCE POSTER PRESENTATIONS SESSION 1 - ATRIUM - Page 53

- No. Name/**Abstract**/Department
- 1 Rachel A. Murphy
Anti-Viral Agent Tenofovir Causes Mitochondrial Damage and Oxidative Stress in HK-2 Cells
Pharmacology, Physiology, and Toxicology
 - 2 Dr. Ardalan Sayan
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- 6 Courtney Wellman
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- 7 Yaslam Balfaqih
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- 12 Travis Dinsmore
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- 13 Fang Bai
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- 14 Justin Pacor
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- 15 Xiaoliang Qiu
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- 16 Rodrigo Aguilar
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- 19 Rachel Edwards
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- 24 Mayowa Dayo
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- 25 Dr. Rahman Barry
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- 26 Sashi Yasuda
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- 27 "Brandon Merritt, Stacey Lewis"
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- 30 Christina Hensley
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- 31 Emma M. Nellhaus
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- 32 Brett Floyd
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- 33 Harley Davis
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- 34 Karl Shaver
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- 38 Obadah Aqtash
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- 44 Alfred A Cecchetti
Utilization of Appalachian Clinical and Translational Science Institute Data Warehouse to more accurately predict disease processes important for central Appalachia.
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- 45 Eric Arguelles
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- 47 Madhulika Urella
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ORAL SESSION I • 8:30 AM – 9:45 AM

29TH ANNUAL RESEARCH DAY ORAL SESSION

Allicin-Inspired Pyridyl Disulfides as Anti-MRSA Antibiotics

Jordan G. Sheppard, Jeremy P. McAleer, Timothy E. Long

Pharmaceutical Science and Research, Marshall University

Background

Alliin, a natural thiosulfinate found in garlic (*Allium sativum*), has been investigated for an extensive range of medicinal applications including the treatment of bacterial infections. Despite owning potent in vitro activity against medically-relevant bacterial pathogens, the viability of alliin for treating systemic infections is marred by its chemical instability. To this end, a number of organosulfur derivatives have been evaluated as alternatives to alliin. Here we report on the structure activity relationship (SAR) and pharmacological properties of novel, alliin-like S-(alkylthio)-2-pyridine disulfides as antibacterial agents.

Hypothesis

Synthetic S-(alkylthio)-2-pyridine disulfides will mirror the narrow spectrum antimicrobial activity profile of alliin by functioning as depolarizing agents of the bacterial plasma membrane.

Methods

Classical methods in organic chemistry was used to synthesize the disulfides for microbiological evaluation. Compounds were tested for antibacterial activity against a characterized panel of Gram-positive and Gram-negative human pathogens. Disulfides with minimum inhibitory activity (MIC) of less than 1 mcg/mL were evaluated as inhibitors of the bacterial membrane potential by flow cytometry using drug-treated cells stained with DiOC2(3).

Results

S-(Alkylthio)-2-pyridine disulfides were found to be narrow spectrum antibiotics against Gram-positive bacteria including methicillin-resistant *Staphylococcus aureus* (MRSA) and *Bacillus anthracis* (anthrax). S-Octyl pyridyl disulfide was identified as the lead compound for pharmacological study based on its superior sub-mcg inhibitory activity against MRSA. Flow cytometry resolved that the inhibitory effects on growth by the antibiotics can be partially attributed to depolarization of the plasma membrane.

Conclusion

S-(Alkylthio)-2-pyridine disulfides were found to be potent growth inhibitors of Gram-positive bacteria. S-Octyl pyridyl disulfide demonstrated comparable in vitro efficacy to vancomycin against MRSA by serving as an antagonist of the plasma membrane potential. Future investigations will focus on lead optimization studies and elucidating additional mechanisms of action at the cytosolic level.

Blocking IGF1 Activity in Skeletal Growth Plates Reduces Limb Lengthening Effects of Temperature in Growing Mice

HL Racine, CA Meadows, G Ion, MA Serrat

Department of Biomedical Sciences, Joan C. Edwards School of Medicine,
Huntington, WV

Background

Limb length inequality in children can lead to conditions such as scoliosis, back pain and osteoarthritis. Research in our lab is focused on noninvasive strategies for modulating limb lengthening. Bone elongation is regulated by local and systemic growth factors, which can be altered by temperature. We developed a model of targeted heat exposure that we successfully used to increase tibial elongation rate by over 12% in the heat-treated limb.

Hypothesis

Heat exposure augments actions of insulin-like growth factor 1 (IGF1) in the growth plate to enhance bone length since limb elongation is IGF1 dependent.

Methods

We coupled our limb-heating model with an IGF1 peptide analog (JB1, Sigma) that blocks downstream activity of IGF1. Each morning for 7 days, 3-week old female C57BL/6 mice (N=6 per group) were injected with saline, IGF1 (2.5mg/kg SQ), or the IGF1 blocking drug JB1 (2.5mg/kg) one-hour prior to targeted heat-treatment (40C for 40 min/day). Proximal tibial growth plates and femora were collected. Immunohistochemical staining for phosphorylated Akt (pAkt) was used to assess IGF1 signal activation.

Results

Heat-treated femora in both saline and IGF1-injected groups were nearly 1.7% longer than their non-treated contralateral side. There were no significant left-right differences in femoral length in the JB1 group ($p=0.8$). Histological analyses revealed that JB1-injected mice had significantly shorter growth plates than either saline or IGF1-injected mice. Immunostaining showed a trend of increased pAkt expression on the heat-treated sides of saline and IGF1 groups, suggesting an IGF1-driven increase in growth rate. This growth acceleration was blocked in mice that received JB1.

Conclusion

Blocking IGF1 activity in the proximal tibial growth plate attenuates the bone lengthening effects of temperature in hindlimbs of growing mice. Results are relevant for elucidating mechanisms of heat-enhanced bone elongation and for developing strategies to combat a range of limb lengthening disorders.

Comparison of Tobramycin vs. Rifaximin Aerosol Therapy Efficacy for Treatment of Acute *Pseudomonas aeruginosa* Pneumonia in Mice.

Brandon Kirby, Monica Valentovic, and Hongwei Yu

Department of Biomedical Sciences, Marshall University Joan C Edwards School of Medicine

Background

Pseudomonas aeruginosa is a gram-negative opportunistic bacterial pathogen. The ability to produce biofilms contributes to virulence. Cystic fibrosis patients are most vulnerable with robust mucus production, a perfect environment for biofilm formation. The current treatment is inhaled tobramycin. However, studies suggest tobramycin lacks the properties to inhibit biofilm formation. Using an NIH drug library, rifaximin was found to exhibit properties that may inhibit biofilm formation.

Hypothesis

The objective of this study is to test rifaximin vs tobramycin efficacy using a lung infection mouse model for *P. aeruginosa*. The hypothesis is rifaximin will outperform tobramycin.

Methods

To test, four groups of C57BL/6 mice were nebulized with 100 mg or 400 mg tobramycin in 0.225% saline, and 100 mg or 400 mg rifaximin in DMSO to determine drug concentrations in the lung. DBA/2 mice were infected with *P. aeruginosa* and treated with 300 mg rifaximin or tobramycin delivered via nebulization. Seven groups were divided as follows: control with no treatment, immediate rifaximin or tobramycin treatment, 6-hour post infection treatment, and 12-hour post infection treatment.

Results

Results indicate concentrations of 3 µg of drugs is in the lung after 100 mg nebulizations, however 15 µg of tobramycin and 8 µg of rifaximin is in the lung after 400 mg nebulizations. All infected mice without treatment die after 120 hours while 83% treated with tobramycin immediately survived, 50% treated at six hours survived, and 67% treated at 12 hours survived; however, 100% of mice treated with rifaximin immediately survived, 92% treated at 6 hours survived, and 83% treated at 12 hours survived.

Conclusion

In conclusion, tobramycin may be better absorbed in the lung at higher dosages but more mice survived with treatment of *P. aeruginosa* infections using rifaximin. Further studies will be conducted looking at pharmacological properties of these drugs to determine if rifaximin is a better candidate.

Differential expression of Na-glutamine co-transporters SN2 and B0AT1 in mammalian intestinal crypt-to-villus cell maturation.

Soudamani Singh, Niraj Nepal, Molly R Butts, Travis Parkulo, Subha Arthur, and Uma Sundaram.

Dept. of Clinical & Translational Sciences, Joan C. Edwards School of Medicine, Marshall University

Background

Glutamine is the primary nutrient for enterocytes and is assimilated via Na-dependent glutamine co-transport (NGcT) on the brush border membrane (BBM) by SN2/SLC38A5 in crypts and by B0AT1/SLC6A19 in villus cells. Na-K-ATPase activity also approximately doubles during crypt-to-villus maturation. However, how SN2 NGcT transitions to B0AT1 during differentiation of intestinal cells is not known.

Hypothesis

Hypothesis: Crypt-to-villus maturation alters expression of Na-glutamine co-transporters. Aim: Determine mechanisms involved in transition of SN2 to B0AT1 during crypt-to-villus maturation.

Methods

Methods: To study crypt-to-villus maturation in vitro, the rat intestinal epithelial cell line, IEC-18, was used. Li-dependent 3H-glutamine uptake was used to measure SN2 activity and Na-dependent 3H-glutamine uptake was utilized for B0AT1 activity. Western blots were performed analyzing SN2 and B0AT1 levels.

Results

Results: Functionally, SN2 is primarily active at day 0-1 and decreases by day 4 post-confluence (357±14 pmol/mg protein/2 min in 0-1 day to 157±4.9 on day 4), while B0AT1 is most active at day 4 (1169±17 pmol/mg protein/2 min in 0-1 day and 2174.0 ± 73 at day 4). These are comparable to our rabbit crypt and villus cell BBM vesicle uptakes (36.3±1.8 pmol/mg protein crypt and 107±3 in villus cell BBMV). Na-K-ATPase activity also increases from 0-1 to 4 days post-confluence (5.1±0.1 to 13.3±0.1 nmol/mg protein/min). BBM expression and total protein expression of SN2 decreased from 0-1 day to day 4 post-confluence. In contrast, BBM expression and total protein expression of B0AT1 increased, reaching maximal expression by day 4 post-confluence.

Conclusion

Conclusions: These data reveal as intestinal cells mature from crypt to villus, glutamine is differentially assimilated by unique pathways: SN2 in undifferentiated cells, B0AT1 in differentiated cells. Further, these data suggest two levels of control of SN2 and B0AT1 as crypt cells mature to villus cells, both at the synthesis as well as the level of trafficking to the BBM.

Integrin $\beta 5$ Expression in Human Pulmonary Microvascular Endothelial Cells, and its Contribution to the Arterial Remodeling in Pulmonary Hypertension

Neil Blanchard, Daniela Farkas, Carlyne D. Cool, and Laszlo Farkas

Division of Pulmonary Disease and Critical Care Medicine, Department of Internal Medicine, Virginia Commonwealth University, Richmond, VA; Marshall University School of Medicine, Huntington, WV

Background

Pulmonary Hypertension (PH) is a disorder that involves extensive changes to vasculature of the lungs, particularly the arterial endothelium. In PH, endothelial-to-mesenchymal transition (EnMT) occurs in concert with the cell's interaction with the extracellular matrix.

Hypothesis

The Integrin transmembrane receptor family mediates extracellular interactions throughout the body, and we hypothesized that Integrin- $\beta 5$ is an important mediator of EnMT in the altered endothelium in PH.

Methods

My part in the study was investigating integrin $\beta 5$'s role in endothelial cell survival and EnMT in PH. Human pulmonary microvascular endothelial cells (hPMVEC) were treated with transforming growth factor $\beta 1$ (TGF- $\beta 1$) to induce EnMT, and populations of these cells were treated with differing concentrations of a neutralizing antibody for integrin $\alpha v\beta 5$. The cells were evaluated for apoptosis (annexin V), proliferation (BrdU incorporation assay), gene expression (quantitative real-time PCR), and migration ("scratch" migration assay).

Results

Increasing concentrations of integrin- $\alpha v\beta 5$ antibody caused an increase in apoptotic hPMVECs. BrdU incorporation analysis showed no significant change in cell proliferation between the groups. PCR analysis revealed that the hPMVEC underwent EnMT in response to TGF- $\beta 1$; these cells demonstrated a reduction of endothelial cell markers PECAM1 and VCAM1, as well as an increase in EnMT transcription factor SNAI1, and an increase in mesenchymal marker ACTA2. Antibody blockade of integrin- $\alpha v\beta 5$ halted the increase in mesenchymal marker ACTA2, but was not able to regain expression of endothelial cell markers PECAM, VWF, or VCAM. This may be related to persistent increases in expression of the transition cell markers Snai1 and Snai2. Finally, the TGF- $\beta 1$ group showed reduced wound closure, and the scratch assay demonstrated a further decline in closure for the integrin $\alpha v\beta 5$ groups.

Conclusion

The results complement previous data that suggests integrin- $\beta 5$ contributes to EnMT in hPMVEC. Whether integrin- $\beta 5$ is a potential target for therapy in PH is under investigation in preclinical in vivo studies.

Isoform-Specific Role of Na/K-ATPase α 1 in Skeletal Muscle Growth and Performance

Laura Kutz, Shreya Mukherji, Pauline Marck, Xiaoyu Cui, Sandrine Pierre, and Zijian Xie

Marshall Institute of Interdisciplinary Research, Marshall University, Huntington, WV

Background

The Na/K-ATPase is vital for maintaining the membrane potential in excitable tissues such as skeletal muscle. Additionally, recently published data from our lab revealed a role for the α 1 but not α 2 isoform in regulating cell growth in vitro. The importance of this isoform-specific signaling in vivo is still unclear. This issue was investigated in skeletal muscle, which expresses both isoforms.

Hypothesis

We tested whether deletion of Na/K-ATPase α 1, representing 13% of total skeletal muscle Na/K-ATPase pool, would impact muscle size and performance.

Methods

We used the MyoDiCre-lox system to excise exons 15-18 of the ATPA1 gene exclusively in skeletal muscle. PCR analysis confirmed deletion of ATP1A1 in skeletal muscle but not reference tissues. Western blot analysis was used to assess expression of α 1 and α 2 in whole tissue. Twelve week old skeletal muscle-specific α 1 knockout (ska1-KO) mice and controls were subjected to a treadmill exercise testing protocol. Running was encouraged with a shock grid on the platform, and tolerance of high speeds was assessed by increasing speed by 2m/min stepwise up to 25m/min. To measure endurance, speed was maintained at 25m/min and distance at fatigue was recorded.

Results

As expected, expression of α 1 in ska1-KO muscles was minimal (relative expression 1.00 ± 0.11 vs 0.15 ± 0.04 , $p < 0.0001$, $n = 8-10$), while α 2 expression was unaltered. The mass of the gastrocnemius muscle was decreased by 41% in 16 week old ska1-KO mice. All mice ran normally at all tested speeds, but distance to fatigue decreased by 56% in ska1-KO mice.

Conclusion

These data suggest unique roles for Na/K-ATPase α 1 isoform in skeletal muscle growth for which the α 2 isoform does not compensate. The skeletal muscle specific α 1 knockout mouse described here will be used in future studies to elucidate the distinct roles of the pumping and signaling functions of α 1 and the mechanism of these physiological changes.





ORAL SESSION II • 10:30 AM – 11:30 AM

29TH ANNUAL RESEARCH DAY ORAL SESSION

N-myc overexpression increases cisplatin resistance in neuroblastoma via deregulation of mitochondrial dynamics

Gabriella Casinelli, Jeff LaRosa, Manika Sharma, Edward Cherok, Swati Banerjee, Lia Edmunds, Yudong Wang and J Anthony Graves
Oncology Department, Children's Hospital of Pittsburgh of UPMC

Background

Neuroblastoma accounts for 7% of malignancies from birth to 14 years of age and 12% of cancer deaths in children. An important factor in defining high-risk disease is amplification of the N-MYC gene. The N-MYC gene has been estimated to be amplified in 15-25% of neuroblastomas. The N-MYC gene product N-myc is a global transcription factor that regulates genes involved in growth and proliferation.

Hypothesis

The over expression of N-myc would deregulate mitochondrial biogenesis.

Methods

The neuroblastoma cell line SK-N-SH (SH) which expresses normal levels of N-myc was used as a control. The SH cell line was transfected with an N-MYC gene construct to show over expression (SH-N-Myc). Mitochondrial fusion, mass, membrane potential and DNA content were measured. Western blots, oxygen consumption, and ATP assays were completed. SH and SH-N-Myc cells were exposed to cisplatin and serum withdrawal to induce apoptosis.

Results

We found that N-Myc overexpression leads to increased fusion of the mitochondrial reticulum secondary to changes in protein expression due to atypical transcriptional and post-translational regulation. Specifically, we found that N-Myc overexpressing cells are resistant to programmed cell death in response to exposure to low doses of cisplatin, and demonstrated that this was dependent on increased mitochondrial fusion.

Conclusion

SH-N-Myc cells had increased mitochondrial biogenesis when compared with SH cells by a number of quantifiable measures: a 4-fold increase in mitochondrial biomass, a 2.5-fold increase in mitochondrial DNA copy number and increased elongation and branching of the mitochondria. Increased mitochondrial biogenesis may provide a transformed cell with a growth advantage by increasing its OXPHOS capacity in order to produce the ATP required for increased growth and proliferation and/or providing the necessary machinery to meet the increased demands of amino acid and nucleotide synthesis at the expense of OXPHOS.

Regulation of intestinal villus cell brush border membrane bile acid co-transport in obesity

Subha Arthur, Ibrahim A Mohammed, Balasubramanian Palaniappan and Uma Sundaram

Department of Clinical Translational Science, Appalachian Clinical and Translational Science Institute, Joan C. Edwards School of Medicine, Marshall University

Background

Altered lipid homeostasis causes many of the morbidities of obesity. However, how intestinal bile acid (BA) absorption, perhaps the most important component of lipid homeostasis, may be altered during obesity is poorly understood. Intestinal lipid absorption requires BAs which are reabsorbed in the mammalian terminal ileum via Na-dependent BA co-transport (ASBT/SLC10A2) on the brush border membrane (BBM) of villus cells. Inhibition of ASBT activity has been shown to reduce lipid and lipid soluble vitamin absorption resulting in malnutrition. However, while lipid absorption has shown to be increased in obesity, how ASBT may be altered is not known.

Hypothesis

ASBT is altered during obesity.

Methods

Distal ileal enterocytes from obese (OZR) and lean (LZR) Zucker rats were isolated by Ca^{++} chelation technique. BBM Na-dependent 3H-taurocholate uptake was performed to determine ASBT activity. Na/K-ATPase activity was determined as inorganic phosphate release.

Results

BBM Na-BA co-transport from OZR was significantly increased compared to that from LZR. Since Na/K-ATPase affects ASBT function at the intact cell level, it was measured and interestingly, found to be reduced. ASBT protein expression was increased 3 fold in the BBM of the intestinal cells from OZR. There was also a 3-fold increase in ASBT expression in protein preparations from whole intestinal cell lysates from OZR, suggesting ASBT stimulation likely to be secondary to increased transcription of the protein. The levels of BA activated transcription factor, farnesoid-X-receptor, known to increase ASBT gene expression, was also increased 2 fold in OZR.

Conclusion

Na-bile acid co-transport increase in obesity is not secondary to altered Na-extruding capacity of villus cells. The mechanism of stimulation of ASBT during obesity is likely secondary to increased synthesis of the BBM co-transporter. Better understanding of the regulation of BA absorption which directly affects lipid absorption may result in novel and efficacious treatment modalities for obesity.

Role of Interleukin-1 Receptor (IL-1R) in a Mouse Model of Incisional Pain

Sarah Stevens, Hayden Isaacs, Hannah Claar, Shekher Mohan, Ph.D.

Department of Pharmaceutical Science and Research, Marshall University, School of Pharmacy

Background

Opioids are commonly prescribed for pain, in 2012, 259 million prescriptions for opioid pain medications were written (CDC.org). Most people who are prescribed opioid pain relievers take them due to a genuine medical needs, e.g. post-op. pain. Patients can experience tolerance and loss of effectiveness of opioids over time and this may have contributed to the current opioid addiction epidemic. Interleukin-1 β (IL-1 β) plays a major role in host defense and inflammation and is associated with inflammation, opioid analgesia and pain sensitivity. The aim of this study was to determine the role of IL-R1, the receptor activated by IL-1 β in morphine tolerance using a mice model of incisional pain.

Hypothesis

Deletion of the IL-R1 receptor will alleviate pain and decrease the incidence of opioid-induced hyperalgesia.

Methods

WT and IL-R1 $^{-/-}$ C57BL/6 mice (n=5/trt., group) were subjected to a 0.5mm incision on the right hind-paw and were administered morphine (10mg/kg, s.c.) or saline daily from post-op., day 0 to 3. During the post-op days, nociception was assessed by recording the paw-withdrawal latency (PWL) (sec.) in response to thermal stimuli, mechanical stimuli and motor coordination measured using a rotarod assay.

Results

Compared to WT mice treated with morphine, IL-R1 $^{-/-}$ mice showed greater PWL times in response to heat and mechanical stimuli. A similar trend was also recorded when mice were placed onto the rotarod to measure coordination. IL-R1 $^{-/-}$ mice demonstrated greater motor coordination and latency to fall times compared to WT mice when measured by rotarod assessment.

Conclusion

This study suggests that IL-1 β and its cognate receptor might be involved in incisional pain and may be a potential therapeutic for the treatment of acute inflammatory pain. Further studies are being conducted to determine the role of IL-R1 in morphine tolerance.

Unique mechanism of NaCl absorption in obese Zucker rats – uncoupling of traditional brush border membrane neutral NaCl absorption in intestinal epithelial cells.

Balasubramanian Palaniappan, Subha Arthur, Soudamani Singh and Uma Sundaram

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Background

Obesity, diabetes and hypertension commonly coexist. Glucose homeostasis is critical for diabetes while Na homeostasis is central to hypertension. Obese Zucker rats (OZR) is an excellent model of obesity, insulin resistance, glucose intolerance and hypertension. In intestinal epithelial cells, coupled NaCl absorption occurs via the dual operation of Na⁺/H⁺ and Cl⁻/HCO₃⁻ exchange (NHE3 and DRA) on brush border membrane (BBM) and glucose is primarily absorbed via Na-glucose co-transport (SGLT1). Intracellular Na homeostasis and trans-cellular Na gradients are maintained by basolateral membrane (BLM) Na⁺/K⁺-ATPase. Previous in vitro studies showed that direct inhibition of Na⁺/K⁺-ATPase resulted in the uncoupling of traditional BBM neutral NaCl absorption and coupling of BBM SGLT1 and DRA in intestinal epithelial cells.

Hypothesis

In a model of obesity associated diabetes and hypertension, inhibition of BLM Na⁺/K⁺-ATPase will uniquely regulate the BBM coupled NaCl absorption in enterocytes.

Methods

OZR were used as an obesity model and Lean (LZR) as control. Their enterocytes were isolated and brush border membrane vesicles (BBMV) were prepared. Na⁺/K⁺-ATPase activity was determined as inorganic phosphate release. ²²Na uptake for NHE3, ³⁶Cl uptake for DRA and ³H-OMG uptake for SGLT1 were performed in BBMV.

Results

Na⁺/K⁺-ATPase was inhibited in OZR. BBM NHE3 activity was unaltered. However, despite the inhibition of Na⁺/K⁺-ATPase, SGLT1 was stimulated. Likewise, DRA was also stimulated. Western blot studies demonstrated unaltered BBM immunoreactive protein levels of SGLT1. However, DRA protein levels was increased.

Conclusion

In obese Zucker rats, inhibition of BLM Na⁺/K⁺-ATPase uniquely regulates BBM Na absorptive pathways. While SGLT1 was stimulated, NHE3 was unaffected. Further, DRA was increased in the BBM. Thus, inhibition of Na⁺/K⁺-ATPase during obesity results in the uncoupling of traditional BBM neutral NaCl absorption and couples the influx between BBM SGLT1 and DRA. These results provide insight into altered Na and glucose homeostasis known to be present in obesity associated diabetes and hypertension.

Polypharmacy among West Virginia Medicaid beneficiaries: prevalence, utilization, cost, and potential geographical disparities

Xue Feng, Tianyu Zheng, Brittany Riley, Xi Tan

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Background

Polypharmacy has not been well studied in the non-elderly population. The proposed study aims to estimate the prevalence of polypharmacy by integrating the definitions used in the literature and establishing a feasible approach for assessing this issue in a non-elderly population using administrative claims data.

Hypothesis

N/A

Methods

In this cross-sectional study, we analyzed the 2010 West Virginia Medicaid claims data for adults aged 18-64. We defined polypharmacy as simultaneous use of drugs from five or more different drug classes for at least 60 consecutive days in one year. Multilevel logistic regression was used to explore the individual- and county-level factors associated with polypharmacy. The associations of polypharmacy with healthcare utilizations were evaluated using zero-inflated negative binomial models. The impact of polypharmacy on non-drug medical costs was assessed using a generalized linear model. We also applied univariate local indicators of spatial association (LISA) to study spatial patterns of polypharmacy prevalence in WV.

Results

The prevalence of polypharmacy as we defined it was 10.5% in WV. We also identified high-high clusters of polypharmacy in southwestern WV, which indicated that a county with an above-average polypharmacy rate was surrounded by counties with above-average polypharmacy rate. Polypharmacy rates were over 35% in patients with congestive heart failure and chronic kidney disease. Being female, being older, having both physical and mental conditions, receiving cash assistance, and living in a county with a distressed economy were positively associated with polypharmacy. Polypharmacy was associated with more hospitalizations, emergency department visits, and outpatient visits, and with higher non-drug medical costs.

Conclusion

Given the high prevalence of polypharmacy and its significant economic burden, particularly in southwestern WV, targeted programs are warranted to identify high-risk populations and help local communities to develop strategies to improve medication use and reduce polypharmacy burden.



ORAL SESSION III • 1:15 PM – 2:30 PM

**29TH ANNUAL
RESEARCH DAY
ORAL SESSION**

A Novel Method of Determining Adiposity and Its Relationship with Blood Pressure in the Modification of Diet in Renal Disease Study

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Department of Internal Medicine, Joan C. Edwards School of Medicine at Marshall University, Huntington, WV

Background

Obesity is a known risk factor for hypertension and other diseases. The Body Mass Index (BMI, kg/m^2) is the most commonly used method of assessing obesity, yet this approach does not directly measure the quantity of fat. Because urinary creatinine excretion (UCrV) is believed to be a marker of skeletal muscle mass, we hypothesized that a ratio of BMI to UCrV (BMI/UCrV) might provide a better index of adiposity. Specifically, we developed this ratio to attempt to emphasize non-muscular body size by normalizing for UCrV.

Hypothesis

We hypothesized that a ratio of BMI to UCrV (BMI/UCrV) might provide a better index of adiposity. We next chose to examine whether this ratio might correlate more strongly with systolic, diastolic, and pulse pressure within participants of the Modification of Diet in Renal Disease (MDRD) Study.

Methods

We used data from the Modification of Diet in Renal Disease (MDRD) Study as urinary creatinine collections and blood pressure measurements were readily available in this data set. A retrospective analysis of the MDRD data identified 840 unique patients ages 19-71. Data was extracted and imported into R studio. Regression analysis between recorded components of blood pressure (systolic, diastolic, and pulse pressure) and the BMI/UCrV ratio was executed. All significance levels are reported at NS, $p < 0.05$ and $p < 0.01$ levels.

Results

We found that the BMI/UCrV ratio correlated significantly with systolic ($p < 0.0181$), diastolic ($p < 0.0229$) and pulse pressure ($p < 0.0580$) in this population. Our data show that although systolic and diastolic blood pressure was predicted similarly by BMI/UCrV ratio and BMI, BMI/UCrV ratio predicted pulse pressure better than either BMI or UCrV alone.

Conclusion

Our data suggest that the ratio of BMI to UCrV is a better predictor of pulse pressure than either systolic or diastolic blood pressures and underscores the importance of adiposity in the pathogenesis of human cardiovascular disease.

A Retrospective Examination of the Effectiveness of Lower Doses of Filgrastim in Achieving an Adequate Immune Response in Cancer Patients

Raj Singh, Henry Heisey, Ahmed Elsayed, Maria Tirona

Department of Internal Medicine, Joan C. Edwards School of Medicine, Marshall University, Huntington, WV

Background

Filgrastim is commonly used to prevent infection in immunocompromised cancer patients. Package inserts indicate that filgrastim should be dosed at 5 mcG/kg, though many oncologists prescribe 300 mcG/mL of filgrastim regardless of patient weight.

Hypothesis

We hypothesized that lower doses of filgrastim are as successful at both increasing neutrophil counts and reducing infection-related complications in patients with higher weights (> 60 kg) as compared to those with lower weights.

Methods

We identified 91 total patients with chemotherapy-induced neutropenia treated with 300 mcG/mL of filgrastim daily for 2 days. Thirty patients had weights less than 60 kg, 53 patients had weights between 60 and 85 kg, and 8 patients had weights > 85 kg. Outcomes included increases in WBC and ANC, incidences of febrile neutropenia or infections, and whether delays of chemotherapy or dose reductions occurred. Univariate logistic regressions were utilized to examine correlations between outcomes and variables of interest (i.e. weight, chemotherapy, cancer site).

Results

Following filgrastim, 98% and 95.33% of encounters had increases in WBC and ANC, respectively. Similar responses in WBC and ANC counts were noted among all three weight groups, with $p = 0.352$ and $p = 0.554$, respectively, for the 60 to 85 kg cohort and no documented declines in the >85 kg cohort. Patients with weights between 60 and 85 kg did not have higher infection rates (5% vs. 0%; $p = 0.1658$), but patient weight > 85 kg was associated with an increased infection rate (5% vs 33%; $p = 0.0011$). No differences were noted with respect to incidences of chemotherapy delay, dose reductions, or febrile neutropenia.

Conclusion

Based on our findings, patients with weights between 60 and 85 kg receiving 300 mcG/mL of filgrastim have similar immune responses and complication rates as those receiving the recommended 5 mcG/kg dose with a cost-savings of \$1618 per prescription.

Development and Validation of a Step Test of Aerobic Fitness in Young Children

Rebecca Hayes, Dylan Maldonado, Terry Shepherd, Saurabh Mehta, Susan Flesher
Department of Pediatrics, Joan C Edwards School of Medicine

Background

The FITNESSGRAM is the most widely used assessment of youth fitness in the world and utilizes two tests to estimate aerobic fitness (VO₂MAX) in children, the Progressive Aerobic Cardiovascular Endurance Run (PACER) and the One-Mile Run. These field tests require that young children give maximum effort, which translates to poor reliability and validity of results. Consequently, VO₂MAX standards for the PACER and One-Mile Run were not developed for children less than ten years of age participating in the FITNESSGRAM.

Hypothesis

The purpose of this study was to develop a simple submaximal exercise step test to expand the ability to estimate aerobic fitness in children 5-10 years of age.

Methods

Subjects completed two trials of a newly designed step test and a maximal graded exercise test to determine actual VO₂MAX. Subjects stepped to a 22-step/minute cadence with a protocol consisting of 4, 8, and 12-inch step heights. Heart rate was obtained after subjects stepped for 2 minutes at each height. This was repeated after a rest period. To determine VO₂MAX, subjects did treadmill exercise testing to exhaustion with open circuit spirometry.

Results

125 children ages 7-10 participated. 14 were excluded due to inadequate effort, with 111 included in analysis. The number of 5 and 6 year olds participating was inadequate for inclusion. The step test average heart rate showed excellent reliability (intraclass correlation coefficient of 0.98). Correlations between measured VO₂MAX and the predictor variables of BMI as well as step test average heart rate were moderate for both sexes (PCC of -0.6 and -0.59). The final models for the regression analyses assessing the relationships between VO₂MAX, sex, BMI and step test average heart rate indicated an acceptable level of validity (R = 0.71).

Conclusion

This study successfully developed and validated a new effort independent step test to estimate the aerobic fitness of children ages 7-10.

How to Manage Persistent Draining Wounds after Total Joint Arthroplasty

Ali Oliashirazi, Sophia Oliashirazi, Alisina Shahi, Jonathon K. Salava

Orthopaedic surgery

Background

Persistent wound drainage has been recognized as one of the major risk factors of periprosthetic joint infection(PJI). Currently, there is no consensus on the management protocol for patients that develop wound drainage after total joint arthroplasty(TJA). The objective of our study was to describe a multimodal protocol for managing draining wounds after TJA and assess the outcomes.

Hypothesis

Evidence based management protocol for draining wounds

Methods

We conducted a retrospective study and a consecutive series of 4,873 primary TJAs were reviewed. Using an institutional database, patients with persistent wound drainage (>48 hours) were identified. A review of the medical record was then performed to confirm drainage. Draining wounds were first managed by instituting local wound care measures. If drainage persists past 7 days, a superficial irrigation and debridement (I&D) was performed if the fascia was intact and an exchange of modular parts was performed in cases of fascial disruption (Figure 1). TJAs that underwent subsequent I&D, revision surgery, or developed PJI within one year were identified.

Results

Draining wounds were identified in 6.2% (302/4,873) of all TJAs. Overall, 65% (196/302) of patients with draining wounds did not require any surgical management. Of the patients with persistent drainage, 9.8% underwent I&D, 25.0% underwent revision arthroplasty. Moreover, 15.9% of those patients developed PJI within one year. Compared to those without wound drainage, TJAs complicated by wound drainage demonstrated an odds ratio of 16.9(95%CI:9.1-31.6) for developing PJI, and 18.0(95%CI:11.3-28.7) for undergoing subsequent surgery.

Conclusion

Wound drainage after TJA is a major risk factor for subsequent PJI and its proper management has paramount importance. Our results demonstrated that drainage ceased spontaneously in 65% of the patients with local wound care measures alone. Wounds with persistent drainage were at substantially higher risk for PJI than those that healed uneventfully.

Incidence and Survival of patients with Multiple Myeloma with Prior Diagnoses of Myeloproliferative Disorders

Hassaan Jafri MD, Roma Srivastava MD, Muhammad Omer Jamil MD

Internal Medicine, Marshall University School of Medicine. Department of Hematology/ Oncology, Marshall University School of Medicine

Background

The myeloproliferative neoplasms (MPNs) exhibit terminal myeloid cell expansion in the peripheral blood, resulting in various combinations of erythrocytosis, leukocytosis, thrombocytosis, bone marrow hypercellularity/fibrosis, and splenomegaly. Common chronic myeloproliferative disorders include chronic myeloid leukemia, polycythemia vera, essential thrombocythemia and primary myelofibrosis. MPN generally have good prognosis and with recent advancement in management survival has increased significantly. Multiple myeloma (MM) is characterized by the neoplastic proliferation of immunoglobulin-producing plasma cells.

Hypothesis

Incidence of MM is higher in patients with prior diagnoses of MPN compared to general population owing to dysregulated hematopoiesis.

Methods

We used the Surveillance, Epidemiology and End Results Program (SEER) data from 2001-2011 where we found total 47 patients that had multiple myeloma with a prior MPN(cases). We then selected three control patients with MM without prior MPN for each of the case patients matched by age, race and sex.

Results

Incidence of MM for patients with prior MPN was 28 cases for males while expected incidence was 14.88 over the study follow up period. Standardized incidence ratio (SIR) for males was 1.88, 95% Confidence Interval (1.25-2.72). Observed incidence for females was 19 and expected incidence was 10.31. Standardized incidence ratio for females was 1.84, 95% Confidence interval (1.11-2.88). Total incidence was 47 while expected total incidence was 25.19. Standardized incidence ratio for all patients was 1.87, 95% Confidence interval (1.37-2.48). Comparison of survival between the patients with prior MPN with those without prior MPN showed patients with prior MPN had trend towards better survival($p=0.09$).

Conclusion

Patients with MPN are more likely to be diagnosed with MM than general population. MPN patients with MM show trend towards better survival when compared to general population.



ORAL SESSION III • 3:15 PM – 4:03 PM

29TH ANNUAL RESEARCH DAY ORAL SESSION

Incremental Risk Stratification in Stable Patients Undergoing Elective Cardiac Catheterization with Cardiac Biomarker Score

Naveed Iqbal MD, Yuping Wu PhD, Stanley L. Hazen MD PhD, W. H. Wilson Tang MD

Department of Cardiovascular Medicine of Marshall University, Heart and Vascular Institute Cleveland Clinic, Department of Mathematics, Cleveland State University, Cleveland, Ohio.

Background

Several cardiac biomarkers have established their prognostic value in patients with acute coronary syndromes, although their relative prognostic significance, individually or combined, has not been prospectively validated.

Hypothesis

The aim of this study was to evaluate the extent to which B-type natriuretic peptide (BNP), myeloperoxidase (MPO), and high-sensitivity C-reactive protein (hsCRP) alone or together could be prognostic biomarkers in patients who were undergoing elective coronary angiography.

Methods

We measured plasma levels of B-type natriuretic peptide (BNP), myeloperoxidase (MPO), and high-sensitivity C-reactive protein (hsCRP) in 3,635 consecutive stable patients undergoing elective cardiac catheterization without acute coronary syndrome (cardiac troponin negative), and examined their relationship with incident major adverse cardiac events (MACE = death, non-fatal myocardial infarction [MI], stroke) over 3 years.

Results

In our study cohort (mean age 63.11 years, 65% male, 33% history of MI, 29% diabetes mellitus), median [interquartile range] levels of hsCRP, BNP, and MPO were 2.00[0.91-4.47] pg/mL, 83[34-200] pg/mL, and 103[70-195] pmol/L, respectively. After adjusting for traditional risk factors and renal function, log-transformed BNP and hsCRP remained independent predictors of incident major adverse cardiac events (MACE) at 3-year follow-up (Hazard ratio: BNP 1.67 [95%CI: 1.48-1.88], $p < 0.001$, hsCRP 1.41 [95%CI: 1.28-1.56] $p < 0.001$). MPO did not turn out to be an independent predictor with a hazard ratio of 1.09 [95%CI: 0.99-1.21], $p = 0.075$) in this population. Most notably, a cardiac biomarker score based on sum total of "positive" biomarkers provided independent prediction of future risk of incident MACE at 3 years (HR: 7.61 [95%CI: 4.98-11.65] $p < 0.001$), even after adjusted for traditional risk factors (6.11[95%CI: 3.98-9.38] $p < 0.001$), in addition to ApoB/ApoA1 ratio.

Conclusion

In stable patients undergoing elective coronary angiography with no acute myocardial infarction, an assessment of cardiac biomarker score integrating systemic biomarkers of myocardial dysfunction (BNP), plaque vulnerability (MPO), and systemic inflammation (hsCRP) provide independent prognostic value for long-term adverse clinical events.

Patient Satisfaction for Orthopaedic Department in Cabell Huntington Hospital

Milad Modarresi, Rodrigo Aguilar, Franklin D. Shuler, Felix Cheung

Department of Orthopaedics, Marshall University Medical Center

Background

Hospital Consumer Assessment of Healthcare Providers and System (HCAHPS) has provided a standardized survey method in order to evaluate the patient's satisfaction on the care they had. Overall patient satisfaction is clearly a multidimensional concept. These could include factors like their education status, overall health, nursing staff and physician encounter.

Hypothesis

This study tries to identify and establish main reasons to some patient's level of satisfaction of their visit to Cabell Huntington Hospital Orthopaedics department.

Methods

Data was collected from surveys handed in 3 consecutive months; June, July and August of 2013. Sixteen questions were selected from the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) that were appraised to be relevant for the use in orthopaedics department. Dependent variables were: how likely is a patient to recommend the department is and how was the overall satisfaction in their visits. Data was then gathered and step-wise multi variable regression analysis was performed. All analyses were performed using SAS version 9.3

Results

Among 1,138 patients answered the survey, variables which had impact the most on rating if the patient is likely to recommend to friends and family, were: how prompt was the help using the office telephone (93.30% vs 6.70%, $p < 0.0001$); and patient overall health (96.80% vs 3.20%, $p < 0.0001$). Regarding patient overall satisfaction, patient overall mental/emotional health (86.14% vs 13.86%, $p < 0.0001$); and front desk treating patients with respect (79.17% vs 20.83%, $p < 0.0001$); had the most influence.

Conclusion

Prompt telephone service and a respectful front desk had the most influence on patient satisfaction in an orthopaedic office. The patient's initial presenting overall health had significant impact on overall satisfaction scores. This may mean orthopaedic surgeons who treat sicker patients may be unfairly penalized with lower scores. Further study is needed.

The Influence of Cirrhosis and Fatty Liver on Survival in Septic Shock

Yasir Jawaid, Waseem Ahmed, Christie Mannino, Thomas Judge, Akash Ajmera
Department of Internal Medicine, Joan C. Edwards School of Medicine, Huntington,
WV

Background

Fatty liver and cirrhosis have become increasingly common in hospitalized patients. In 1998, more than 25,000 patients were cirrhotic, making it the tenth most common cause of mortality in the US. Additionally, the most common cause of demise in cirrhotics is sepsis.

Hypothesis

We hypothesized that fatty liver and cirrhosis are independent predictors of mortality in septic shock.

Methods

We retrospectively sampled patients admitted to the ICU with diagnostic codes of sepsis and septic shock. These patients were separated into groups of alive and deceased. A number of pertinent variables were collected and analyzed, including fatty liver, cirrhosis, chronic kidney disease (CKD), albumin, lactate, age, multiple organ dysfunction syndrome (MODS), and APACHE II scores.

Initially, the two groups were compared for significant differences using univariate analysis, including chi-squared and t-tests as appropriate. Subsequently, each variable found to be significant was analyzed using multivariate analysis (logistic regression) to evaluate whether any were independent predictors of mortality in patients with septic shock.

Results

293 patients with sepsis and septic shock were included in our study, out of whom 185 were alive, and 108 were deceased. Univariate analysis results showed that variables reaching statistical significance included cirrhosis ($p < 0.01$), CKD ($p = 0.05$), MODS > 2 ($p = 0.03$), median lactate within 24 hours ($p = 0.05$), age ($p < 0.01$), and APACHE II score ($p < 0.01$). Interestingly, fatty liver was not statistically significant ($p = 0.39$). Upon further investigation of significant variables with multivariate analysis, only the presence of cirrhosis ($p = 0.03$), age ($p < 0.01$), and APACHE II score ($p < 0.01$) were found to be independent predictors of mortality in septic shock patients.

Conclusion

The presence of fatty liver does not have any statistically significant effect on mortality in septic shock. Variables found to be significant independent predictors of mortality in septic shock were the presence of cirrhosis, age, and APACHE II score.

What Are the Risk Factors of Persistent Wound Drainage after Total Hip and Knee Arthroplasty?

Ali Oliashirazi, Sophia Oliashirazi, Alisina Shahi, Jonathon K. Salava
Orthopaedic surgery

Background

Persistent wound drainage has been recognized as one of the major risk factors of periprosthetic joint infection (PJI).

Hypothesis

The aim of this study was to determine the risk factors contributing to prolonged wound drainage and its relationship to the length of hospital stay and PJI.

Methods

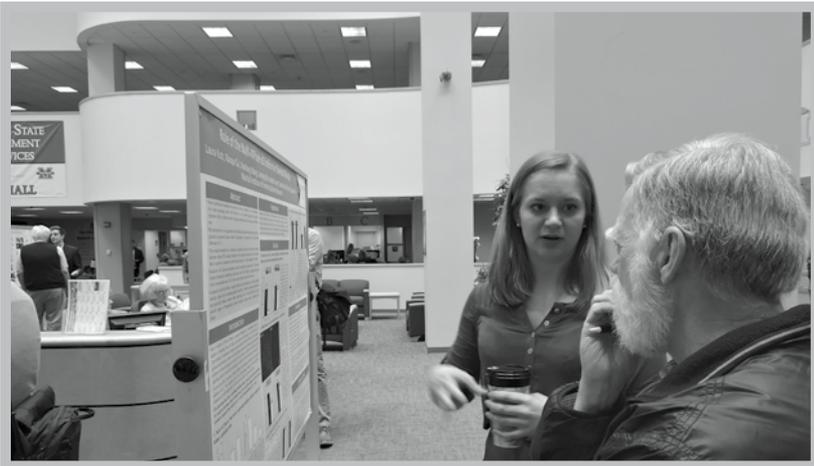
We conducted a retrospective study of 4,873 total joint arthroplasties (TJA). To identify the risk factors, Charlson and Elixhauser comorbidity indexes along with the patients' demographics were taken into account. Acute PJI was identified based on the musculoskeletal infection society criteria within 90 days postoperatively. A multivariate logistic regression model was designed to calculate the odds ratios.

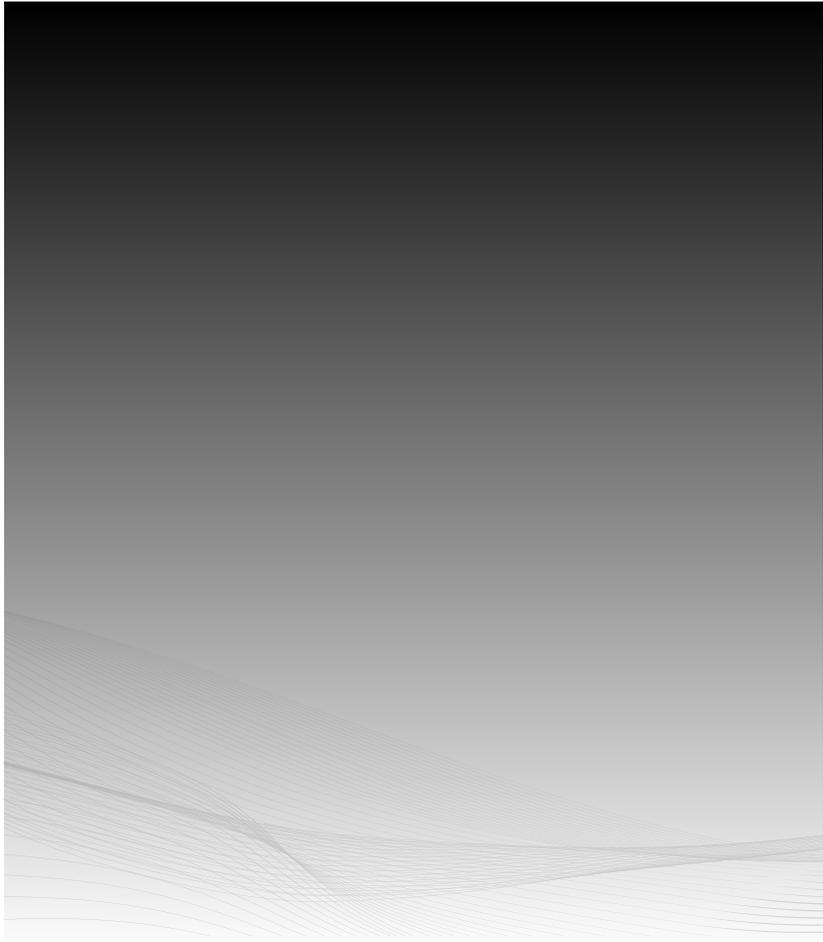
Results

Diabetes (odds ratio:21.2, 95%Confidence Interval [CI]:12.8-25.1), Morbid obesity (odds ratio:17.3,95%CI:14.7-21.5), rheumatoid arthritis (odds ratio:14.2,95%CI:11.7-16.5), chronic alcohol use (odds ratio:4.3,95%CI:2.3-6.1), hypothyroidism (odds ratio:2.8,95%CI:1.3-4.2), female gender (odds ratio:1.9,95%CI:1.1-2.2), total knee arthroplasty (odds ratio:1.4,95%CI: 1.1-1.6) were associated with persistent wound drainage. Interestingly, morbid obesity was strongly associated with prolonged wound drainage in the total hip arthroplasties ($p = 0.005$) but not in the total knee arthroplasties ($p=0.681$). In 2014 our anticoagulation protocol changed from Coumadin to Aspirin. The rate of wound drainage significantly dropped at this time point from 6.3% to 3.1% ($p<0.001$). Furthermore, wound drainage resulted in a significantly longer hospital stay in both groups ($p < 0.005$) and higher rates of PJI (odds ratio:16.9, 95%CI:9.1-31.6).

Conclusion

Several modifiable risk factors were identified to contribute to persistent wound drainage development after TJA. Surgeons must be cognizant of these comorbidities and optimize them prior to elective TJA. Our findings were in line with the previous studies and demonstrated significant increased rates of PJI when draining wounds occur. Moreover, it appears that using aspirin for anticoagulation can potentially help reducing the incidence of persistent drainage and therefore, the subsequent PJI after TJA.





BASIC SCIENCE POSTER SESSION I • 9:45 AM – 10:30 AM

29TH ANNUAL RESEARCH DAY POSTER SESSION

Anti-Viral Agent Tenofovir Causes Mitochondrial Damage and Oxidative Stress in HK-2 Cells

Rachel M. Murphy¹, Daniel A. Rodriguez De Anda², Kathleen Brown¹, Morghan Getty¹, Monica A. Valentovic¹

1. Department of Pharmacology, Physiology, and Toxicology, Marshall University
Joan C. Edwards School of Medicine, 2. University of Texas Rio Grande Valley

Background

Tenofovir disoproxil fumarate (TDF) is a highly effective HIV antiviral drug approved for treating Human Immunodeficiency Virus and Hepatitis B. It is one of the first line drugs used to treat HIV. Tenofovir (TFV) is administered orally as the prodrug TDF, which is deesterified to the active drug TFV. Renal damage is a major adverse effect associated with its use. TFV can induce decreased glomerular filtration rate (GFR), renal failure, and Fanconi Syndrome.

Hypothesis

The exact mechanism of toxicity remains unknown, largely due to limited experimental models.

Methods

TFV, the active form of TDF, was used for all studies. HK-2 cells were seeded and grown to confluency for 48h followed by 24-72h exposure to 0-28.8uM TFV. The vehicle was phosphate buffered saline (PBS). Cell viability was assessed using the MTT assay and Trypan Blue cell counts. Mitochondrial dysfunction was examined by measuring ATP and ADP levels, evaluating cytochrome c leakage, and by assessing the Cell Energy Phenotype and Bioenergetic Health Index of mitochondria using Seahorse XFp technology. Oxidative Stress was evaluated by studying protein carbonylation and 4-hydroxynonenal (4-HNE) adducts by Western blot. Data are given as mean±SEM with n=6; analysis was performed using a two-tailed t-test or one-way ANOVA with a 95% confidence interval, p<0.05.

Results

TFV reduced HK-2 cell viability at 24-72h as shown by the MTT Assay and Trypan Blue exclusion cell counts. TFV reduced ATP levels and increased cytochrome c leakage at 72h compared to PBS-control. Oxygen Consumption Rate (OCR) and Extracellular Acidification Rate (ECAR) were decreased following 24-72h exposure to 14.5 and 28.8uM TFV. TFV induced oxidative stress. Protein carbonylation and 4-HNE adduct formation were used as biomarkers of oxidative stress; both parameters were increased at 72h TFV exposure relative to PBS-control.

Conclusion

TFV cytotoxicity and mitochondrial damage were apparent at clinically relevant concentrations in 24-72h exposure of HK-2 cells.

Biomet Polyax distal femoral locking plates for supracondylar femur fractures demonstrate a biomechanical advantage over intact saw bones in load to failure testing.

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Background

The principle of treating supracondylar femoral fractures has evolved to follow rigid internal fixation of the fracture site so that early ambulation and rehabilitation can take place. However, the type of fixation construct is not universally agreed upon. Historically, the Gold standard had been angled blade plating or compression screw and side plating. Biomet polyax distal femoral locked plating system creates a stable angular construct that is useful for both comminuted fractures and osteoporotic bone. To date there has only been one study published, a retrospective study on the outcomes of Biomet polyax plates in 71 patients, but a literature search failed to yield any biomechanics studies of the Biomet polyax distal femoral locking plating system. Our study focused on the Biomet Polyax distal femoral locked plate.

Methods

Load to failure in two different lengths of Biomet Polyax distal femoral locked plates (6 hole and 12 hole) on industry approved sawbone femurs with artificially created supracondylar fractures were tested.

Results

The results of our study showed the mean load to failure for control non-plated sawbones, six hole polyax locked plate sawbones, and twelve hole polyax locked plate sawbones were 673N, 1120N, and 1302N respectively. The difference in load to failure for was statistically significant for control vs short plate, control vs. Long plate and short vs long plate constructs ($p < .01$) respectively. Our data demonstrates a biomechanical advantage to locked plating in supracondylar femoral fractures, and that the 12 hole biomet polyax plate construct has a significantly higher load to failure than its 6 hole counterpart.

Conclusion

Our data shows that both the six and twelve hole poly-ax locked plate constructs for supracondylar femur fractures were stronger than intact sawbones.

Capsaicin Sensitizes Small Cell Lung Cancer Cells to Camptothecin Induced Apoptosis

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Background

Camptothecin is one of the prominent drugs for the treatment of small cell lung cancer (SCLC). Chemotherapy initially shows excellent outcomes with 60-80% patients achieving remission. However, patients relapse within a year, with the tumors ceasing to respond to chemotherapy or radiation. Therefore, agents which can increase the response rate of camptothecin should be of considerable benefit to SCLC patients.

Hypothesis

Nutritional agents have been shown to improve the anticancer activity of chemotherapy in cell culture, as well as animal models. Capsaicin has been shown to improve the anticancer activity of cisplatin and adriamycin in cell culture models. The central hypothesis of our study is that the combination of capsaicin and camptothecin will show improved apoptotic activity in small cell lung cancers, than in either agent administered alone.

Methods

Caspase activity assay and Cell Death ELISA were used to determine the apoptotic activity of capsaicin, camptothecin, and the combination of both of these drugs. Statistical analysis of the data obtained was performed using the Chou-Talalay isobologram. Chemical inhibitors were used to block the calpain pathway and the calcium pathway. The activity of calpains was analyzed using fluorescent enzyme assays.

Results

Caspase-3 activity assays reveal that the combination of camptothecin and capsaicin displayed greater apoptotic activity than any of the compounds used alone. The results from caspase-3 assays were confirmed using a second independent apoptosis assay, namely the Cell Death ELISA. Analysis of the data by the Chou-Talalay isobologram method showed that capsaicin synergizes with camptothecin to produce a higher magnitude of cell death. The synergistic effects of capsaicin and camptothecin are mediated by the calpain pathway and involved elevation of intracellular calcium.

Conclusion

The results of our studies will foster the hope of novel nutrition based combination therapies for human SCLC.

Characterization Of Expression Levels Of Genes Involved In Adipogenesis And Inflammation In Congenic Mice Carrying Obesity and Hyperlipidemia QTL on Chromosome 1

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Background

The development of obesity is likely due to interactions of susceptibility genes with obesity-promoting environments like high fat diets (HFD). This leads to an expansion of adipose tissue and inflammation. Previously, we identified quantitative trait loci (QTL) linked to obesity and hyperlipidemia on chromosome 1 using F2 progeny of obese TALLYHO/Jng (TH) and lean C57BL/6 (B6) mice. We established congenic mice carrying the QTL derived from TH on a B6 background. The congenic mice were more susceptible to diet-induced obesity than B6.

Hypothesis

The purpose of this study was to characterize the congenic mice by examining mRNA and protein levels of adipocyte differentiation and inflammation markers in adipose tissue and liver.

Methods

Congenic and B6 mice were weaned onto chow and HFD and maintained until 16 weeks old, and total RNA and protein isolated from adipose tissue and liver. mRNA and protein levels of Pparg, Cebpb, Pref-1, and Il-6 were measured by qRT-PCR and western blot analysis, respectively. Data were analyzed by ANOVA.

Results

Congenic mice had a 2-fold increase in mRNA level of Pparg, a major adipogenic regulator, in adipose tissue than B6 on chow. HFD significantly increased mRNA level of Pparg in adipose tissue in both groups, with greater extent in congenics. Similar trend was seen in protein level of Pparg in adipose tissue. No significant differences were found in mRNA levels of Pref-1, repressor to adipocyte differentiation, and Cebpb, early adipogenic transcription factor, in adipose tissue between groups for either diet. The mRNA level of IL-6, proinflammatory marker, was increased by HFD in adipose tissue in both groups, without genotype difference. This trend was seen in protein level of IL-6 in adipose tissue and liver, without statistical significance.

Conclusion

Collectively, we demonstrated that gene expression levels of Pparg were significantly upregulated in adipose tissue of congenic mice on chow and HFD.

Characterization of Renal Cytotoxicity Stress Induced by the Radiocontrast Agent Diatrizoic Acid (DA) in a Human Kidney Cell Line

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Background

Contrast Induced-Acute Kidney Injury (CI-AKI) is the third most common cause of acute renal failure in hospitalized patients. CI-AKI is the result of exposure to iodinated contrast media which are required for many diagnostic procedures including: computed tomography, angiography, and cardiac catheterization. The risk of renal injury increases if a patient has a predisposing factor such as chronic kidney disease, congestive heart failure, or diabetes. Although the exact mechanism of toxicity of CI-AKI is not known, the current theories suggest: oxidative stress, changes in renal hemodynamics, and direct cytotoxicity are contributing to CI-AKI nephrotoxicity.

Hypothesis

This project tested the hypothesis that the radiocontrast agent diatrizoic acid (DA) will induce direct cellular cytotoxicity in the form of oxidative stress and mitochondrial dysfunction in the absence of hemodynamic influence.

Methods

Immortalized human adult proximal tubular epithelial (HK-2) cells (ATCC) were incubated with clinically relevant concentrations (0-18 mg l/mL) of DA for 24 hours. All treatment groups had a sample size of n=6. Viability was assessed using the conversion of (3-(4,5-Dimethylthiazol-2-yl)-2,5-Diphenyltetrazolium Bromide) (MTT) to formazan and trypan blue exclusion assays. Oxidative stress was quantitated using Western blot analysis for 4-hydroxynonenal (4-HNE) and protein carbonylation (OxyBlot). Preliminary studies investigated tumor necrosis factor alpha (TNF- α) and mitochondrial function by examining cytochrome c release.

Results

Toxicity was evident in HK-2 cells exposed to 2, 5, 10, 15, and 18 mg/ml relative to phosphate buffered saline used as vehicle control ($p < 0.05$) at 24 hours as measured by the MTT assay and trypan blue exclusion.

Conclusion

The results of this study showed that the HK-2 cells are sensitive to clinically relevant concentrations of DA within 24 hours.

Doxorubicin Cytotoxicity in a Human Proximal Tubular Epithelial Cell Line was Attenuated by the Natural Product Resveratrol.

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Background

The cancer chemotherapeutic agent Doxorubicin (DOX), Adriamycin, is part of the treatment regimen for breast, ovarian, small cell lung cancer, acute and chronic lymphoid leukemia. Adverse effects associated with DOX are cardiotoxicity and nephrotoxicity. Interventions are needed to reduce DOX nephrotoxicity. Resveratrol (RES) is a phytochemical contained in grapes, berries, and nuts which possesses antioxidant and anticancer properties.

Hypothesis

This study tested the hypothesis that RES will reduce DOX renal cytotoxicity in human noncancerous renal proximal tubular epithelial cells (HK-2) and that RES will attenuate DOX mediated changes in mitochondrial function.

Methods

HK-2 cells were plated and grown for 48 h. Cells were next pre-incubated for 1 h with 0 (DMSO), 5, or 7.5 uM RES followed by a 24 h co-incubation with 0-5 uM DOX. RES did not alter cell growth or viability at the concentrations tested as indicated by comparable MTT values between DMSO and RES groups ($p > 0.05$).

Results

Cell viability was further assessed by cell count using Trypan blue exclusion. DOX produced a decline in viability within a 24 h exposure. Pretreatment for 1 h with RES was sufficient to reduce DOX loss of cell viability. Studies were initiated to investigate the cellular mechanism of RES attenuation of DOX cytotoxicity. Western blot of cells following 24 h exposure examined increased protein carbonylation as an indicator of oxidative stress. Initial studies were begun to examine DOX effects on mitochondrial oxygen consumption using a Seahorse platform.

Conclusion

In summary, RES did not diminish cell viability at the concentrations tested in our HK-2 cells. DOX diminished cell viability within 24 h relative to vehicle control. A 1 h pretreatment with RES reduced DOX cytotoxicity in HK-2 cells. Prevention of mitochondrial impairment and oxidative stress by DOX are potential mechanisms for RES protection in HK-2 cells.

Dual Effects of EZH2 Inhibitor on Endometrial Cells

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Background

Endometriosis is complex disorder that afflicts many women with chronic pelvic pain and infertility. It is believed that polycomb group of proteins (PcG) such as enhancer of zeste homolog 2 (EZH2), which plays a major role in cancer, might contribute to endometriosis. Our previous studies showed upregulation of PcGs in endometriotic tissues. We hypothesized that PcGs expression was elevated in the peritoneal fluid (PF) and that EZH2 inhibitors will suppress its expression.

Hypothesis

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Methods

Ishikawa (human endometrial) cells were treated with PF from IRB-approved and consented women with and without endometriosis and pain (n=3-6/group). A subset of cells was also treated with 5 or 500 nM GSK126, a synthetic EZH2 inhibitor. Real-time PCR was used to analyze EZH2 mRNA expression. Western blot was used to determine the relative protein levels of EZH2 and H3K27me3.

Results

Ishikawa cells showed 2-3 fold induction in EZH2 mRNA expression in the presence of PF from women with endometriosis with and without pain (YY and YN). Western blot showed minimal changes in the protein expression of EZH2 or H3K27me3 in the PF treated cells. EZH2 inhibitor GSK126 showed a dose dependent decrease in EZH2 mRNA expression in cells treated with YY-PF compared to PF from NN and YN-PF. Interestingly, GSK126 treatment actually increased the expression of H3K27me3 in these cells.

Conclusion

Our results indicate that treatment with the EZH2 inhibitor, GSK126, had a dose dependent effect on EZH2 mRNA expression on endometrial cells in the presence of PF from women with endometriosis, however its effects on H3K27me3 still needs to be validated. Literature has shown much higher doses of GSK126 have a better inhibitory profile in cancer cells. Our future studies will test higher concentrations of EZH2 inhibitors on EZH2 expression and its downstream pathways in endometrial cells.

Effect of Dietary Oils on Adipocyte Lipid Accumulation to Reduce the Risk of Metabolic Syndrome

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Background

Globally, health care practitioners have seen an emergence of the metabolic syndrome, which is a modern epidemic with major public health concern. Metabolic syndrome is a group of risk factors characterized by obesity, dyslipidemia, hypertension, insulin resistance, and increased systemic inflammation. Once diagnosed with metabolic syndrome, patients are at significantly higher risk of developing type 2 diabetes (T2D), heart disease and stroke. Two main approaches to reduce metabolic syndrome are life style modifications of diet and physical activity and by pharmaceutical interventions.

Hypothesis

The objective of this study was to assess the association between dietary oils and lipid accumulation. We hypothesize that plant dietary oils will reduce lipid accumulation in adipocytes.

Methods

Cell Culture: 3T3-L1 pre-adipocyte cells were cultured in DMEM supplemented with 10 percent bovine calf serum and 1 percent penicillin and streptomycin in a humidified incubator containing 5 percent carbon dioxide at 37 degrees Celsius and then exposed to differentiation media. Dietary oils (flaxseed, sunflower, vegetable and safflower) were prepared in various stock solutions in differential medium for three days. Differential medium was replaced with post differential medium and cells were incubated for an additional three days.

Lipid Accumulation: After exposure to various oils during differentiation, cells were then stained with oil-red-o dye. Dye solution was aspirated, plates were washed twice with phosphate buffered saline and cell morphology was photographed at x20 magnification. Dye remaining in cells was eluted by adding 100 percent isopropanol and the optical density of oil-red-o in isopropanol was measured by UV spectrophotometry at 520 nm.

Results

Adipocytes exposed to various plant dietary oils showed a decrease in lipid accumulation in adipocytes versus the control. Of dietary oils examined, flaxseed oil significantly decreased lipid accumulation in adipocytes.

Conclusion

Our findings indicate that inhibition of lipogenesis is characteristic of flaxseed oil and could reduce the risk of metabolic syndrome.

EFFECTS OF SENESCENCE ON LIVER METABOLISM BY GLUTATHIONE SPECIES AND METABOLOMIC PRINTS ON TWO RODENT MODELS OF NASH.

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Background

Non-alcoholic fatty liver disease (NAFLD) is a the third most common liver diseases in the Western World. It can progress to nonalcoholic steatohepatitis (NASH), a risk factor for cirrhosis, and hepatocellular carcinoma (HCC). The present study determines the association between NASH severity and progression and liver senescence.

Hypothesis

NASH severity score and its progression have a linear correlation with the liver senescences as judged by organ mitotic index, apoptotic index and glutathione ratio/metabolic prints.

Methods

Two rodent models, C57BL/6J and db/db were exposed to standard mouse chaw and to MCD diet, or HFD (60% cal from fat) with fructose in water for 12, 24, and 48 weeks. Glutathione reduced/oxidized (GS/GSSG) and Ophthalmate (OA) and metabolic prints (852 metabolites) were measured in treated plasma on controls and experimental groups by LC/Gas-MS methods. Findings were correlated on histology with parenchymal mitosis/apoptosis index. Statistical analyses were performed including Pearson correlation, principal component analyses (PCA) and partial least square discriminant analysis (PLS-DA).

Results

Glutathione ratio (reduced/oxidized) and OA significantly decreased as the age of the animal progresses. Metabolic prints were significantly different at weeks 0, 12, 24 and 48 of the study. Hepatic metabolic changes appears to correlate with a significant decrease in mitotic index but with similar morphological patterns.

Conclusion

Liver metabolism varies significantly with senescence and its changes may have conferred more sensitivity to older organs for injury after a enriched with lipids challenge. Glutathione changes and metabolic prints of senescence should be taking into account during the interpretation of metabolic prints of NASH in rodent models.

Exercise Modulates Energy Metabolism in an Obese “Stress-Less” Mouse Model

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Background

Oxidative stress plays a key role in obesity and its comorbidities. Redox stress affects skeletal muscle fiber type, myonuclei, and myokine levels and alters adipokine expression in adipose tissue. These physiological changes modulates energy metabolism resulting in an obese phenotype. Exercise paradoxically, increases redox stress which in-turn signals antioxidant protection.

Hypothesis

We hypothesized that reducing redox stress would lower body and fat mass, improve skeletal muscle and adipocyte function, and ultimately enhance energy metabolism.

Methods

To study this hypothesis, we used two ‘stress-less’ mouse models (i) that expresses 4-fold higher antioxidant, catalase (Cat-tg) and (ii) a hybrid between Cat-tg and obese mice (Ob/Ob), Bob-Cat. These two “stress-less” models along with their parent strains were subjected to moderate exercise (8 weeks of treadmill running) or sedentary regimen. Throughout the study, body weight, food intake, grip-strength, fat and lean mass (ECHO-MRI) were measured in addition to metabolic parameters (CLAMS). Changes in adipose and skeletal muscle function were also determined.

Results

Results showed both Bob-Cat and Cat-tg groups lost weight compared to C57 sedentary group, and exercised groups also showed decreased fat mass. CLAMS showed an increase in energy expenditure and food intake with exercise in all groups except the Bob-Cat group. Exercise also showed a trend towards increased insulin and HDL levels. Within adipose tissue, exercise trended to increase the mRNA expression of adiponectin and catalase in all groups and increase in catalase activity in C57 and Cat-tg groups. However, the combined beneficial effects of moderate exercise and antioxidant-excess did not have a major effect on skeletal muscle fiber type, myonuclear number or grip strength.

Conclusion

Our results show a positive influence by exercise on energy metabolism and obesogenic pathways in the novel “stress-less” mouse model. A role for gut-brain-adipose cross-talk in the metabolic changes seen in these groups are currently being investigated.

Gender-Specific Growth Patterns of Segmented Filamentous Bacteria

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Background

Imbalances within the gut microbial community are implicated in chronic intestinal inflammation and the development of autoimmune diseases. A recently discovered bacterium of the human microbiome, segmented filamentous bacteria (SFB), is an unculturable anaerobe and potent immune-stimulator of pro-inflammatory T-helper 17 cells. In a preliminary study, we used multiplex PCR to semi-quantitate the amount of SFB in C57BL/6 mice from two separate vendors. Our data revealed a gender-distinct growth pattern, with the basal level of SFB significantly higher in the microbiome of males compared to females.

Hypothesis

To explain this dichotomy, we hypothesize that SFB growth is androgen-dependent. Consistent with our hypothesis, anaerobic, fastidious microbes have been reported to exhibit accelerated growth in the presence of sex-specific hormones through inter-kingdom signaling. Furthermore, SFB expresses an enzyme belonging to the family of hydroxysteroid dehydrogenases, which in turn can mediate the balance between active and inactive sex steroids.

Methods

To delineate the role of androgens in SFB growth, the androgen receptor antagonist, Flutamide, will be administered (5mg/day) to male C57BL/6 mice for 21 days. Feces from five Flutamide-treated and five WT mice will be collected every other day and analyzed for SFB levels with quantitative PCR (qPCR). Basal (WT) and Flutamide-treated testosterone levels will be quantified by a Testosterone ELISA Kit. Additionally, qPCR analysis of male and female SFB levels will further validate our previous work.

Results

The results of this study will reveal the direct impact of androgens on SFB growth. Our preliminary data in mice suggest that the male microbiome naturally contains higher levels of SFB in comparison to the female microbiome.

Conclusion

We are the first to report that SFB has gender-specific growth patterns, suggesting intrinsic, gender-specific differences and predilections in the gut microbiome. This study will investigate the role of bacterial steroid-dependent gene regulation by determining if SFB growth is hormonally regulated.

Genomic Landscape of Acute Myelogenous Leukemia in West Virginia

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Background

A goal of the West Virginia Cancer Genomics Network (WVCGN) is to develop a genomic database for selected cancers with greater incidence in the Appalachian population. Oncogenesis involves genetic and epigenetic changes in somatic genomes that can serve as targets for improved diagnostics, risk stratification, and novel therapeutics. Acute myelogenous leukemia (AML) is a hematopoietic stem cell cancer of the myeloid lineage that involves the bone marrow and peripheral blood. This clonal malignant entity involves a vast number of driver mutations in various genes and pathways such as NPM1, CEBPA, t(15;17) PML-RARA, t(8;21) RUNX1-RUNX1T1, and FLT3, each of which possess specific prognostic and therapeutic indications.

Hypothesis

In order to identify driver mutations in WV AML cases, we performed whole exome sequencing on 18 AML patients (using bone marrow aspirates and buccal samples).

Methods

Exomes were sequenced to a depth of 100X in the MU Genomics Core Facility. One patient was omitted from analysis due to low coverage in the buccal sample. We developed an analytical pipeline that identified variants in normal and AML cells and compared the resulting variant pools to identify cancer-specific variants in each patient.

Results

A range of 5,379 to 110,388 cancer-specific variants were discovered. Among these somatic variants, we found protein-coding variants in 12 of 23 previously identified genes mutated in AML. The most commonly occurring of these were NPM1 (6 patients), FLT3 and TET2 (4 patients), and DNMT3A and IDH1 (3 patients). We additionally found a somatic loss of heterozygosity mutation in GPRIN2, not previously associated with AML, that occurred in 7 of the 17 patients.

Conclusion

These and other frequently mutated genes may serve as drivers and diagnostic tools for the WV AML cases.

Heme Oxygenase Induction Suppresses Hepatic Hecpcidin and Rescues Ferroportin and Ferritin Expression in Obese Mice

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Background

Hepcidin, a phase II reactant secreted by hepatocytes, regulates cellular iron levels by increasing internalization of ferroportin- a transmembrane protein facilitating egress of cellular iron. Chronic low-grade inflammatory states, such as obesity, have been shown to increase oxidative stress and enhance hepcidin secretion from hepatocytes and macrophages.

Hypothesis

Heme-heme oxygenase (HO) is a stress response system, the induction of which reduces oxidative stress thereby abating patho-physiological conditions such as obesity and metabolic syndrome.

Methods

8 weeks old male obese (ob) mice and their age- and sex-matched lean mice were used as controls. CoPP was administered intraperitoneally once a week (3 mg/kg) for 6 weeks to obese mice. CoPP plus stannous mesoporphyrin (SnMP) was administered intraperitoneally three times a week (20 mg/kg) for 6 weeks.

Results

We investigated the effects of HO-1 induction on hepatic hepcidin levels and on iron homeostasis in tissues from lean and obese mice. Obese mice exhibited hyperglycemia along with increased levels of pro-inflammatory cytokines (MCP-1, IL-6, $p < 0.05$), oxidative stress and increased hepatic hepcidin levels ($p < 0.05$). Enhancement of hepcidin was reflected in the reduced expression of ferroportin in obese mice ($p < 0.05$). Further our results showed attenuation of insulin receptor phosphorylation and attenuation of metabolic regulators including pAMPK, pAKT and pLKB1. Cobalt protoporphyrin (CoPP)-induced HO-1 up-regulation in obese mice and reversed these pathophysiological alterations ($p < 0.05$) while attenuating hepatic hepcidin levels and enhancing ferritin expression. These effects of CoPP were prevented in obese mice concurrently exposed to an inhibitor of HO (SnMP) ($p < 0.05$).

Conclusion

Taken together, our results highlight a modulatory effect of HO on iron homeostasis mediated through the suppression of hepatic hepcidin in conjunction with the rescue of cellular ferritin levels. Therefore these findings may prove an effective strategy in treating the metabolic consequences of obesity including alteration of liver iron homeostasis.

MicroRNA Editing Involved in Adipose Dysfunction during Aging

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Background

Adipose tissue is one of the key endocrine organ that maintains lipid and glucose homeostasis. Adipose dysfunction increases with aging, and results in dramatic alterations in fat mass, distribution and function. This leads to age associated metabolic dysfunction and increased risk to cardiometabolic diseases. Continuous replenishment of mature adipocytes by differentiation of pre-adipocytes to adipocytes is essential for normal adipose function. Our previous studies have shown a loss of pre-adipocyte differentiation during aging.

Hypothesis

We hypothesize that the adipose dysfunction associated with aging is a result of dysfunction in microRNAs involved in adipocyte differentiation. This dysfunction may be attributed to either changes in enzymes involved in biogenesis of miRNA (DROSHA, DICER) or enzymes involved in modifying its function such as the RNA editing enzymes (ADAR).

Methods

We determined the differences in the expression levels of DICER, DROSHA, and ADARs in Fisher 344 x Brown Norway hybrid rats (FBN) at ages 8 mo and 25 mo old (n=6). We determined editing in miR-143 (a key miRNA involved in adipogenesis) sequence in young and old rats using Sanger Sequencing.

Results

There were sex specific differences in the levels of both biogenesis and editing genes in peri-gonadal adipose tissue from FBN rats with aging. The DROSHA and DICER levels and the editing enzymes (ADARs) were altered during aging in a sex specific manner. Sanger sequencing of miR-143 (a key miRNA in adipogenesis) showed edited sequence in old rats compared to younger rats.

Conclusion

Our results show RNA editing of miRNA involved in adipogenesis with aging. Sex-specific post-transcriptional regulation of miRNA(s) involved in adipogenesis during aging will also be explored in adipose derived stem cells from aging rats and correlated to metabolic changes leading to insulin resistance.

Na/K-ATPase Mimetic pNaKtide Peptide attenuates aging in old C57Bl6 mice

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Background

Aging is characterized by inevitable but progressive decline of physiological integrity. Aging is evident by a number of physiological changes including loss of cell division, oxidative stress, DNA damage, telomeres shortening, nuclear changes and senescence-associated gene overexpression.

Hypothesis

As we had identified that the Na/K-ATPase can amplify oxidant signaling, we speculated that a peptide designed to inhibit this pathway, pNaKtide, might decrease senescence and might also maintain physiological integrity.

Methods

To test this hypothesis, C57Bl6 mice were divided into 6 groups as follows: (1) young control, (2) young control+pNaKtide, (3) old control (19 months) (4) old+pNaKtide, (5) old +western diet (WD), and (6) old+WD+pNaKtide. The pNaKtide was administered every week (i.p) for 2 months. Progression to senescence was evaluated in liver and kidney of mice by: studying morphology changes, RT-PCR for senescence markers, T-BARs assay to assess oxidative stress, and senescence associated B galactosidase assay.

Results

Hepatic and renal tissue of old mice showed significantly elevated levels of mRNAs (p21, apolipoprotein J, Collagenase 1, fibronectin) that are indicators of DNA damage confirming senescence through alterations in gene expression. These changes were more deteriorated in old mice fed a western diet. Morphological symptoms such as DNA damage, activation of senescence associated β -galactosidase, hepatic and renal fibrosis and inflammation were also significantly increased in old mice and old mice fed WD. On the contrary, old mice and old mice fed WD and treated with pNaKtide showed similar morphology and gene expression profile comparable to control group.

Conclusion

Taken together, our study demonstrates for the first time that Na/K-ATPase Mimetic pNaKtide Peptide significantly alleviate the genetic and phenotypic attributes of aging. pNaKtide is a novel drug for treating cellular damage responses that may contribute to manifestations of aging.

Optimization of Colorimetric β -Hematin Formation Assay Method for Antimalarial Drug Leads Screening

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Background

To facilitate our in-house antimalarial drug discovery program a study was designed to optimize the currently available β -hematin (BH) formation assay methods for antimalarial drug leads screening to improve the yield and reliability of the assay methods by reducing and controlling sources of variability.

Hypothesis

Malaria parasite converts free Heme to BH in their food vacuole and antimalarial drugs such as chloroquine (CQ) has been demonstrated to inhibit BH formation. In this study, it was hypothesized that Tween 20 will act as an in-vitro BH initiator similar to malaria parasites in vivo and CQ will inhibit the in-vitro BH formation. Thus, it will lead to the development of a new BH formation assay method for the discovery of new antimalarial drugs.

Methods

BH formation was initiated from commercially available hemin HCl by an addition of Tween 20 at the molar ratio of Tween/hemin of 0.5. CQ was used as a reference drug standard to determine the IC₅₀ value. A 96-well plate with all the test solutions was incubated for 4 hours at 37° C and shaken at 75 rpm. The percentage of BH formation was calculated by quantifying the remaining hemin solution at the detection wavelength of 405 nm using Multi-Mode Microplate Reader. The optimized method was validated by checking the specificity, linearity, repeatability, reproducibility and robustness.

Results

The BH formation assay method is found to be specific with the detection limit of 0.4 nmol, linear ($y=0.1106x-0.0019$, $R^2>0.999$), reproducible (%BH Assay \pm %RSD (86.2 \pm 1.5)) and robust with respect to incubation time 4 \pm 1h and shaking 75 \pm 15rpm. The method was also found with lower variability in comparison to literature methods. The IC₅₀ value for inhibition of BH formation by CQ was found to be 18.5 \pm 0.5nmol.

Conclusion

In conclusion, this user-friendly optimized assay method can be easily used for high throughput screening of novel antimalarial drug leads in any laboratory.

pNaKtide Attenuates Dyslipidemia and Atherosclerosis by Blocking Na/K-ATPase/Reactive Oxygen Species Amplification in ApoE ^{-/-} Mice

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Background

We have previously reported that the $\alpha 1$ subunit of the sodium potassium adenosine triphosphatase (Na/K-ATPase) acts as a receptor and amplifier for reactive oxygen species (ROS) generated by other processes, in addition to its ion pumping function. We have also shown that blockade of this amplification with a novel peptide, pNaKtide, ameliorates oxidative stress and obesity in mice subjected to a high-fat diet.

Hypothesis

Given the aforementioned importance of oxidative stress in the pathophysiology of atherosclerosis, we chose to examine whether pNaKtide might be effective in ameliorating dyslipidemia and atherosclerosis in ApoE ^{-/-} (ApoE knockout) mice by blocking Na/K-ATPase-induced ROS amplification.

Methods

pNaKtide was administered in a murine model of dyslipidemia and atherosclerosis (the ApoE knockout mouse fed "western" diet). 25 mg/Kg pNaKtide was administered intraperitoneally once every 7 days. Lipid profile, glucose insulin levels, and ROS levels were measured. Aortas were dissected and stained with H&E and Sudan IV; quantification of aortic lesions was done.

Results

Our results show that pNaKtide improved glucose tolerance and HOMA-IR scores in ApoE^{-/-} mice fed a western diet. Also pNaKtide administered to these mice significantly decreased plasma ALT, triglycerides, FFA, and LDL levels. Further, our results show that ApoE ^{-/-} mice fed a western diet had decreased plasma HDL levels and this decrease was reversed by pNaKtide. Plasma ROS levels were significantly increased in ApoE ^{-/-} mice fed a western diet compared to mice fed a standard chow diet and this increase in ROS levels was attenuated by pNaKtide treatment. Mice fed a western diet had increased plaque size. Plaque size was significantly decreased by pNaKtide treatment.

Conclusion

This study suggests that the Na/K-ATPase/ROS signaling cascade is a possible mechanism for the development of dyslipidemia and atherosclerosis associated with the metabolic syndrome phenotype and pNaKtide presents a potential novel treatment for these pathologies.

Pyrimidines Regulate the Transcription in the Alginate Biosynthetic Pathway in *Pseudomonas aeruginosa*

Roy Al Ahmar, Hongwei Yu

Biomedical Sciences, Marshall University

Background

Pseudomonas aeruginosa is an important pathogen that results in chronic respiratory infections in patients with Cystic Fibrosis. The ability to produce the alginate biofilm in the patient lung is the main factor for the chronicity of *P.aeruginosa*. Therefore, understanding the mechanism behind the biosynthesis of alginate in *Pseudomonas* would help in the treatment of this infection. In recent work it was shown that deletion of genes, that are part of the pyrimidine biosynthesis, led to a loss of alginate production in *Pseudomonas aeruginosa* strain PAO581, a stable mucoid reference strain.

Hypothesis

In this study we investigate the link between the alginate synthesis and the pyrimidine de novo biosynthesis pathways. We hypothesize that pyrimidines control the transcription of the several enzymes involved in either the control or production of alginate.

Methods

Using a promoter reporter system, we tested region of control that is lost with the loss of pyrimidine synthesis. The mutants had the genes complemented in trans on an in house vector (pHERD20T). Supplementing growth media with 0.1 mM nucleotides returns the mucoid phenotype. Cystic fibrosis isolates were tested with supplemented media to observe the change in mucoidy.

Results

Loss of pyrimidine synthesis affects at the level of PalgD and not at the PalgU level or the alginate biosynthesis pathway. Therefore, the deficiency in pyrimidines results in a lower transcription activity of the algD operon. Uracil and cytosine resulted in a restoration of mucoidy but neither adenine nor guanine restored mucoidy. It was also shown that PAO581 became more mucoid when all four nucleotides were supplemented in the media.

Conclusion

This study concluded that pyrimidines regulate the transcription of the algD operon in *P.aeruginosa*. A decrease in the amounts of pyrimidine in the bacterial cell results in a decrease in transcriptional activity leading to a loss in alginate production.

The Aryl Hydrocarbon Receptor Regulates JAG1 Expression in Triple Negative Breast Cancer Cells

Sean Piwarski, Travis Salisbury

Physiology Pharmacology and Toxicology, Marshall University

Background

Approximately 10-20% of breast cancer patients are diagnosed with triple negative breast cancer (TNBC). Jagged1 (JAG1) is a transmembrane receptor protein that has been proven to play a role in cancer biology and is normally over-expressed in TNBC. Studies show that JAG1 plays a key role in metastasis in various cancers and high JAG1 mRNA and protein expression levels have been identified as indicators of poor prognosis. Our lab showed that AHR agonists TCDD and ITE decrease the expression of JAG1 in TNBC cells. AHR knockdown studies also revealed that the decrease in JAG1 expression is AHR-dependent.

Hypothesis

Both TCDD and ITE activate AHR and induce its nuclear translocation where it increases the expression of certain miRNAs that target JAG1 mRNA before it undergoes translation, resulting in the decrease in protein levels and in turn inhibiting JAG1-dependent Notch signaling.

Methods

Western blotting, siRNA transfection, ITE and TCDD treatments, cell proliferation assay, and real time-polymerase chain reaction (RT-PCR)

Results

TCDD and ITE decrease JAG1 protein levels in a AHR-dependent manner. ITE reduces the levels of JAG1 mRNA, while TCDD does not. ITE reduces cell proliferation.

Conclusion

AHR agonists TCDD and ITE have been shown to promote anti-cancer effects in TNBC. Our data shows that both compounds reduce JAG1 protein levels in TNBC, which may play a critical role in their anti-cancer effects. We have also identified that decreases in JAG1 levels in the presence of TCDD and ITE are AHR-dependent. However, there is a difference in JAG1 mRNA regulation between TCDD and ITE. The mechanism by which AHR reduces JAG1 has yet to be identified, but the differences in the JAG1 mRNA between TCDD and ITE treated cells strongly indicate that the expression of micro RNA may be involved.

The Na/K-ATPase signaling in obesity development by lentivirally transfected pNaKtide in C57BL6 mice

Rebecca Martin, Megan Lilly, Jiang Liu, Komal Sodhi, and Joseph Shapiro

Department of Pharmacology, Physiology, and Toxicology, Joan C. Edwards School of Medicine, Huntington, WV.

Background

Obesity is a worldwide epidemic with many comorbidities and complications. It has been demonstrated that oxidative stress can amplify and exacerbate the development of obesity. We have demonstrated that pNaKtide, a Na/K-ATPase signaling antagonist, was able to decrease oxidative stress and adipogenesis by blockage of Na/K-ATPase signaling mediated amplification of oxidative stress. Administration of drugs via a lentiviral vector allows for drug delivery targeting to specific areas of the body, including fat, liver, or cardiac tissue.

Hypothesis

Lentivirally transfected pNaKtide targeting to adipocytes is a potent preventer of oxidative stress, weight gain, and adipogenesis.

Methods

Age matched C57BL6 mice were placed on normal diet or a high fructose western diet (HF/WD) for 12 weeks to induce obesity and adipogenesis. pNaKtide was targeted adipocytes by a specific lentiviral vector, in which GFP was also included in the vector to monitor the expression of pNaKtide. The experimental groups were, 1) normal chow, 2) normal chow + GFP+pNaKtide, 3) HF/WD, 4) HF/WD + GFP, and 5) HF/WD + GFP + pNaKtide

Food and water intake as well as body weight were recorded weekly. 24-hour urine output, oxygen consumption, glucose tolerance, and HOMA-IR will be determined both at beginning and end of the experiment.

At the end of experiment, kidney, liver, heart, and fat samples will be harvested to determine the presence of adipogenic markers and Na/K ATPase signaling markers.

Results

Compared to mice fed with normal chow, mice fed HF/WD showed significant weight gain at week 4. Expression of pNaKtide showed a significant decrease in weight gain compared to HF/WD mice.

Note: This is an ongoing project. We expect to conclude the experiment on February 15, 2017.

Conclusion

Previous data has shown that a HF/WD increases protein carbonylation, and administration of pNaKtide decreases the effect.

The Significance of Na/K-ATPase Signaling and ROS in Obesity

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of Medicine, Huntington, WV

Background

Obesity has reached worldwide epidemic proportions. It is well-documented that oxidative stress is a contributor to the negative prognosis of obesity. The Na/K-ATPase signaling has been shown to be an amplifier of oxidant stress.

Hypothesis

The Na/K-ATPase signaling mediated amplification of oxidative stress contributes to obesity development.

Methods

Murine 3T3-L1 cells were grown in normal maintenance medium (MM). Before treatment, MM was changed to adipogenic medium (AM, supplemented with insulin, dexamethasone, and indomethacin) to cause differentiation of fibroblasts into adipocytes. Different treatments were performed in AM for 7 days. At the end of treatments, cell lysates were prepared using TGH buffer plus protease inhibitors. Western blots for c-Src, Erk, FAS, PPAR γ , CEBP α , and protein carbonylation were performed. ELISAs for adiponectin, IL6, MCP1, and TNF α were also performed. 72 hour conditioned media experiments were done to test for inflammatory markers.

Results

The Na/K-ATPase signaling mediated amplification of oxidative stress (demonstrated by protein carbonylation) stimulated adipogenesis, seen through the increase in adipogenic markers and increase of presence of adipocytes by oil red O staining. pNaKtide, an antagonist of Na/K-ATPase signaling, significantly decrease Na/K-ATPase signaling-stimulated protein carbonylation and adipogenesis.

Conclusion

The Na/K-ATPase signaling contributes to obesity development by amplification of oxidative stress.

The Significance of Na/K-ATPase Signaling in Obesity-induced Hypertension

Yanling Yan, Muhammad A. Chaudhry, Ying Nie, Rebecca Martin, Megan Lilly,
Preeya T. Shah, Fang Bai, Michael Dodrill, Jung Han Kim, Komal Sodhi, Zi-jian Xie
Joseph I. Shapiro, and Jiang Liu

Clinical & Translational Science; Biomedical Sciences

Background

Obesity and hypertension are leading contributing risk factors for cardiovascular disease, and individuals with obesity are at a higher risk of developing hypertension. Systemic oxidative stress is strongly associated with obesity-induced hypertension, but it is not clear if or how the oxidant stress-Na/K-ATPase axis affects obesity-induced hypertension.

Hypothesis

Obesity induces oxidative stress via the activation of Na/K-ATPase signaling, leading to salt-sensitive hypertension

Methods

Two mouse models of obesity were used. One is a diet-induced model of obesity (DIO) in C57BL/6J (B6) mouse and the other is the TALLYHO/JngJ (TH) mouse with moderate obesity.

Aged-matched C57BL/6J mice and TALLYHO/JngJ mice were divided into 2 groups as follows: (1) normal chow; (2) high salt diet (2 days of 2% NaCl, 2 days of 4% NaCl and 2 days of 8% NaCl). Systolic blood pressure monitored by tail-cuff method (using CODA High Throughout Systems, Kent Scientific). Non-fasting glucose levels were measured with glucometer from cheek blood. Body weight was measured every week. Blood pressure, 24h-drinking water volume and 24h-urine sample were collected one day before changing to different high salt diet.

Results

In high fat-induced obese B6 mice, a high fat diet stimulated $\alpha 1$ carbonylation and c-Src activation. The Na/K-ATPase signaling antagonist, pNaKtide, is capable of attenuating $\alpha 1$ carbonylation and c-Src activation (Figure 1). In comparison to wild type B6 mice, TH mice had a higher basal level of $\alpha 1$ carbonylation and activation of c-Src (Figure 1). DIO B6 mice had an increase in blood pressure in response to a high salt diet. Obese TH mice prior to onset of diabetes were also hypertensive in response to a high salt diet, characterized by a reduced slope in renal function curve.

Conclusion

The Na/K-ATPase signaling is implicated in oxidative stress induced obesity hypertension

Using Engineering Methods to Analyze the Effects of Sensory Feedback in Walking

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Dept. Biol. Cybernetics, Univ. Bielefeld, Germany

Background

The nervous system activates muscles in modular groups with similar biomechanical actions (synergists) but the mechanisms underlying this process are not fully understood. Sense organs that detect forces could aid in producing synergies as they have widespread effects in motor neurons to limb muscles. Our previous studies showed that receptors that monitor forces in different locations on the legs of insects act in concert to reinforce muscle synergies in substrate grip.

Hypothesis

The present study tested whether similar synergies were found in all serially homologous legs.

Methods

We imposed forces using waveforms of joint torques that were calculated from recent experiments measuring ground reaction forces in freely walking stick insects.

Results

Application of forces using the torque waveforms calculated by inverse dynamics produced activation of the same muscle synergies in all legs. In addition, discharges of the flexor muscle were sustained and showed little adaptation. Plots of the mean firing frequencies show that motor responses were highest in the hind legs and substantially lower in front legs, similar to the magnitude of the ground reaction forces. The effects on motor discharges were graded and reflected the force magnitude and small variations in forces could elicit compensatory changes in motor activity.

Conclusion

The present study supports the hypothesis that force receptors act to synchronously tune muscle synergies to the levels of load. In addition, synergist muscles do not show the adaptation to torque waveforms seen to ramp and hold functions. These findings demonstrate that application of forces calculated by the engineering method of inverse dynamics can be useful when reapplied to the animal to study the effects of force feedback. Results of these studies may have applications both in neurobiology and in control of walking robots.



CASE STUDY POSTER SESSION II • SPECIAL VIEWING: MARCH 23 at 4:00PM

29TH ANNUAL RESEARCH DAY POSTER SESSION

A Rare Case of Spontaneous Tumor lysis syndrome in Pancreatic Neuroendocrine Tumor

Hassaan Jafri MD, Ali Raufi MD FACP, Toni Pacioles MD

Department of Internal Medicine, Marshall University School of Medicine Department of Hematology/ Oncology, Marshall University School of Medicine.

Background

Tumor lysis syndrome is an oncological emergency caused by release of potassium, phosphorous and nucleic acids into circulation by lysis of tumor cells following the initiation of chemotherapy. It commonly occurs in cases of high grade lymphomas and acute lymphoblastic leukemia. We are reporting an unusual case of pancreatic neuroendocrine tumor (NET) who developed spontaneous tumor lysis syndrome which was never reported before as an association with well differentiated NET of pancreas.

Case Presentation

43 year old man initially presented with right upper quadrant pain and 20 pound weight loss. Computerized Tomography (CT) abdomen showed multiple masses in liver. Biopsy was positive for metastatic well differentiated pancreatic NET. Patient was started on sunitinib for one month but he did not tolerate it well. He was then switched to chemotherapy (Temodar/Xeloda) which he received three cycles and showed initial improvement. However, after six cycles, his disease progressed which was evident on CT abdomen. Patient was then started on monthly lanreotide and later added on everolimus. He presented to the hospital with altered mental status and dull abdominal pain. Labs included potassium 5.6 meq/L, Calcium 5.4 mg/dL, phosphorus 8 mg/dL, LDH 2535 U/L, uric acid 12.7 mg/dL and acute kidney injury. He was placed on fluids and other supportive measures including antibiotics for possible sepsis and pressor supports. He was given one dose of rabsuricase and his uric acid was normalized. His condition worsened despite all management and eventually passed away.

Discussion

Tumor lysis syndrome is common in hematological malignancies and in patient who is receiving chemotherapy. This phenomenon is relatively rare in solid malignancies. The tumor lysis syndrome in our patient make it as a unique case and extremely rare phenomenon due to well differentiation of the neuroendocrine tumor as well as absence of cytotoxic chemotherapy as treatment modality at the time of presentation.

Musical Hallucinations Treated with Atypical Antipsychotics in a Geriatric Population – A Case Series

Dr. Adam Schindzielorz, Dr. Scott Murphy, Dr. Suzanne Holroyd
Psychiatry, Marshall University School of Medicine

Background

Musical hallucinations have been likened to the auditory equivalent of Charles Bonnet Syndrome. They take the form of hymns, and show-tunes and are experienced to emanate from an external source. They are reported to occur in geriatric populations and are associated with hearing impairment, with some studies suggesting a prevalence of 1–4% in this population. Patients usually do not demonstrate psychiatric comorbidity nor have histories of psychiatric illness. Musical hallucinations are typically treated with anticonvulsant and anticholinesterase medications with some studies having evaluated the efficacy of sedative hypnotics, antipsychotics and antidepressants in various psychiatric and medical subpopulations suggesting a heterogeneous group of causes for this disorder.

Hypothesis

We present two cases of musical hallucinations in both a 70-year-old African American female with psychiatric history of major depressive disorder who developed auditory hallucinations superimposed on a primary major depressive episode with psychotic features and an 86-year-old Caucasian female, who complained of hearing music with eventual onset of visual hallucinations after a fall at age 80.

Methods

A literature search of multiple databases was performed using the search terms “musical hallucinations, hearing loss, atypical antipsychotics, anticonvulsants and geriatrics.” Results were compared to our case outcomes in order to support or refute the findings of our reported cases.

Results

Both patients were treated in the inpatient and outpatient settings with aripiprazole and seroquel respectively with resolution of both primary psychiatric symptoms and musical auditory hallucinations.

Conclusion

Our case series adds to the paucity of literature regarding utilization of atypical antipsychotics for treatment of musical hallucinations and demonstrates likely efficacy to this end. This study lends further validity to the use of psychopharmacologic agents for novel purposes that have yet to be fully explored in this patient population and provides further evidence that different classes of medications may have higher efficacy in certain population subtypes.

Adult Meckel's Diverticulum: the Forgotten cause of Adult Gastrointestinal bleeding
Christine Gilkerson, Fikirte Feleke, Teshome Gebrmichael, Fathia Alfakeri, Binyam Gebremedhine
Marshall University , Internal medicine department.

Background

Adult Meckel's Diverticulum: the Forgotten cause of Adult Gastrointestinal bleeding
By Christine Gilkerson, Fikirte Feleke, Teshome Gebrmichael, Fathia Alfakeri, Binyam Gebremedhine

•Abstract

We are reporting a case of small bowel Meckel's diverticulum in a 58-year male patient who presented twice to the hospital with bleeding per rectum.

.Introduction

Meckel's diverticulum is a true diverticulum that arises from the anti-mesenteric surface of mid to distal ileum.

Case Presentation

Case presentation

- A 58-year-old male patient presents to the hospital twice over one-week period with bleeding per rectum. The patient initially had a melanic stools and had Esophagogastrosocopy(EGD) and colonoscopy done by Gastroenterologist showing a normal colon. The patient was then discharged the next day only to return 5 days later with a 4 gram drop in hemoglobin and multiple bloody bowel movement. The patient again had repeat EGD and colonoscopy by Gastroenterologist. colonoscopy showed bleed throughout the colon, at this time they were able to intubate the ileocecal valve and distal ileum and noted blood coming down through the small bowel consistent with small bowel bleed. This finding supported the bleeding scan result of small bowel bleed.
- Hence it was decided that patient needs an intervention with explorative laparotomy and possible bowel resection.
- Finally, patient underwent explorative laparotomy, it was discovered that patient had large small bowel diverticulum approximately 45-50 cm from the ileocecal valve. pathology was consistent wit Meckel's diverticulum.

Discussion

Discussion

- In our patient who is 58-year-old presented with lower Gastrointestinal bleeding as stated in the clinical presentation part. The clinical features of Meckel's diverticulum are nonspecific. Which makes the diagnosis of Meckel's diverticulum difficult especially in adult above the age of 50 years like our patient.

• Conclusion

Meckle's diverticulum should be considered as the cause of GI bleeding in adults too, though it is very rare condition.

A Case Report on Serotonin Syndrome

Shahed Elhamdani, Brandon Lilly, Kelly Melvin

Department of Psychiatry, JCESOM Marshall University

Background

A Case Report on Serotonin Syndrome

Shahed Elhamdani, Brandon Lilly, and Kelly Melvin. Department of Psychiatry, Joan C. Edwards School of Medicine, Huntington, WV.

Serotonin syndrome is a rapidly progressing critical condition caused by increased serotonergic activity in the CNS. It is characterized by a collection of mental status changes, autonomic symptoms, and neuromuscular hyperactivity.

Case Presentation

A 68 year-old Caucasian female with a psychiatric history significant for insomnia and generalized anxiety disorder presented for hospital admission secondary to abdominal pain, vomiting, and diarrhea. The patient reported onset of nausea two days prior to admission that quickly progressed to non-bloody emesis and watery diarrhea. Abdominal CT showed colitis with jejunal distention. The patient was started on piperacillin/tazobactam. Her home medications, which included trazadone, paroxetine, prochlorperazine, ondansetron, and cyclobenzaprine, were continued. Several hours following admission, the patient experienced onset of tremor that rapidly developed into spontaneous, rhythmic muscle contractions involving all four extremities. On examination, her muscle tone was increased and she was found to be tachycardic (168 bpm) and hypertensive (162 mmHg systolic and 81 mmHg diastolic). Neurology was consulted and, following evaluation, rendered a diagnosis of serotonin syndrome. All serotonergic medications were discontinued and the patient was started immediately on cyproheptadine, diltiazem for tachycardia, lorazepam, and IV fluids. Her symptoms improved significantly over the next two days. Meanwhile, psychiatry was consulted the day following the diagnoses for medication recommendations to control anxiety and manage sleep disturbance.

Discussion

The patient complained of generalized worries, nervousness, and insomnia. Hydroxyzine was ordered as needed to control acute anxiety symptoms. Additionally, low dose quetiapine was slowly titrated over several days to three times daily dosing targeting both anxiety and sleep disturbance with notable symptom reduction. Finding the right combination of medications to provide patient relief while avoiding serotonergic effects is key to positive outcomes in patients.

a case of spontaneous disease reactivation limited to the spleen.

Haitem Mezoghi, MD. Ibrahim Shahoub, MD. Zeid Fuad, MD

Internal Medicine

Background

Extra pulmonary sarcoidosis represents approximately 30-50% of patients and rarely affects the spleen.

Case Presentation

We report the case of a 64 years old female, non-smoker who presented with chronic dry cough for a year. Physical examination showed stable vital signs with no superficial adenopathy, skin rash or clubbing. Cardiorespiratory examination was within normal and no organomegaly or edema was detected.

Imaging studies revealed bilateral mediastinal adenopathy and apical parenchymal scarring. TB and rheumatologic disease as RA, systemic sclerosis and MCT were ruled out. PFT studies showed mild restrictive impairment with mild decrease in diffusion capacity. She was monitored with yearly Chest CT and PFT as she had refused invasive work up. She eventually underwent FOB with transbronchial lung biopsy and Endobronchial Ultrasound LN biopsy that revealed chronic granulomatous inflammation. Subsequent follow-up CT-scans of her chest showed stable apical parenchymal scarring and less hilar lymphadenopathy. On most recent study from few months ago, new multiple lesions were seen involving the spleen. Positron Emission Tomography (PET scan) was performed and revealed a significant uptake corresponding to these lesions with no other areas of abnormal uptake. CT-guided biopsy of splenic lesion was performed to exclude unrelated or new disease process such as lymphoma and it showed non-caseating granulomas consistent with sarcoidosis.

Discussion

Although, sarcoidosis can affect any organ in the human body, it is rarely found to affect the spleen. Diagnosis is usually made with characteristic imaging findings, PET-scan and biopsies in some cases. To the best of our knowledge there has been only 11 cases of splenic sarcoidosis reported in English literature. After few years of quiescent disease course, our patient had reactivation of disease that was limited to the spleen without previous involvement of this organ. She was treated with a course of steroids and she will undergo follow-up imaging studies for reevaluation.

A Case of Successful Pregnancy after Postpartum Cardiomyopathy

Amanda J. Krauss and Adam M. Franks.

Department of Family Medicine, Joan C. Edwards School of Medicine, Huntington, WV.

Background

Postpartum Cardiomyopathy is a rare complication in which a patient develops left ventricular dysfunction at the end of pregnancy or shortly after delivery. Patients present with dyspnea and orthopnea, common complaints in pregnancy, which can be misdiagnosed with this condition. The high mortality associated with postpartum cardiomyopathy requires prompt monitoring and treatment. Women who develop postpartum cardiomyopathy are advised against another pregnancy because of the risk of recurrence or further decline, as the heart frequently is unable to fully recover from the left ventricular dysfunction and a subsequent pregnancy will produce stress on an already cardiovascularly compromised heart.

Case Presentation

This is a case of postpartum cardiomyopathy in a 25-year-old female patient who presented with gestational hypertension and reduced ejection fraction. After the diagnosis of postpartum cardiomyopathy, with close medical management, she attained an ejection fraction between 45-50%. Eighteen months after the initial presentation and diagnosis of postpartum cardiomyopathy, she became pregnant and subsequently delivered without complications. This case is consistent with other studies that suggest that although there are risks involved with a successive pregnancy, restoration of ejection fraction is an indicator of a favorable prognosis in the subsequent pregnancy.

Discussion

Finally, this case highlights the importance of access to care, particularly in regards to rural West Virginia. Rural West Virginia represents a medically underserved population, where access to primary care can be difficult to achieve, increasing the chances of postpartum cardiomyopathy being misdiagnosed or underdiagnosed. Furthermore, because of the high mortality risk, access to cardiac monitoring is also necessary in order to appropriately handle the cardiovascular dysfunction. Because rural West Virginia is medically underserved, the risk of mortality as a result of postpartum cardiomyopathy may be further increased.

A Benign Presentation to a Dismal Outcome: A Rare Presentation of Malignant Melanotic Schwannoma of the Sacrum

Shahed Elhamdani, Muhammad Jamil, Rida Mazagri

Department of Neurosurgery, JCESOM Marshall University

Background

A Benign Presentation to a Dismal Outcome: A Rare Presentation of Malignant Melanotic Schwannoma of the Sacrum

Shahed Elhamdani, Muhammad Jamil, and Rida Mazagri. Department of Neurosurgery, Joan C. Edwards School of Medicine, Huntington, WV.

Malignant melanotic schwannoma is a rare neurological tumor that usually presents with severe neurological sequelae. There are very few reported cases of this tumor and even fewer within the sacrum.

Case Presentation

JM is a 30 year old patient who presented to his primary care physician complaining of lower back pain after lifting a heavy object. His PCP recommended physical therapy and over the counter pain medications to help manage. The patient obliged for several weeks but showed no improvement. MRI revealed a large mass in the sacrum. Biopsy was performed, and the mass was determined to be malignant melanoma. The patient was referred for dermatology and PET scan to evaluate for the primary lesion, but it could not be identified. Recommendations were made to begin chemotherapy treatment while plans were made to pursue neurosurgical resection of the tumor. A second opinion was requested from Mayo Clinic pathology. They made a diagnosis of malignant melanotic schwannoma, a very rare neurological tumor, based on the pathology. The patient has transferred his care to Cleveland Clinic. He has started to experience mild paresthesia in his legs but is otherwise asymptomatic.

Discussion

The significance of this case is in the uniqueness of the malignancy and the seemingly benign presentation of the patient. This patient may have easily been dismissed for a benign pathology upon initial presentation; however, proper workup ultimately led to the appropriate diagnoses. Intervention at this point before the development of severe neurological symptoms may preserve some neurological function.

A Novel Hydrogel Spacer Results in Minimal GI Toxicity following Prostate Cancer Radiotherapy in the setting of Comorbid Crohn's disease

Raj Singh, Philip S. Jackson, Sanjeev Sharma

Department of Radiation Oncology, Joan C. Edwards School of Medicine, Marshall University, Huntington, WV; Department of Radiation Oncology, St. Mary's Medical Center, Huntington, WV

Background

Radiotherapy (RT) is commonly used in the treatment of clinically localized prostate cancer (PCa). However, disadvantages of RT include possible GI symptoms. This is especially relevant for patients with inflammatory bowel disease (IBD), as RT is generally considered to be contraindicated due to the risk of bowel toxicity. We present one of the first cases of a PCa patient with IBD treated with RT and a hydrogel spacer.

Case Presentation

On routine examination, a 73-year-old male was found to have a PSA of 4.03 ng/mL while on finasteride. The elevated PSA prompted a biopsy and subsequent staging studies (CT of abdomen/pelvis and bone scan) that led to a diagnosis of T1cN0M0 high-risk prostate adenocarcinoma due to Gleason 9 component.

The patient's past medical history was significant for Crohn's disease (CD) diagnosed 8 years prior with colonoscopy and biopsy confirmation. Given the patient's history of CD, one week prior to RT the SpaceOAR® system was utilized. The SpaceOAR is a polyethylene glycol hydrogel that is injected into the perirectal fat and solidifies into an absorbable spacer that separates the prostate and the rectal wall. The injected hydrogel yielded a roughly 1.14-1.21 cm. space between the anterior rectal wall and the prostate gland. The patient then received RT (78 Gy/2 Gy fractions at a 100% isodose line) over 8 weeks.

Over the course of treatment, mild diarrhea with no associated pain or cramping was noted during the 5th and 6th weeks of treatment. At 3-month and 6-month follow-ups, bowel movements were reported as being back to baseline with no complaints of diarrhea, constipation, or abdominal pain and a PSA of 0.18 ng/mL.

Discussion

This case report suggests that IBD patients with clinically localized PCa and favorable prognostic factors may be viable candidates for RT given the promising results of hydrogel spacers in limiting rectal toxicity.

A Shocking Cause of Placental Abruption

J. Wes Urian and Adam M. Franks

Department of Family Medicine, Marshall University Joan C. Edwards School of
Medicine, Huntington, WV

Background

Electrical shock during pregnancy is an infrequent accident with limited reports in the literature. Of those incidents reported, varying sequela have occurred in relation to both maternal and fetal well being. This has led to numerous recommendations for monitoring and differing evaluations on the risks involved. While an elevated estimate of the dangers involved in such incidents can be attributed to the lack of publications reporting normal outcomes, a case-by-case approach factoring in both the physics of electricity (with Ohm' Law interplay of Voltage and Resistance) and the historical circumstances intrinsic to the exposure (such as the likely current pathway through the individual), can help physicians make a better determination of the potential threats. This can aid in the formulation of treatment and care plans for the mother and the fetus.

Case Presentation

To illustrate this, we present the case of a 27-week pregnant woman who experienced an electric shock from dry skin exposure to alternate current while barefoot and the subsequent placental abruption that led to oligohydramnios. With an understanding of the parameters of exposure and the physics of electric currents, appropriate surveillance methods were instituted leading to a successful delivery at 37 3/7th weeks.

Discussion

While some cases of electrical shock in pregnancy have seen no harm to the fetus or mother, both serve as potential victims. Therefore, we illustrate the present case and approach to render possible recommendations and educate physicians on the underlying mechanisms and risks involved in these electrical shock accidents.

ACQUIRED GERBODE DEFECT INVOLVING THE MITRAL VALVE

Shah, Cansino

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Background

Gerbode defect is a rare intracardiac shunt between the left ventricle and right atrium which can be congenital (type I defect) and in even rarer cases, can be acquired (type II defect), as a complication of endocarditis, myocardial infarction, chest trauma, or post previous cardiac surgery. Cases secondary to endocarditis are commonly a result of *Staphylococcus aureus*, involve the aortic or tricuspid valve, and mortality rates are as high as 13.6%. We present an acquired Gerbode, type II, defect due to mitral valve endocarditis, where the echocardiographic assessment was essential to the patient's management and survival. To our knowledge, this type of case has not been reported in the literature.

Case Presentation

49-year-old male presented to an outlying hospital for second degree burns involving 18% of his total body surface area. He was transferred to our facility for further care and was treated with multiple debridements. The patient subsequent developed endocarditis secondary to methicillin resistant *Staphylococcus aureus* (MRSA) and subsequent transesophageal echocardiogram revealed a large vegetation and perforation of the A3 leaflet of the mitral valve, leading to subsequent severe mitral regurgitation, with fistula formation to the right atrium, consistent with Gerbode defect. Due to hemodynamic instability, he was transferred to higher level of care for surgical repair of the Gerbode defect.

Discussion

We present a type II Gerbode defect, involving the mitral valve, which has not been previously described in the literature. We hypothesize that the infection traveled from the anterior valve of the mitral leaflet and through the membranous portion of the interventricular septum, leading to a perforation, creating an intracardiac shunt. This theory was further supported by color flow on echocardiogram and confirms that mitral valve endocarditis can lead to a type II Gerbode defect.

Amantadine Might be Effective in Early Conscious Disorder After Multifocal Ischemic Stroke Involving the Brainstem

Brooke Andrews, Justin Nolte, Dennis Cole, Christopher Fitzpatrick

Department of Neurology, Department of Internal Medicine, Joan C. Edwards School of Medicine, Marshall University School of Pharmacy

Background

Amantadine, an antiparkinsonism and antiviral agent, has historically been used in the treatment and prevention of influenza, although presently, it's used alone or in combination for dyskinesias and other extrapyramidal side effects related to Parkinson's disease and other forms of Parkinsonism. Furthermore, it has been documented in cases to stimulate brain healing, and has shown improvement in patients with traumatic brain injuries (TBI).

Case Presentation

Early conscious disorder (ECD) is a condition of impaired conscious following an ischemic stroke that has been shown to occur more frequently in older patients, those with larger infarct size, and in patients with strokes involving the cortex and the brainstem. Previous studies have shown that the 3-6 month morbidity and mortality for patients with ECD is higher than if ECD is not present within the first 24-48h after onset of ischemic stroke. We present a patient who presented with obstructive hydrocephalus due to a colloid cyst obstructing bilateral foramen of Monro leading to diffuse cerebral edema and multifocal ischemic strokes including the bilateral thalami and rostrum of the midbrain seen on MRI brain. After decompression of the hydrocephalus with a ventriculostomy catheter he remained in a comatose state and was started on Amantadine with clear improvement in his level of consciousness. The Amantadine was stopped since he had improved, and it appeared he did not need the medication further. At that point his level of consciousness declined, but then yet again improved upon the reinstatement of Amantadine.

Discussion

To our knowledge this response to Amantadine in the setting of ischemic stroke affecting the bilateral thalami and rostrum of the midbrain has not been previously reported. The benefits Amantadine gave this patient with multifocal ischemic strokes was shown to be crucial, and may suggest further indications for Amantadine in ECD.

An Unusual Case of Two Genetic Diseases of Liver in Same Patient

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Background

Hereditary hemochromatosis (HH) and alpha 1 antitrypsin deficiency (AATD) are common genetic diseases of the liver. We report a 34 year-old male with both diseases; something we felt was rare. A literature review showed that there is no genetic relationship between these conditions. We are presenting this case to increase awareness about the possibility of the simultaneous presence of two hepatic disorders of genetic origin.

Case Presentation

A 27 year-old male presented to our clinic for primary care. He did not have a history of alcoholism or liver disease. The patient's physical exam was normal. Laboratory evaluation showed mildly elevated AST, ALT and alkaline phosphatase. Further investigation revealed a low alpha 1 antitrypsin level. Genetic testing showed an MZ phenotype. Investigation for other causes of elevated liver enzymes was negative with the exception of mild fatty infiltration on ultrasound. The patient was followed with serial enzymes levels and was re-evaluated when he developed a sudden elevation of liver enzymes that was due to acute mononucleosis. However, because of an elevated ferritin, phenotyping was completed revealing an H63D homozygous mutation for hemochromatosis.

Discussion

HH and AATD occurring together has been reported, but whether a relationship exists between the two diseases is unclear. They are both common hereditary diseases so some claim the simultaneous occurrence is entirely by chance. One study showed that the frequency of AATD is not increased in patients with genetic HH compared to that of the general population. Physicians should be aware that more than one liver disease process might occur in the same patient and they should look for another disease when the clinical picture is suggestive.

Aneurysmal Subarachnoid Hemorrhage in a Term Gravidia: A Case Report

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Background

The incidence of subarachnoid hemorrhage during pregnancy is estimated to be 1 in 10,000 patients. Headache in pregnancy is a common complaint of patients and is a neurologic sign that is shared between many diseases. This can make diagnosis of a subarachnoid hemorrhage difficult.

Case Presentation

A 41 year old G2P1001 at 38.5 weeks gestational age presented as a transport from another facility for a headache. She was seen in the emergency room of her local hospital and was given recurrent doses of morphine and an occipital nerve block. The only imaging study completed at that time was a biophysical profile. She was transported to our facility when her symptoms failed to resolve. The patient was found to have symptoms of an intermittent headache behind her eyes and neck pain that was exacerbated by movement and relieved by pressure and massage. The patient received a non-contrast computed tomography scan that revealed a subarachnoid hemorrhage suspicious for aneurysm rupture. Neurosurgery and interventional radiology were consulted and the decision was made for an emergency caesarean section. After delivery, the patient was taken to the interventional radiology suite. The patient was found to have a ruptured 3mm left paraophthalmic artery aneurysm and also was found to have a nonruptured 4mm right paraophthalmic artery aneurysm. The patient was then transported to the ICU in stable condition. She continued to improve and was discharged on post-op day 7 with follow up in 1 month for right paraophthalmic aretery aneurysm coiling.

Discussion

This case demonstrates the unique therapeutic challenges in treating a patient with a subarachnoid hemorrhage during pregnancy. Morbidity and mortality of the mother and infant is extremely high if the correct diagnosis is not made. Management is the same as in the non-pregnant patient with the exception of delivery if at an appropriate gestational age.

Bilateral Temporal Changes on MRI: A case of neurosyphilis mimicking herpes simplex encephalitis and clinical review summary

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Background

Syphilis is a sexually transmitted disease caused by the spirochete *Treponema pallidum*. Despite the well-established treatment regimen by antibiotics, syphilis has not been eradicated due to lifestyle changes. Neurosyphilis is the tertiary syphilis that infects the central nervous system by *Treponema pallidum*. Some studies have reported atypical forms of neurosyphilis that mimicked herpes encephalitis.

Hypothesis

Patient with cognitive changes and Magnetic resonance imaging (MRI) brain scan findings compatible with a diagnosis of herpes simplex encephalitis should be aware of potential differential diagnosis of neurosyphilis.

Methods

Comprehensive workup was done in a case of a 74 year-old male with MRI brain scan findings compatible with a diagnosis of herpes simplex encephalitis with negative testing for herpes simplex virus in the cerebral spinal fluid. An extensive literature has also been performed and data was analysed.

Results

Patient had intermittent dizziness and slight dementia otherwise he was largely asymptomatic. Serum TPPA is reactive and serum RPR is also positive, whereas serum HIV test was negative. Cerebral spinal fluid showed elevation of protein concentration at 73 mg/dl. His clinical picture was consistent with neurosyphilis. He was treated with continuous intravascular infusion of penicillin G 24 million units for 14 days and followed up with Infectious Disease clinic.

Conclusion

An extensive review of the literature has been undertaken revealing about 40 cases worldwide where there are temporal changes on MRI concurrent with a diagnosis of neurosyphilis. Most of them are male with negative HIV test. Therefore, it is now well established that neurosyphilis should be considered in the differential diagnosis in all patients who had temporal changes on MRI which usually were seen in herpes simplex encephalitis.

CADASIL: a case report and review

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Background

Cerebral autosomal dominant arteriopathy with subcortical infarcts and leukoencephalopathy (CADASIL) is an autosomal dominant inherited microangiopathy. CADASIL is characterized by migraines and cerebrovascular changes. It is the most common type of hereditary vascular dementia and is caused by NOTCH3 mutations. Regional studies have shown the prevalence to be at 1.98 to 4.6 per 100,000 adults.

Case Presentation

A 49-year-old female presented with a chief complaint of headaches. Her migraines began nine years ago. She has ~6 severe migraines per year, sporadically accompanied by vertigo. These headaches are associated with photophobia, phonophobia, nausea, dysarthria, and partial vision loss. She also experiences tension-type headaches that occur monthly and last approximately one week. She has a past medical history significant for coronary artery disease, anemia, and claustrophobia. The patient's family history is significant for suspected CADASIL and colon cancer in her mother, a cerebrovascular accident in her sister, and anecdotally positive CADASIL testing in her niece.

Her vitals were within normal limits. Cranial nerves were grossly normal, and she displayed no focal weakness or sensory deficits. Deep tendon reflexes, rapid alternating movements, and coordination were appropriate and symmetric. Her gait displayed normal stride length and pace.

Magnetic resonance imaging revealed extensive bilateral deep periventricular supratentorial white matter signal abnormalities suggestive of a chronic demyelinating disease. Differential diagnoses included CADASIL, white matter changes secondary to leukoaraiosis, vasculitis, or multiple sclerosis. Genetic testing of the NOTCH3 gene revealed a pathogenic cytosine to thymine point mutation which confirmed the CADASIL diagnosis.

Discussion

CADASIL, though rare, may be under-recognized and underdiagnosed. Physicians need to consider CADASIL in a young-to-middle aged patient with migraines, characteristic MRI changes, and early-onset stroke or dementia especially in those patients without the presence of traditional vascular risk factors. The proper identification of affected patients is important for potential genetic counseling.

Can Antipsychotics Trigger Polymyositis

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Background

Polymyositis is rare connective tissue disease that causes symmetrical proximal muscle weakness, elevated skeletal muscle enzyme levels, and characteristic electromyography (EMG). It is of an unknown etiology. We present a unique case of newly diagnosed polymyositis in which the diagnosis was confounded by the recent initiation of an atypical antipsychotic (Geoden).

Case Presentation

A 24 year old female with history of asperger presented with proximal muscle pain and weakness of the upper and lower extremity. The symptoms started after the initiation of Geoden three weeks prior to the presentation. Four months prior, the patient developed shortness of breath and dry cough. Although bacterial pneumonia was initially suspected, the patient's condition worsened despite wide spectrum antibiotics. The patient was treated with systemic steroids empirically with improvement of her symptoms and a provisional diagnosis of pneumonitis was made. Patient developed steroids induced psychosis in the weeks that followed, steroids were stopped, and patient was started on the antipsychotic Geoden. Patient has been evaluated by a rheumatologist one month prior to admission for a possible autoimmune disease explaining her pneumonitis event but an extensive work up came back negative. Early in the admission, the patient was thought to have antipsychotic induced myopathy. The antipsychotic was discontinued. Further work up revealed CPK (2834), myoglobin (1249), +ANA, and +Anti-jo 1. Polymyositis was tentatively diagnosed by a rheumatologist and the patient was started on an immunosuppression.

Discussion

The possibility of polymyositis exacerbation by antipsychotics and the possible overlap between autoimmune muscle injury and drug induced myopathy might be challenging to recognize. Certain medications and environmental factors may have an influence on the occurrence of polymyositis. Establishing a cause-effect relationship between a certain factor and disease induction is not always simple. The lack of previously diagnosed autoimmune disease is important. High index of suspicion is required for diagnosis.

"Case Report Exploring the Link Between Capgras Delusions and Left Temporal Dysfunction"

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Background

Capgras syndrome is a delusional disorder characterized by the belief that a person, usually a close friend or family member, has been replaced by an imposter. The etiology of this disorder is unknown, but one area of research points toward a miscommunication between the temporal lobe -- the area of the brain in part responsible for memory and facial recognition -- and the limbic system, which is involved in emotional regulation. Other case studies have reported Capgras syndrome associated with dorsal right hemisphere dysfunction, which suggests that the region responsible for the perception of auditory tones may be involved. Yet another case study examined the brain of an individual with Capgras syndrome using functional SPECT imaging, and this revealed increased perfusion of the occipital lobe. Interestingly, each of these studies seems to pinpoint a discrete region of the brain as the likely root of Capgras symptoms. We report on a case of Capgras syndrome that is associated with left temporal lobe dysfunction.

Case Presentation

Ms. G, a 57-year-old female, presented with Capgras syndrome 2 years ago when her adult son returned home after a lengthy absence. Upon reuniting, Ms. G suddenly believed that her true son was gone, having been replaced by an identical-looking stranger. This delusion has remained for 2 years, and although she has learned to accept the "new son" she will readily state that he is not her real son and becomes upset wondering where her "real" son is now. Ms. G has no history of traumatic brain injury, dementia, or schizophrenia; however she has had several years of mild forgetfulness. An MRI was normal. An electroencephalogram (EEG) showed signal slowing in the left temporal lobe.

Discussion

In this report, we present our case in detail and review the current literature pertaining to possible brain regions associated with this condition.

Case Report of Neuroleptic Malignant Syndrome

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Background

Neuroleptic Malignant Syndrome (NMS) is a rare condition clinically characterized by muscle rigidity, hyperthermia, autonomic instability, and acute mental status change. NMS is most often caused by neuroleptic medications such as antipsychotics. Typically, first generation antipsychotics have greater association with NMS compared to second generation antipsychotics. NMS can be fatal with mortality rates as high as 15-20% without timely recognition and appropriate treatment.

Case Presentation

A 54 year-old male with past medical history of Intellectual disability, Schizophrenia, Post-traumatic stress disorder, Parkinson's disease, Gastroesophageal reflux disease, and Seizure disorder presented to the emergency department (ED) from an assisted living facility with fever and nausea/vomiting of 2-3 days duration and ultimately was thought to have sepsis with unknown source, for which he was admitted. The following day, the patient developed increased muscle rigidity, tachycardia, tremors, elevated temperature, tachypnea and hypoxemia. He also developed leukocytosis and elevated serum creatine kinase. Medical record from the assisted living facility indicated that the patient had received haloperidol PRN prior to presenting to the E.D. A diagnosis of NMS was made and the patient was treated accordingly with dantrolene and supportive care. He was placed on mechanical ventilation for airway protection. Once extubated, his psychosis resumed including auditory and visual hallucinations, which was initially managed with carbamazepine and lorazepam. However psychosis and agitation worsened and was physically aggressive. Delirium workup was found to be unrevealing. Pt was then started on low dose quetiapine. This appeared to adequately control his psychosis and he returned to his baseline mentation.

Discussion

This case illustrates importance of early recognition of signs and symptoms of NMS and the need to promptly initiate treatment in order to prevent complications including death. The case also highlights decision to resume atypical antipsychotics, which can be done safely if started at low dose coupled with close observation of patient.

Cryptococcus meningitis in immune-competent patient

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Background

Cryptococcal meningitis is a serious opportunistic infection which is the most frequent central nervous system (CNS) fungal infection in AIDS patient. In this case we will present a Cryptococcal meningitis in immune-competent patients.

Case Presentation

This is a 71-year-old white male with past medical history significant for Cerebellopontine angle tumor. He was presented to his Neurosurgeon with history of frequent falls secondary to abnormal gait, associated with vertigo, tinnitus, as well as visual changes. Also, he mentioned nighttime sweating and weight loss. Patient was admitted after MRI brain showed leptomeningeal enhancing nodules at the subarachnoid space. LP was performed with evidence of growing *Cryptococcus* on CSF. *Cryptococcus meningitis* diagnosis was confirmed and Patient was treated with Amphotericin B and fluconazole. MRI head repeated as follow up showed dramatic improvement.

Discussion

Approximately 957,900 cases of *Cryptococcus meningoencephalitis* are reported each year. It is most commonly affecting patient with low immunity ($CD4 < 100$), patient on corticosteroids, and organ transplant patients. There are two types of *Cryptococcal meningoencephalitis*; *C. neoformans* var *grubii* and *C. neoformans* Var *neoformans*. The patient who suspected to have *cryptococcal meningitis* should have Cerebrospinal fluid worked up including India ink smear, fungal culture, and *cryptococcal antigen* testing.

Treatment for *cryptococcal meningitis* is similar in both immunocompetent and in immunocompromised patients. Usually started with Amphotericin and flucytosine for 2 weeks, followed by fluconazole for minimum of 8-10 weeks. It is very important to Monitor CSF pressure during the initial phase of therapy and to keep opening pressure less than 250 mm H₂O. The mortality rate is high if not treated or no prophylaxis provided to immunocompromised patients.

**DIPNECH (Diffuse Idiopathic Pulmonary Neuroendocrine Cell Hyperplasia) A
Rare Case Involving the Trachea**

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Background

DIPNECH is a rare primary pulmonary disorder with good prognosis and is a preneoplastic condition for carcinoid tumors with around 100 cases reported in the literature. It is being recognized with increasing incidence and is considered the initial manifestation of pulmonary neuroendocrine disease.

Case Presentation

A 50 year old non-smoker woman with history of shortness of breath for 2 years after which she was diagnosed with asthma, presented to an urgent care with increase shortness of breath. During that time she was treated with inhalers and antibiotics without improvement after which she decided to follow up with a primary care physician. Chest X-Ray was performed and demonstrated a curious right mid lung zone mass. CT chest demonstrated two well-circumscribed lung masses within the right middle lobe (RML) and right lower lobe (RLL). Pulmonary function test was normal.

Bronchoscopy was performed and revealed a partially obstructing endobronchial mass in the anterior basal segment of the RLL. Endobronchial fine needle aspiration and surgical lung biopsy showed low grade neuroendocrine tumor most consistent with carcinoid neoplasm. A curious small non-obstruction and hyperemic lesion was found proximally in the upper Trachea and biopsy showed inflamed cartilaginous airway with thickened basement membrane and neuroendocrine cell hyperplasia though not carcinoid. Patient was underwent bilobectomy with regular airway surveillance for tracheal finding.

Discussion

DIPNECH is a rare disorder with predilection for middle-aged, non-smoking women. Diagnosis is challenging and frequently delayed for years due to insidious presentation and is often confused with asthma. High degree of suspicion is needed for early diagnosis, management and long-term observation of patients with this disorder that can progress to severe airway obstruction and even death.

Our case is unique given that DIPNECH is a very rare and underdiagnosed pulmonary disease and to our knowledge, this is the first reported case of DIPNECH involving the Trachea.

Extensive Pleural Plaques Due To Exposure to Embalming Fluid

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Background

Pleural plaques are focal areas of pleural thickening due to deposits of hyalinized collagen fibers commonly seen on chest imaging. They result from chronic inflammation of the parietal pleura and indicate asbestos exposure almost exclusively. Rarely they can be seen in entities such as Erdheim-Chester disease, and diffuse pulmonary lymphangiomatosis.

Case Presentation

89 years old white male presented with progressively worsening chronic shortness of breath. Patient denied any chest pain, cough, fever or orthopnea. Pt had significant prior medical history of CAD with stents, HTN, and hyperlipidemia but no known lung disease. Patient smoked only 6 months his early twenties, more than 60 years ago. No prior drugs no alcohol abuse. Patient worked almost all his life as embalmer. Patient denied any asbestos exposure despite extensive questioning. He never worked in coal mines or any other toxic environment. His exam was significant for hypoxia requiring 2 L O₂ supplementation. Chest exam revealed decreased breath sounds on the right. There was no JVD or lower extremities edema. CXR showed extensive bilateral calcified pleural plaques, and right side pleural effusion. Chest CT scan confirmed those findings. Patient was admitted for further work up. Thoracentesis yielded exudative fluid with negative cultures and cytology examination. Patient was discharged home but was readmitted few days later with relapsed dyspnea and recurrent right pleural effusion. Thoracic surgery was consulted and performed VATS procedure with extensive biopsies and decortication. Pathological exam of the resected pleura showed calcified plaques but no specific pathology.

Discussion

Our patient had no asbestos exposure. Despite extensive investigation and consultation with national experts in pleural disease we could not find known etiology for his disease. The only plausible explanation was the association of his disease with extensive exposure to embalming fluid. Further investigation into which embalming component is the culprit and at what dose/duration is needed.

Gemcitabine-induced necrotic patterns of disease

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Background

Gemcitabine is a chemotherapeutic drug for the treatment of solid tumours such as ovarian, breast, bladder, pancreatic, and non-small cell lung cancer. It has a milder toxicity profile in comparison with another pyrimidine analogue, cytarabine. Adverse effects include myelosuppression, elevation of hepatic enzymes, flu-like symptoms, nausea, vomiting, and rash. We present a 74-year-old male with pancreatic adenocarcinoma, status-post pancreaticoduodenectomy, who developed a rare case of skin necrosis of the lower leg after completing 6 cycles of single-agent gemcitabine treatment.

Case Presentation

A 74-year-old Caucasian male with a T3N1M0 well-differentiated pancreatic adenocarcinoma presented after pancreaticoduodenectomy, successfully performed in September 2015. He then presented to clinic 3 months after surgery to initiate monotherapy gemcitabine. His regimen entailed 6 cycles of 1820 mg (1000 mg/m²) IV infusion over 30 minutes on days 1, 8, and 15 of a 28-day cycle. It was during the last treatment day of the sixth cycle that he presented with worsening erythema, pain, and swelling of the right calf. He was admitted to the hospital and was initially given cefepime and vancomycin treatment. Due to its presentation, this was thought to either be infective cellulitis or a skin necrosis due to gemcitabine.

Discussion

Skin necrosis is a very rare adverse effect of gemcitabine. There is only one other similar case that has been reported. Resolution was achieved after discontinuation of gemcitabine treatment and application of wound care. Necrotic patterns of diseases associated with gemcitabine are necrotizing vasculitis, digital necrosis, necrotizing enterocolitis, and myonecrosis. Hypothesized mechanisms leading to these disease patterns include extravasation into the surrounding tissues, an autoimmune predisposition and immune complex deposition, endothelial damage of blood vessels due to drug toxicity, and paraneoplastic syndrome. An autoimmune screen may be warranted in presentation of necrotic disease with gemcitabine. Gemcitabine may also trigger radiation recall reactions in patients who undergo radiotherapy.

Glioblastoma Multiforme with extracranial metastases to the pleura, liver and bone

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Background

Glioblastoma multiforme (GBM) is a malignant, fast growing and highly aggressive primary central nervous system (CNS) tumor with poor prognosis. GBM typically remains confined to the brain or spinal cord. Pleuropulmonary metastasis from an intracranial glioblastoma is exceedingly rare and occurs mostly with primary site progression. Herein, we report a rare case of previously diagnosed GBM presented 6 months later with extra-CNS metastases to the pleura, liver and bone without primary site recurrence.

Case Presentation

A 56 y/o Caucasian male had been diagnosed with temporal lobe grade IV glioblastoma six months prior to his presentation. His large 4 x 3 cm cystic and necrotic mass had been treated with excision followed by concurrent chemoradiation and was maintained on Temazolamide. Six months later, A CT of the chest showed large pleural effusion with pleural thickening and nodular appearance on the right. There was a new hypodense lesion in the superior part of the liver measuring 2.7x2.3cm with multiple lytic bone lesions. Medical thoracoscopy was performed and showed classic pleural studding suggestive of metastatic disease. Pleural biopsies using the rigid optical forceps confirmed the metastatic disease.

Discussion

GBM is the most common malignant primary brain tumor and typically remains confined to the brain or spinal cord with low potential to metastasize outside the central nervous system. The most common sites of metastases outside the CNS are pleura/lung, lymph nodes, bones and liver. The number of reported cases of metastatic GBM in the literature has steadily increased from 0.44% to about 2% with the majority of patients being reported after 1980. On average, Metastases appear 8.5 months after first GBM diagnosis.

Our case is unique given the early presentation of the metastatic disease (6 months after diagnosis). It occurred without a primary site recurrence and the method of diagnosis using medical thoracoscopy.

Hemoglobin Wayne Variant Interfering with Hemoglobin A1c Measurement

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Background

According to the American Diabetes Association since 2010, diabetes mellitus can be diagnosed based on two consecutive measurements of A1c $\geq 6.5\%$. However, certain hemoglobin abnormalities can confound A1c measurements through various mechanisms. We present a case of falsely elevated A1c levels due to the rare hemoglobin Wayne variant.

Case Presentation

A 67-year-old female patient was referred to endocrinology clinic for management of uncontrolled diabetes mellitus. She was diagnosed with type 2 DM nine years ago, and was started on glipizide by her primary care physician, which was titrated up to 10mg daily. At initial endocrine visit, her A1c was 11.6%; multiple repeat A1c consistently showed her to be $>11\%$. As part of diabetes management, she was asked to log her blood glucose levels regularly. After reviewing her blood glucose log it was noted that the patient had frequent hypoglycemic episodes and there was discrepancy between her A1c levels and her blood glucose readings, which were ranging from 54 to 128 mg/dl. Due to recurrent hypoglycemic episodes, glipizide was titrated to 2.5mg daily and then stopped when she reported episodes of severe hypoglycemia. Metabolic workup was within normal limits. The patient insisted that she was following physician recommendations and prescriptions properly. It was at this point that we shifted our attention to a potential confounder. Hemoglobin electrophoresis was ordered to look for hemoglobinopathies; the results showed that our patient had a hemoglobin Wayne trait. When A1c was repeated with the appropriate immunoassay, her A1c was actually 6.2%.

Discussion

This case not only presents this rare and interesting hemoglobin variant but also reminds providers that A1c testing is susceptible to misinterpretation due to multiple interfering factors. With the proper awareness and improved patient-physician communication, providers may avoid the mismanagement of both diabetic and nondiabetic patients and avoid risk of hypoglycemia through unnecessary antihyperglycemic medications.

Heroin-induced toxic leukoencephalopathy in Appalachia: A case report and literature review

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Background

The abuse of prescription and illicit opioids has increased dramatically over the past decade. One rare and potentially lethal complication of heroin use is heroin-induced toxic leukoencephalopathy (HITL). HITL most often occurs following the inhalation of heroin vapors. We describe the case of a 36 year-old male with altered mental status whose workup revealed HITL.

Case Presentation

Mr. S, a 36 year-old Caucasian male with a history of opioid use disorder, presented to the emergency department after being found at home confused and mute. He was in his usual state of health four days prior. Neurologic examination showed jerking of right upper and lower extremities persisting during sleep, increased tone on right side, mutism, and inconsistent ability to follow commands. On psychiatric examination, Mr. S was frustrated at his inability to communicate. Initial workup was unrevealing. Urinalysis and urine drug screen were negative, and lumbar puncture results were normal. Initial MRI results suggested drug-induced toxic leukoencephalopathy. Additional history revealed that Mr. S had used been inhaling heroin vapors the evening prior to symptom onset. The patient was hospitalized for a total of six weeks including physical rehabilitation. His right-sided jerking and weakness improved with residual mild parkinsonian tremor. Receptive communication mildly improved though his expressive language remained impaired. Repeat MRI seven months later demonstrated worsened white matter changes bilaterally.

Discussion

The case of Mr. S illustrates one possible presentation, course, and outcome for HITL. While some individuals recover completely, others suffer lasting neurologic deficits and some undergo a course that progresses to death. Neuroimaging can be very useful for diagnostic purposes but symptom severity correlates poorly with radiologic findings. Although uncommon, HITL will likely be encountered more frequently as a consequence of the overall rise in heroin use.

Idiopathic intracranial hypertension as a manifestation of adrenal insufficiency in a child on inhaled corticosteroids

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Background

Certain endocrine disorders were reported to be associated with idiopathic intracranial hypertension. Although adrenal insufficiency following withdrawal of inhaled corticosteroids has been found to be common, few cases linking this condition with idiopathic intracranial hypertension were reported. Due to the significant prevalence of children on inhaled corticosteroids, it is important for clinicians to be aware of this association.

Case Presentation

We present the case of an 11-year-old with past medical history of asthma who presents with worsening headaches. Ophthalmological evaluation showed disc edema. Brain MRI showed pineal cyst and Chiari type I malformation, which were incidental and non-contributory, lumbar puncture showed elevated opening pressure 55 cm, other CSF studies were normal. Symptoms improved after the procedure. Review of medical records revealed chronic use of inhaled corticosteroids for severe asthma. Two months prior to admission, patient was started on tiotropium bromide inhaler to discontinue his inhaled corticosteroids given growth concerns. Adrenal insufficiency was suspected as a cause of this patient's symptoms. Patient's cortisol and ACTH stimulation test were confirmatory for adrenal insufficiency. Patient was subsequently started on physiologic replacement. Repeat lumbar puncture showed lower opening pressure at 29.8 cm. Follow-up ophthalmological examination was normal.

Discussion

Adrenal insufficiency following withdrawal of inhaled corticosteroids has been found to be common. The association between the discontinuation of corticosteroids and new onset headache suggests adrenal insufficiency as the likely cause of this patient's idiopathic intracranial hypertension. The mechanism is not well-understood. Given the significant number of children on inhaled corticosteroids, it is important for clinicians to be aware of the potential effect of these drugs on adrenal axis and to recognize that idiopathic intracranial hypertension could be a presentation of adrenal insufficiency.

Immunotherapy in a rare case of primary pelvic retroperitoneal melanoma

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Background

Recent advances in novel immunotherapeutic and targeted therapeutic agents have increased treatment options in patients with advanced metastatic melanoma. However, evidence in the literature on whether or not extracutaneous melanoma will acquire an equivalent advantage from these therapies is very scarce. Extracutaneous melanomas are generally rare and aggressive with a higher incidence of metastatic disease and poor prognosis. We present a very rare case of a 54-year-old woman with primary pelvic retroperitoneal melanoma treated with an anti-PD1 antibody, pembrolizumab.

Case Presentation

A 54-year-old Caucasian female presented with postmenopausal vaginal bleeding and left lower quadrant pain. Gynecological examination and endometrial biopsy were unremarkable. Transvaginal ultrasound revealed a 4.3 x 3.4 x 3.0 cm left adnexal lesion. The patient referred to gynecology oncology for further assessment and discussion of treatment options. The patient agreed to undergo a robotic assisted total laparoscopic hysterectomy with bilateral salpingo-oophorectomy. While performing the TLH-BSO, a black, solid, right-sided retroperitoneal mass was identified. The right retroperitoneal pelvic mass was sent for pathological investigation and was consistent with malignant melanoma.

Discussion

Extracutaneous melanoma comprises only 5% of all melanomas. Primary pelvic retroperitoneal melanoma has an even lower incidence. Owing to its rarity, there is no substantial evidence base for treatment of extracutaneous melanoma. Treatments are often based on knowledge derived from treatment of cutaneous melanoma. Pembrolizumab and nivolumab are PD-1 inhibitors recently approved by the Food and Drug Administration (FDA) to treat advanced melanoma. They demonstrate greater progression-free survival rates, overall survival rates and toxicity profile compared with ipilimumab. The combination of nivolumab with ipilimumab results in greater progression-free survival compared with ipilimumab alone. Multimodality imaging is essential in assessing the extent of extracutaneous melanoma disease. However, even comprehensive imaging may not reveal the true extent of disease spread and this may only become apparent following surgical exploration.

Late Onset Mania Associated with Removal of Oligodendroglioma

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Background

A 62-year-old male presented with recurring manic episodes following the removal of an oligodendroglioma.

Case Presentation

A 62-year-old male was admitted with new onset confusion with mild disorientation. He had no prior history of mood disorder. During hospitalization the patient had a seizure and brain MRI reviewed a mass. The patient underwent right anterior temporal lobe resection for an oligodendroglioma.

Following surgery, Folstein Mini Mental status exam was 28/30. The patient had no focal neurologic deficits. Despite good neurologic outcome, the patient developed significant change in his mood and behaviors. Five years after surgery he was involuntarily admitted for manic symptoms, after leaving home unexpectedly and driving "about 3000 miles" in five different states.

Valproic acid, Quetiapine and Alprazolam were used to improve sleep and paranoid thoughts.

During the following two years, the patient continued to display a cheerful affect with increased sense of self-worth with grandiose thoughts, but required further hospitalization.

Discussion

Primary bipolar disorder may manifest in those above the age of 50, but the mean age of onset for bipolar disease is 17-31 years of age, with only 10% of primary bipolar disease first presenting after age 50. In fact, mania secondary to organic disease is seen in up to 43% of manic cases in the elderly. For this reason, new onset mania in elderly patients should lead physicians to meticulously rule out secondary causes.

The mechanism by which mania develops in the presence of a focal cortical lesion is unknown and likely multifactorial. Perfusion studies suggest that secondary mania can be caused by "contralateral release phenomenon" with increased activation of the left hemisphere.

The case presented in the report exemplifies the "contralateral release phenomenon" as an etiology for secondary mania, following right anterior temporal lobe resection.

Neurobehavioral Disorder Associated with Prenatal Alcohol Exposure (ND-PAE): Case Series Report From a University-Based Psychiatric Clinic

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Background

Approximately 25% of children affected by in utero alcohol exposure exhibit the physical characteristics typical of Fetal Alcohol Syndrome. However prenatal exposure to alcohol is known to be associated with a spectrum of disabilities ranging from mild to severe, even in the absence of typical physical characteristics. Neurobehavioral Disorder associated with Prenatal Alcohol Exposure is a proposed diagnosis in the latest edition of DSM-5. Diagnostic criteria include impairments in neurocognition, self regulation, and adaptive functioning. It is aimed to capture children with confirmed prenatal alcohol exposure that fall short of the FAS criteria, yet are struggling in a variety of areas.

Hypothesis

Fetal alcohol spectrum disorders (FASD) are more difficult to identify as patients may lack growth retardation and facial features typically seen in fetal alcohol syndrome. Further, a confirmed history of prenatal alcohol exposure is often difficult to obtain.

Methods

Patients with prenatal alcohol exposure were selected from a university based psychiatric clinic for this case series. The Diagnostic Guide for FASD published by Washington University FASDPN was used to generate a four digit diagnostic code for each patient and correlate the findings with the proposed ND-PAE diagnostic criteria. The series presents patients that do not have facial features characteristic of Fetal Alcohol Syndrome but do have significant impairment from neurobehavioral symptoms.

Conclusion

Children with disorders in this spectrum need ongoing support, often into adulthood, and at times multiple medications to help control their behaviors. They often have learning disabilities, which if identified early may respond to appropriate academic interventions. Other services such as speech therapy, physical therapy, or long-term foster care may be warranted in some cases.

Typically, these children need specialized behavioral interventions and more complicated medication regimens than for ADHD alone. For this reason, it is critical for physicians to consider this diagnosis while formulating a case as this will ensure children can receive the ancillary services they need. Recognition of this condition in the DSM-5 would raise awareness among healthcare professionals across all disciplines.

Case Presentation

In this case series, we describe patients with confirmed prenatal alcohol exposure presenting to the psychiatry clinic. The Diagnostic Guide for FASD published by Washington University FASDPN was used to generate a four digit diagnostic code for each patient and correlate the findings with the proposed ND-PAE diagnostic criteria. The series presents patients that do not have facial features characteristic of Fetal Alcohol Syndrome but do have significant impairment from neurobehavioral symptoms. They display a variety of impairments in intelligence, learning, memory problems, mood regulation, impulsivity, attention problems, executive functioning, communication difficulties, motor skills and daily living skills.

Discussion

Children with disorders in this spectrum need ongoing support, often into adulthood, and at times polypharmacy to help control their behaviors. Their troubles often go unidentified and unaddressed mainly due to lack of recognition of the underlying cause of these difficulties. Early interventions in school settings can help mitigate some of these disabilities. Public health efforts in improving an understanding of alcohol effects on fetus as well as training in physicians in recognizing and addressing these difficulties is imperative, given the costs to the society. Recognition of this condition in the DSM-5 would raise awareness among healthcare professionals, regardless of discipline.

Penile Mayhem From Zippers: A Hundred Year Anniversary

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Background

2017 marks the hundredth anniversary of the zipper, originally patented by Swedish immigrant Gideon Sundback (1880-1954) as the "separable fastener." Initially relegated to footwear, the zipper became fashionable on clothing in the 1930s, and soon found a home on pants, where it won "The Battle of the Fly" over buttons. However, reports of penile trauma from zippers promptly followed. By 2013, the U.S. Consumer Product Safety Commission estimated that over 2,000 males suffer a ZIRPI (zipper-related penile injury) every year in the U.S. alone. Zippers are the most common cause of penile trauma in men, and a close second to toilet seats in boys. Risk factors for ZIRPI include being uncircumcised or insufficiently circumcised. Surprisingly, dressing "commando," or sans underwear, is not a clear risk factor for ZIRPI, as studies are conflicting.

Hypothesis

Why has this penile mayhem been allowed to continue? Most experts in the legal and medical communities alike consider ZIRPI litigation to be frivolous; product recalls or lawsuits involving zippers generally relate to unfortunate instances of asphyxiation occurring in zippered outerwear or bean bag chairs.

Methods

ZIRPI case reports suggest that the zipper is tolerated precisely because of its major operational risk; that is, it is the quickest way to expose the penis. Initially marketed as a method of encouraging children to dress themselves, it may actually be more of a hazard for the inexperienced uncircumcised user.

Results

The invention of Velcro in the 1950s did little to displace the zipper from its preeminent position on menswear. A zipper stuck on the foreskin may be managed with an emergency circumcision; however, it is sometimes possible to free the zipper by generous application of mineral oil to the area, or by "popping" the faceplates of the slider with a small flat screwdriver.

Conclusion

The zipper is here to stay, by popular demand.

Pericardial Cyst

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Background

Pericardial cysts are considered to be a rare congenital abnormality with an estimated incidence of 1:100,000. We are reporting a case of a 58-year-old female with chest pain and non-productive cough, who was initially diagnosed with pericarditis and found to have a pericardial cyst.

Case Presentation

A 58-year-old non-smoking female presented to the clinic with new onset very severe, non-exertional, retrosternal, stabbing pain, radiating to the back. It was associated with dry cough and intermittent lightheadedness. She denied any palpitation, shortness of breath, diaphoresis, recent sick contacts or viral illness.

Her past medical and surgical history were not significant, and family history was negative for cardiac disease. Her vital signs were within normal limits. On exam, she was alert and oriented, no JVD or lower limb edema. Heart sounds were normal with regular rate, no murmur, but a mid-sternal pericardial friction rub was heard with the patient in the supine position. Lungs were clear bilaterally with no chest wall tenderness. EKG revealed normal sinus rhythm with a depressed PR in lead II and aVF. Troponins were negative, d-dimer was 613 and CRP 7.68. The CXR was normal. CT chest with IV contrast showed a 7.0 cm right pericardiophrenic cyst and no evidence of a pulmonary embolus. Echocardiography revealed normal LV function and mild tricuspid regurgitation without evidence of pericardial effusion. The patient was evaluated by a thoracic surgeon and recommended to follow up as outpatient. Patient's pain dramatically improved on Ibuprofen.

Discussion

Pericardial cysts are rare benign congenital abnormalities that can be asymptomatic or present with dyspnea, chest pain, pericarditis, and hemorrhage into cyst, pericardial tamponade, atrial fibrillation, or a dry cough. Physicians should be aware that these cysts, although probably present since birth, can be a cause of non-ischemic chest pain so that appropriate treatment is initiated.

Placental Abruption Leading to DIC in a Preterm Patient

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Background

Substance abuse is a growing problem in the United States. According to Williams Obstetrics, up to 10% of pregnancies are complicated by the use of illicit substances. Cocaine, in particular, is known to have several adverse outcomes associated with its use. These include fetal growth restriction, preterm delivery, placental abruption, maternal cerebrovascular hemorrhage, and maternal myocardial damage.

Case Presentation

A 35 year old G12 P3447 at 30.5 weeks gestation presented to the obstetrics triage unit with severe abdominal pain and vaginal bleeding following recent cocaine use. The diagnosis of placental abruption was made and the patient was taken to the operating room for an emergent repeat cesarean section. Following the procedure, it was noted that the patient continued to have vaginal bleeding. Despite hemabate, cytotec, and Bakri balloon placement, bleeding continued. A supracervical hysterectomy with bilateral salpingectomy was preformed. During that time, patient was found to be in disseminated intravascular coagulation (DIC). The mass transfusion protocol was initiated. These measures also failed to control bleeding. The patient was again taken to the OR where a cerclage and vaginal packing were placed. Interventional radiology was consulted; bilateral uterine artery ligation was preformed. The patient was then transferred to the ICU.

Discussion

Our patient was found to have placental abruption and DIC in the setting of recent cocaine use.

Potential consequences of long-term selective eating in autism spectrum disorder

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Background

We present a case demonstrating the importance of addressing dietary selectivity in children diagnosed with autism spectrum disorder (ASD). This highlights the importance of primary care physicians in evaluating dietary quality as opposed to concentrating solely on quantity and body mass index indices.

Case Presentation

A 17-year-old male with a history significant for ASD and a long-standing selective diet presented with right hip pain. The patient acknowledged a fall one week prior to admission. He felt some pain but resumed day-to-day activities. Seven days later, he complained of dizziness, had a possible syncopal event, and fell in the shower. He complained of worsening pain and was taken to the emergency department.

Physical exam showed bilateral lower extremity tenderness (L > R). The patient had a body mass index of 20.94 (normal). Imaging revealed bilateral hip fractures; a new fracture on the left, and a chronic one on the right. Lab values revealed the following: potassium 3.3 [3.5-5.0], calcium 5.2 [8.5-10.1], ionized calcium 0.66 [1.12-1.38], magnesium 1.4 [1.8-2.4], alkaline phosphatase 532 [45-117], total bilirubin 2.7 [0.2-1.0], parathyroid hormone 329.1 [8.0-97.0], and vitamin D < 4.2 [deficiency < 15].

His hospital course included open reduction internal fixation surgery of the left femoral neck fracture. His stay was complicated by rhabdomyolysis and fat emboli requiring intubation. He was discharged on hospital day 20.

Discussion

Primary care physicians play an important role in managing patients with ASD and their associated medical conditions, coexisting behavioral problems, and decreased activities of daily living. Dietary selectivity in this patient with a normal body mass index resulted in nutritional imbalances including a hypocalcemia and a negligible vitamin D level leading to brittle bones. Even in children with normal growth patterns, there may be significant nutritional deficiencies; therefore, a nutritional screen is warranted when dietary selectivity is identified.

Progression of Staphylococcal Scalded Skin Syndrome in Pediatric Patient

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Background

Staphylococcal Scalded Skin Syndrome (SSSS) is the most severe exotoxin mediated skin presentation caused by *Staphylococcus aureus* mainly seen in patients under five years. This case visually shows and describes the illness progression, as well as discusses important points to consider when treating a patient with SSSS.

Case Presentation

Two year old healthy female presented with a rash that began five days prior as small red bump on her chin. Per mom's history, on day two of illness her cheeks turned red. Periorbital swelling was noted on day three extending to her entire face on day four. She became irritable, had decreased oral intake and did not want to be held. She was being followed as an outpatient, but day five she spiked a fever and due to dissemination and blistering of rash, she was admitted to hospital. Her skin was erythematous, edematous covered with maculopapular rash from head to knees, skin sloughing on neck and axillae, honey crusted lesions periorally. Labs and cultures were completed. IV clindamycin, acyclovir and fluids were started. Vancomycin added on hospital day two. Wound care and pain control initiated. Patient showed significant clinical improvement and discharged home on hospital day four with six days of clindamycin.

Discussion

Important considerations should be addressed when managing a patient with SSSS. Treatment includes clindamycin because it remarkably suppresses toxin production. Vancomycin should be added initially in areas where community-associated MRSA infections are common. In addition to antibiotics, treatment of fluid loss, wound care and pain relief are essential. NSAIDs should not be used due to possible decreased renal clearance of the toxin. Healing occurs without scarring as the toxin mediates cleavage of stratum granulosum layer of the epidermis. Early recognition and treatment provides patient with relief and significant improvement as seen in the provided pictures of this case presentation.

Pseudotumor Cerebri Presenting as Possible Prior Hemorrhage on MRI

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Background

Pseudotumor cerebri is characterized by symptoms of headache, papilledema and vision loss, due to increased intracranial pressure. While seen infrequently, it typically presents in overweight females of childbearing age and can manifest during pregnancy. Pseudotumor cerebri must be distinguished from secondary intracranial hypertension due to the risk of severe vision loss.

Case Presentation

A 20 year-old woman G2P1001 at 19 weeks gestation presented to her obstetrician for headaches and blurry vision. The patient reported being given a muscle relaxer in attempt to relieve headache symptoms. At 20 weeks gestation she presented to the Emergency Department with complaints of complete loss of vision in the left eye. Further questioning yielded blurry and loss of peripheral vision in right eye, vertigo, and tinnitus in the right ear. On exam, right pupil was round and reactive. The left pupil was dilated and nonreactive. Initial MRI showed concern for possible prior hemorrhage related to venous anomalies. MRA/MRV reported no evidence of arterial or venous abnormalities. Diagnosis of PCT was made upon ophthalmology exam, which revealed bilateral papilledema. Emergent lumbar puncture was recommended along with acetazolamide therapy. LP performed with opening pressure of 53 cm H₂O. Throughout hospital course, patient reported continual improvement in headache, color vision, blurry vision and visual field deficits in both eyes. Coagulation studies performed by neurology revealed diagnosis of Factor V Leiden and Protein S deficiency. LMWH 40 mg BID was initiated at a follow-up appointment. Patient was seen a month after discharge with only minor peripheral vision loss in the left.

Discussion

As illustrated, pseudotumor cerebri has the potential for severe vision loss due to increased intracranial pressure. Although complete vision loss is rare, it is a serious complication of pseudotumor cerebri. Recognition of this syndrome is essential for the initiation of appropriate therapy and prevention of severe vision loss.

Purple Urine Bag Syndrome: A Colorful Condition in the Chronically Catheterized
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Background

Purple Urine Bag Syndrome (PUBS) is a rare condition characterized by purple discoloration of the urinary drainage bag. It is typically seen in elderly patients with chronic indwelling urinary catheterization, and is associated with urinary tract infections (UTI) with high bacterial load, female gender, severe disability, constipation, and alkaline urine.

Case Presentation

A 78-year-old male with chronic urinary retention requiring intermittent Foley catheterization for the last three months was brought to the Emergency Department (ED) for altered mental status and purple urinary bag discoloration. His urinary catheter was last changed three weeks prior to this admission. Urinalysis was suggestive of UTI, and Vancomycin, Aztreonam, and Levaquin were started due to the impression of sepsis. The purple urine disappeared after the urinary catheter and drainage bag were changed. After the patient developed a fever, Meropenem replaced Aztreonam to cover extended-spectrum beta-lactamase (ESBL)-producing organisms. Subsequently, the urine culture grew *E. coli* and *K. pneumoniae*, and antibiotic susceptibility results revealed sensitivity to Levaquin, resulting in discontinuation of Vancomycin and Meropenem. Finally, the patient's symptoms resolved and he was discharged on Levaquin.

Discussion

PUBS is a rare phenomenon in which the urinary drainage bag turns purple in patients with chronic indwelling urinary catheterization. This phenomenon occurs due to tryptophan metabolites in the urine being broken down by bacteria containing indoxyl sulphatase and phosphatase enzymes. Indigo and indirubin are produced, which combine to appear purple. It is commonly associated with *E. coli*, *K. pneumoniae*, and *Enterococcus* spp. Most patients are asymptomatic and only require changing of the urinary catheter and drainage bag, while some patients may have symptoms of a UTI and require the appropriate antibiotics. Education about this condition is especially important in rural areas, where physicians may be less familiar with it, since its presentation is alarming and may result in an unnecessary workup and/or treatment.



Rare But Real: Recognizing Epidermolysis Bullosa Acquista

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Background

Epidermolysis Bullosa Acquista (EBA) is a rare disease that causes widespread blistering of the skin and mucosa. EBA is caused by IgG autoantibodies to type VII collagen, which leads to fragility of the dermal-epidermal junction with blistering in trauma-prone areas of the skin. It is most commonly seen in the elderly, however we present a case in a 59 year old woman.

Case Presentation

A 59 year old Caucasian female presented to clinic after she noticed itchy and painful blisters appearing on her hands, arms, feet, and legs over a period of 4 to 5 days. The patient scraped her leg on a cardboard box 1 week prior to onset of the blisters. The patient initially attributed the lesions to starting cyclobenzaprine, but her pharmacist was not aware of such a drug reaction. The patient presented to walk-in clinic where she was told she had a bullous disease and needed further work-up.

The patient was referred to dermatology who ordered a punch biopsy. Serum laboratories for indirect immunofluorescence for IgG and IgG4 antibodies were equivocal. The patient was started on Dapsone 100 mg BID.

Based on the patient's clinical presentation, laboratory findings, and biopsy, she was diagnosed with EBA, a chronic disease that often leads to substantial morbidity, especially if the mucous membranes are affected. Fortunately, this patient responded well to treatment, and after 1 year she was able to stop medication. This is uncommon as patients typically take life-long medication to suppress the disease.

Discussion

This case raises awareness for a rare condition so providers can recognize and rapidly refer patients for biopsy and treatment. While EBA is not an acutely life-threatening disease, it can cause significant morbidity, including pain, scarring, infection, decreased activity, and psychological issues which can be lessened by early diagnosis and treatment.

Rare manifestation of Systematic CMV infection

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Background

Cytomegalovirus (CMV) is a major pathogen for immunocompromised patients, hematopoietic cell transplant recipients and patients treated with immunomodulating drugs. The range of clinical disease due to CMV in immunocompromised patients is broad and includes febrile syndromes, hepatitis, pneumonitis, retinitis, encephalitis, esophagitis, and colitis. Here we present a very rare manifestation of Systematic CMV infection.

Case Presentation

A 52-year-old Gentleman was a history of Ankylosing Spondylitis being treated on Entcept (Anti-TNF modulator) was admitted IM floor for work up of pancytopenia. Eye Exam showed Bilateral cotton wool lesions without frank retinitis (Fig-2). Lab work up was pertinent for Transaminitis and CMV PCR of 13800 copies in Blood. Entcept was stopped. Bone marrow showed none specific bone marrow activation due to viral infection (Fig-2).

The Diagnosis of systematic CMV infection was made and the patient was scheduled for IV Ganciclovir as outpatient. 1 week after discharge the patient presents back to the hospital with Non-palpable, non-pruritic, non-blanchable petechial rash. The rash started bilaterally around mid shin but then spread upward and downward and circumferentially (Fig-3,4,5). This was associated with enlargement of middle cervical lymphadenopathy. The concern for CMV vasculitis vs CMV induced vasculitis was raised. Inflammatory markers including ESR and CRP were trending up. A 3mm punch biopsies were taken. Histopathological examination and CMV PCR were done on the samples. The patient was started on Ganciclovir. Results of Pathology showed Leucocytoclastic Vasculitis with early epidermal spongiosis and perivascular nuclear dust (Fig-6). This rash has markedly improved over the course treatment

Discussion

Systematic CMV infection has a very wide range of presentation. CMV induced vasculitis is a very aggressive manifestation of this infection. Complications of this manifestation includes wide spread skin necrosis, Deep vein thrombosis and Mesenteric artery occlusion. Early recognition is vital and early institution of IV treatment is key in preventing such fatal complication.

Ruptured Splenic Artery Aneurism In Pregnancy With Fetal Demise; A Case Report

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Background

Although an uncommon pathology, splenic artery aneurism rupture in pregnancy has a high mortality rate for both mother and fetus.

Case Presentation

We present a case of ruptured splenic artery aneurism in pregnancy at 36 weeks gestation, diagnosed at time of cesarean delivery. The patient presented after waking with new onset acute abdominal pain, lethargy, and decreased fetal movement. Upon arrival, she was hemodynamically unstable, with hypothermia, severe hypotension, tachycardia, and elevated WBC count to 28,000. Fetal demise in utero was diagnosed immediately upon arrival by bedside ultrasound. Urgent cesarean section was performed for working diagnosis of septic shock secondary to chorioamnionitis with fetal demise. Cesarean was converted to midline laparotomy due to hemoperitoneum, which revealed ruptured splenic artery aneurism. Subsequent splenectomy was performed and patient was stabilized in the ICU. The patient was discharged on postoperative day nine in stable condition.

Discussion

Splenic artery aneurism rupture during pregnancy is a rare event that requires prompt management to prevent maternal and fetal mortality.

Tall peaked T waves in the 12-lead surface electrocardiogram in a case of severe hyperphosphatemia

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Background

Tall peaked T waves in the surface ECG are usually ascribed to a few conditions (e.g. hyperkalemia, acute ischemia, normal variant). Even though these are usually the most frequent causes, other less common situations can give rise to such ECG changes. Amongst these, hyperphosphatemia has been rarely reported in the literature.

Case Presentation

A 51 year-old man was brought into our emergency department by ambulance in a stupor after having been found down and in respiratory distress in his home by the rescue squad. The emergency system was activated by his neighbor after not being able to contact our patient for a couple. After contacting his closest relatives, no significant past medical history, allergies, or toxic habits were elicited. Upon initial assessment, he was noted to have laboratory evidence of severe diabetic ketoacidosis (glucose 1037 mg/dl, Anion gap 39, B-hydroxybutyrate > 4.0 mmol/L) associated with lactic acidosis (lactate 3.20 mmol/L), kidney injury (BUN 86 mg/dl, creatinine 3.6 mg/dl) and severe hyperphosphatemia (14.9 mg/dl). His surface 12-lead ECG at the moment displayed tall peaked T waves in precordial leads despite a normal potassium level of 4.6 mEq/L (Figure 1). Of note, his calcium and troponin I levels were also normal (9.5 mg/dl and < 0.012 ng/ml respectively). After progressive correction of electrolytes abnormalities, including phosphate levels (5.7 mg/dl), the T wave abnormalities were also noted to be regressing as well (Figure 2).

Discussion

Final Diagnosis

Severe hyperphosphatemia secondary to acute renal failure associated with diabetic ketoacidosis.

Outcome

He was ultimately discharged and fully recovered after 2 hemodialysis sessions along with few days of intensive management of his diabetic ketoacidosis.

Tetanus Case Presentation

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Background

There were 233 cases of tetanus were reported between 2001 and 2008 in the USA, with a fatality rate of 13.2%. Tetanus causes severe muscle contractions, and diagnosis is mostly clinical. The case described is about a 6-year-old unimmunized patient who presented with tetanus. Vaccinations have greatly decreased the incidence of tetanus, although 84.2% of 19-35 month old are not vaccinated against it. With the severe consequences of a missed diagnosis, it is vital that clinicians are aware of the diagnosis and treatment.

Case Presentation

We present the case of a previously, unimmunized 6-year-old boy with complaints of a stiff upper back and difficulty ambulating for one day. He had begun having neck pain and stiffness the night prior. He also described dysphagia and lockjaw. He had a recent history of tick bites and had a thorn removed from his knee earlier that day. On examination he was unable to open his mouth and was given a benzodiazepine as a muscle relaxant and as an anxiolytic. During the night he remained hemodynamically stable, with increasing concerns about his upper airway patency. He was promptly given the D-Tap vaccine and tetanus immune globulin. The decision was made to transfer to a higher level of care with pediatric infectious disease coverage. Prior to transport he was not in distress and had no airway compromise.

Discussion

Tetanus is a serious disease with progressive symptoms. While immunizations have decreased the number of cases, unimmunized children are still at risk. Due the severity of this disease, it is important that clinicians keep a high level of suspicion and become more familiar with treating tetanus as a disease and it's complications.

The complicated conversion: Diagnosis and management of prolonged conversion disorder with multiple deficits

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Background

Conversion disorder is a psychiatric disorder with an array of physical and sensory deficits with no physiologic basis. Some deficits can persist for years after original diagnosis. This case showcases the complexity in diagnosis of conversion disorder and the therapeutic challenges it presents.

Case Presentation

A 40 y/o male first presented to our psychiatric hospital in January 2013. After an assault which resulted in a traumatic head injury the patient had been refusing to eat or speak and was unresponsive to auditory stimuli. He also had significant ataxia and was unable to walk or stand unassisted. Head CT was performed which showed no intracranial abnormality. While hospitalized patient's speech and hearing deficits persisted. However he had improvements in his ability to take care of ADLs and began eating so he was discharged after a two week hospitalization. However, he once again entered a catatonic state and was re-admitted in February 2013. He has been under psychiatric care since this time. Numerous exams and procedures were performed to determine the etiology of his symptoms including MRIs, EEG, neuro-psychological testing and audiometry with ABR. Diagnostic studies could not be correlated to any specific neurological disorder so diagnosis of conversion motor paralysis, deafness and aphonia were made. This patient participated in weekly physical therapy sessions and can now walk without assistance of a walker. The patient has learned American Sign Language to communicate but has started speaking after several speech therapy sessions and can hear with the aid of hearing amplification devices.

Discussion

This case highlights complexities in diagnosis and treatment of conversion disorder. The varied and at times unrelenting symptoms complicate the diagnostic picture and make conversion disorder difficult to treat. Reinforcement that deficits are reversible and active participation in continuous therapy can make improvements in symptoms.

The Development of an Ovarian Granulosa Cell Tumor, Adrenocortical Carcinoma, and a Sigmoid Adenocarcinoma in a Patient with a BRCA1 Mutation: a case report

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Background

Patients possessing mutated BRCA1 alleles are at a higher risk for the developing breast and ovarian cancer. Studies suggest that having a mutated BRCA1 allele does not pose significant risk for other types of cancers. We present a patient with a BRCA1 mutation who developed three independent neoplasms not typically associated with her genetic predisposition.

Case Presentation

A 48 year-old G3P3 female presented to the ED complaining of abdominal pain and distension, nausea, and increased frequency of urination. Initial CT of the abdomen revealed a complex cystic and solid mass within the pelvis measuring 15.8x12.9x18.0 cm, suspicious for ovarian cancer. Additionally, a 13.2 cm mass was noted in the right upper quadrant, suspicious for an adrenal mass.. The patient subsequently underwent exploratory laparotomy for further evaluation and resection of the abdominal masses. During the operation, an incidental sigmoidal mass was discovered and all resected masses were sent for further pathological analysis.

Sigmoid histopathology showed lymph node positive moderately differentiated adenocarcinoma. Histopathology of the ovarian mass revealed Stage IA granulosa cell tumor. The adrenal mass histopathology revealed a Stage T2 17.5x12.4x9 cm borderline oncocytic adrenocortical neoplasm of uncertain malignant potential.

Subsequent genetic testing revealed our patient to be heterozygous for the c.5207T>C (p.Val1736Ala) BRCA1 mutation. The patient received standard chemotherapy and had an unremarkable recovery.

Discussion

To our knowledge, this is the first report of a patient developing three independent neoplasms not typically associated with a BRCA1 mutation. Our experience supports previous reports that BRCA mutations may be associated with an increased risk for multiple primary neoplasms. Further investigative efforts should be directed towards elucidating if BRCA1 mutations pose a risk for the development of neoplasms other than known breast and ovarian cancers.

Thiamine Deficiency Related Peripheral Neuropathy Diagnosed by MRI Brain: A Case Report

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Background

Peripheral neuropathy is one of the more common reasons for referral to neurologists in the United States, with the most likely etiologies being a complication of diabetes or alcohol abuse. Other common etiologies include thyroid disease, vitamin B6 and B12 deficiencies and monoclonal gammopathies. Other less common causes that affect certain patient populations include vitamin B1 deficiency, heavy metal toxicities, HIV and rheumatologic disorders.

Case Presentation

We present a case of a peripheral neuropathy secondary to thiamine deficiency in a 40 year old female with past medical history significant for previous roux-en-y gastric bypass seven years prior, Crohn's Disease, chronic anemia, congenital absence of the right kidney and depression. She had a preceding gastroenteritis in the weeks preceding her arrival to the ER and given the rapid worsening of her neuropathic complaints Guillain Barre Syndrome was considered but some of her neurologic deficits were not typical for peripheral nervous system dysfunction so she underwent an MRI brain with and without contrast which showed the typical T2 Flair signal changes of the mammillary bodies indicative of thiamine deficiency and she was started on thiamine supplementation. Days later her thiamine drawn the day of admission returned low at 40nmol/L confirming the diagnosis of peripheral neuropathy secondary to thiamine deficiency. She underwent a thorough peripheral neuropathy workup including a lumbar puncture without any other explanation for her symptoms.

Discussion

Had we waited for the thiamine level to result prior to starting thiamine we may have missed an opportunity to halt the progression and subsequently reverse her symptoms of her neuropathy and her MRI findings the day after admission assisted in the earlier diagnosis and subsequent more prompt appropriate supplementation.

Unusual Utilization of Peripheral Arterial Stents!

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Background

Coronary artery aneurysms (CAAs) is defined as coronary dilatation which exceeds the diameter of normal adjacent segments or the diameter of the patient's largest coronary vessel by 1.5 times. The incidence varies from 1.5% to 5% with male dominance and a predilection for the right coronary artery. Atherosclerosis accounts for 50% of coronary aneurysms in adults.

Case Presentation

A 67 year old male with a past medical history of Chronic Obstructive Pulmonary Disease (COPD) was presented in March, 2013 with an acute anterior wall Myocardial Infarction (MI). Coronary angiogram revealed severe ectatic coronary arteries with 100% occluded proximal Left anterior descending artery (LAD) with TIMI 0 flow (Fig.1). A large thrombus burden noted (Fig.2). Under Intravascular Ultrasound (IVUS) guidance, a Protege Ever flex 8/20 mm self-expandable peripheral stent was deployed in the proximal LAD. This is along with 3.0/12 mm Resolute Integrity stent to mid LAD, which resulted in TIMI 3 flow with resolution of most of the angiographic thrombus (Fig.3). Patient required placement of Express LD 7/17 mm balloon-expandable stent 24 hours later due to acute stent thrombosis. Three years later, the patient was presented with an acute inferior wall MI. Coronary angiogram revealed patency of the previously placed LAD peripheral stents (Fig. 4,5) with 100% occlusion of the mid RCA

Discussion

Consensus in the management of CAA is not well established yet. Treatment options consist of surgical, percutaneous, and medical approaches. Surgery is usually recommended for CAA that exceeds three to four times the original vessel diameter. Coronary artery Polytetrafluoroethylene-covered stents has been successfully utilized in CAAs. This is a challenging case in which peripheral arterial stents played a unique role. To our knowledge, this is the first case in literature describing the possible utilization of peripheral arterial stents in CAAs. Interestingly, excellent results were observed over three years.

Visual Hallucinations and "Capgras" Delusions Regarding Personal Belongings Associated with Occipital Lobe Seizures

Erika Maynard, Brandon Lilly, Kelly Melvin, Suzanne Holroyd

Department of Psychiatry & Behavioral Medicine, Marshall University Joan C. Edwards School of Medicine

Background

Visual hallucinations (VH) may be either simple or complex and have been associated with occipital lobe seizures. While rare, postictal psychotic symptoms most often manifest as thought blocking, hallucinations, illusions, delusions, and acute confusion. Separately, Capgras syndrome is a delusional belief that a familiar person has been replaced by an imposter; such delusions are exceedingly rare in cases of epilepsy but thought to result from postictal disinhibition of the dominant hemisphere involved in recognition or from dysfunction of the nondominant hemisphere involved in perceptual integration. We present a case of both simple and complex VH as well as Capgras syndrome regarding a person's belongings, associated with occipital lobe seizures.

Case Presentation

A 59-year-old male was admitted for hypertensive emergency with visual disturbances. MRI brain showed old left thalamic infarct and CTA Head/Neck showed a stable 6.3mm left-sided carotid aneurysm. Hypertensive emergency was treated but he then developed left lateral gaze deviation with nystagmus and VH described as red and green "pinwheels" moving diagonally downward to the left before falling off the visual field. VH then evolved into that of people and dogs. Head CT was negative and EEG revealed occipital lobe seizures. Valproic acid and levetiracetam were started before going into status epilepticus refractory to lorazepam, requiring intubation and midazolam. After several days, he was extubated and repeat MRI brain demonstrated chronic small vessel ischemic changes. When presented with his personal belongings, he did not recognize any of them as belonging to him; he adamantly stated he had never seen them before. For days, he continued to be unable to recognize his belongings as his own, but after much convincing, the patient reluctantly began to accept his personal belongings, but never a sense of them being his own.

Discussion

Implications and additional details of the case will be discussed.





CLINICAL SCIENCE POSTER SESSION III • 2:30 PM – 3:15 PM

29TH ANNUAL RESEARCH DAY POSTER SESSION

A Chart Review of Acute Care Inter-Hospital Transfers from Rural WV Hospitals

Vaughan, F., Bennett, K., Nair, D.

JCESOM Department of Family and Community Health

Background

According to the Healthcare Cost and Utilization Project, approximately 1.5% of patients presenting to Emergency Departments in the United States in 2009 were transferred to another hospital for short term acute care.¹ The authors cited a corresponding figure for hospitals in rural United States that was twice as high. That rural acute care inter-hospital transfers warrant particular study was highlighted in the findings of a 2006 national panel of academic emergency medicine physicians.² The panel earmarked rural emergency care as an area of improvement, calling for more research in rural settings in partnership with academic medical centers regarding the transfer of patients from local hospitals lacking needed specialty resources.

Hypothesis

Our aim was to document the characteristics of acute care patient transfers from these hospitals and how the transferees differed from patients with similar diagnoses who were not transferred. Our ultimate goal was to guide future research into the factors influencing inter-hospital transfers in rural WV.

Methods

We examined 40 acute care patient transfers from rural West Virginia hospitals for patients' age, gender, race and primary health insurance, the diagnosis and desired specialty service. We compared patients who were not transferred. For each transfer we collected data on the reason for transfer, the availability of beds of the appropriate acuity level as well as the availability of the relevant specialty at the time of transfer.

Results

Transferred patients were more likely than non-transferred patients to be younger, severely ill and diagnosed with acute coronary syndrome. The relevant specialist was available at the transferring hospital in 6 out of 30 transfers. Beds were available in all cases.

Conclusion

This pilot study provides an agenda for future research into the decision to transfer patients for acute care from rural hospitals.

Analyzing the pharmacologic management of patients after osteoporotic hip fractures

J. Klaus; M. Modaressi; R. Aguilar-Campos; A. Sayan; N. BenHamed; F. Shuler

Departments of Orthopaedic Surgery and Endocrinology, Marshall University School of Medicine

Background

According to National Osteoporosis Foundation recommendations, any patient age 50 or older who suffers a low-velocity hip fracture has clinical osteoporosis and should therefore be treated pharmacologically. FDA-approved medications have been shown to reduce the risk of subsequent osteoporotic fractures. Despite current recommendations, pharmacologic treatment of clinical osteoporosis is often overlooked. Our objective is to determine the percentage of patients older than 65 who receive pharmacologic treatment of osteoporosis within six months after a low-velocity hip fracture. Further, we hope to determine possible causes of this disparity and propose solutions to improve management and patient outcomes.

Hypothesis

We hypothesize that a significantly low proportion of patients age 65 or older with clinical osteoporosis receive pharmacologic treatment within 6 months after hip fracture.

Methods

Medical records for patients age 65 or older who sustained hip fracture during June 2013 - March 2015 were reviewed with Allscripts. Patients who received any form of pharmacologic treatment within six months after their fractured were identified. All analyses were performed using SAS version 9.3 (SAS Institute, Cary, North Carolina). All p-values were based on 2-sided tests, and were considered statistically significant when $p < 0.05$.

Results

Among the 193 patients who met the inclusion criteria, 25.91% (n=50) received pharmacologic treatment within six months after fracture versus 74.09% (n=143) who did not receive any type of pharmacologic therapy after the fracture. There was no significant difference in pharmacologic management when the patients were stratified according to BMI, sex, and age group.

Conclusion

Based on our analysis, it is clear that this vulnerable population is being undertreated pharmacologically. This could be due to clinical structure, physician, patient, and insurance factors. We hope to implement a clinical pathway that increases the number of patients with clinical osteoporosis who receive pharmacologic treatment after hip fracture.

Attention Deficit Hyperactivity Disorder (ADHD) in Children and Adolescents who are Homeless: A Nine Year Study

James Lewis, Miles Gray, Courtney Nichols, Jesse Lewis

Department of Pediatrics, Joan C. Edwards School of Medicine at Marshall University

Background

Homeless children and adolescents are a vulnerable subset of children with special health care needs who are at increased risk for both developmental-behavioral disorders and fragmented medical care. The prevalence and long-term outcome of ADHD in this population have not been studied.

Hypothesis

The prevalence and long-term outcome of ADHD in this population have not been studied.

Methods

From July 2007 through November 2011, all homeless children and adolescents who entered the local City Mission met with a care coordinator to document health care needs prior to their initial Continuity Clinic visit. Parents of school-age children were asked if their child had been diagnosed or treated for ADHD. This information along with Parent and Teacher Vanderbilt Assessment Scales (VAS) were provided to the pediatric resident physician. Charts of all patients reported with ADHD were reviewed through November 2016.

Results

Parents identified 37 of 115 school-aged children as previously diagnosed with ADHD (32%). Of the 34 charts available for review the male: female ratio was 4:1, the white: non-white ratio was 6:1 and the mean age was 10.68 + 0.23. Parent VAS were completed in 7 patients (21%) and Teacher VAS in 2 patients (6%). Thirteen patients (38%) had only the initial visit. Only five children (15%) were followed in Continuity Clinic for greater than one year, received stimulant medication and follow-up visits.

Conclusion

The prevalence of ADHD in children and adolescents who are homeless may be 3-4 times greater than the general pediatric population. Current academic primary care management strategies for this treatable condition appear to be inadequate.

Atypical antipsychotic prescribing patterns for pediatric patients enrolled in West Virginia Medicaid

Kelly Melvin, Joseph Hart, Doug Sorvig

Marshall Psychiatry, Marshall Psychiatry, Medicaid

Background

The prescribing of second-generation antipsychotics (SGA) for young people has increased dramatically over the past two decades. Children enrolled in Medicaid programs have been identified as being more likely than those with private insurance to receive an antipsychotic, leading many states to require prior authorization for their use. However, little is known about how these programs affect prescribing patterns for antipsychotics or other psychotropic medications. This study examined a prior authorization program for second-generation antipsychotic utilization for children under 18 in West Virginia Medicaid. Rates of utilization for antipsychotics as well as other psychotropic classes were assessed.

Hypothesis

We predicted the prior authorization program caused a significant drop in the second-generation antipsychotic prescribing rate immediately after the program took effect. Our secondary prediction was that the program did not have a substantial impact on the prescribing rate of any other psychotropic medication.

Methods

West Virginia Medicaid and CHIP administrative claims were examined from September 2014 to July 2016 (N=273,369 prescriptions) using an interrupted time series design. Segmented linear regression was used to model both immediate effects and trends in prescribing rates before and after implementation of the policy.

Results

Following the policy change, the SGA prescribing rate immediately dropped by 17% of prior levels, adjusted for preexisting trends, and further declined in the following months. All SGA drugs showed a significant decrease in prescribing rate except for aripiprazole. Benzodiazepine prescribing increased in the month following the prior authorization but immediately returned to pre-policy rates. Sustained compensatory prescribing was not observed for any psychotropic drug class.

Conclusion

Implementation of a SGA prior authorization program for children under age 18 resulted in a significant decrease in prescribing rate for this class of medication, without sustained compensatory prescribing for other psychotropic classes.

Choline-Binding-Protein-A as a Target for a Universal Streptococcus Pneumoniae Vaccine

Nicole E. Lee, Ronald J. Stanek, Nancy B. Norton, and Maurice A. Mufson
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Medical Center, Huntington, WV

Background

The widespread use of *S. pneumoniae* protein-conjugated vaccine PCV7 in 2000 and PCV13 in 2010 decreased invasive pneumococcal disease (IPD), but resulted in an increase of replacement serotypes.

Hypothesis

We investigated choline-binding protein A (CbpA), a cell wall protein of *S. pneumoniae*, as a potential universal vaccine target.

Methods

We tested 199 isolates recovered from patients with IPD admitted to three affiliated hospitals from 1981 to 2014. Isolates were serotyped by Quellung reaction, and their penicillin susceptibilities were assayed. Extracted genomic DNA was amplified via PCR for detection of the *cbpA* gene region using previously published primers. All products were run on gel electrophoresis and sequenced. EMBL-EBI Clustal Omega and Percent Identity Matrix were used for analysis.

Results

Of 186 isolates, 94% contained the *cbpA* gene by PCR. We selected serotypes of PCV7, as five of these serotypes develop resistance. By crosschecking 53 strains of the seven serotypes in PCV7, we identified 95% or greater homogeneity among six serotypes - 6B, 9V, 14, 18C, 19F and 23F. Serotype 18C exhibited homogeneity with five, 19F with three, and 6B, 9V and 14 each with two serotypes. We sequenced 39 strains of four additional serotypes in PCV13 - 1, 3, 7F and 19A - and identified homogeneity only with serotype 19A and three serotypes in PCV7 - 6B, 18C and 19F. Three resistant serotypes in PCV7 - 9V, 14 and 19F - and one in PCV13 - 19A - exhibited homogeneity with sensitive and intermediate PCV7 serotypes.

Conclusion

The high level of homogeneity of the cell wall protein CbpA among serotypes of PCV7 suggested that CbpA may be a potential component of a universal *S. pneumoniae* vaccine that might reduce the occurrence of replacement serotypes causing new IPD. Future studies are planned to determine whether CbpA is immunogenic and induces protective antibody.

Cold Meds Course of Action: Pharmacist Recommendations for a Pediatric Population

Courtney Wellman, Nisa Hatami, Michael Clarke, Laura Hunt, Amanda Stratton, and Joseph Evans

Department of Pediatrics, Marshall University Joan C. Edwards School of Medicine

Background

In January 2016, the Perrigo Company recalled two flavors of their generic cough medicine because of incorrect markings on the included dosing cups. The error had the potential to cause an overdose in children taking the medication. These medicines are marketed and sold in pharmacies for the treatment of children despite warnings against their usage in those under four years of age from the Consumer Healthcare Products Association and the US Food and Drug Administration in 2008.

Hypothesis

If companies are producing cough medication to be sold to children under four years of age, then pharmacists may recommend their use despite the inefficacy and side effects.

Methods

To determine if pharmacists in our area were still recommending these medicines to children less than four years of age, a group of medical students posed as parents with children of nine months and three years of age. They each entered a pharmacy and described symptoms of an upper respiratory tract infection. Then, the pharmacists in twenty-nine different pharmacies in the Huntington, West Virginia area were asked, "What medicine would you recommended for my children?"

Results

Five of twenty-nine pharmacists (17%) recommended an oral medication for the nine-month-old child while nineteen of twenty-nine (66%) recommended one for the three-year-old child.

Conclusion

These recommendations come despite warnings against their use. Efforts to educate our local pharmacist of these warnings may prove beneficial.

Colon Preparation in Children: Clinical Practice VS. Research Protocol

Y. Balfaqih, Y. Elitsur, D. Preston

Peds, MU

Background

Various colon preparation protocols for children utilizing PEG 3550 in different doses and duration were reported. Most of them were studied under controlled research circumstances.

Hypothesis

The efficacy of the same colon cleansing protocol would be similar under strict research conditions versus upon use on routine practice. Previous colon preparation data under research protocol will be the reference for comparison (Elitsur R. World J Gastrointestinal Endoscopy 2013;5:165).

Methods

A retrospective review of 81 colon cleansing cases was done. All procedures were performed under routine practice setting using the protocol published previously. Patients were asked to fill a questionnaire about daily frequency of bowel movements and consistency of every stooling; nausea/vomiting/abdominal pain on both days separately. Colon preparation adequacy was scaled from 1 (Poor) to 5 (Excellent) as described (Elitsur et al. 2013). A scale of >4.0 was considered adequate.

Results

Table 1 summarizes the important data including demographics, bowel movement details and preparation grades. GI bleeding and/or IBD were the most frequent indications for the procedure. No major side effects were found. Intubation of the terminal ileum was achieved in 93% of cases.

	Clinical Practice Group (M \pm SD)	Research Protocol Group (M \pm SD)	P-Value
Sample Size	81	38	N/A
Age (years)	13.9 \pm 4.1	9.9 \pm 4.7	N/A
M/F ratio	1.3 : 1.0	0.8 : 1.0	N/A
# Bowel motions/day	6.5 \pm 4.2	7.9 \pm 4.1	0.546
Stool consistency (grade)	5.1 \pm 1.2	5.5 \pm 0.9	0.384
Colon Preparation (grade)	3.9 \pm 0.8	4.0 \pm 1.0	0.176
Adequate preparation (>4.0)	60 (74%)	28 (73%)	0.999

Conclusion

The 2-day colon preparation protocol was as effective under routine practice as under research conditions. Clinicians should confirm and validate the practicality of their published research protocols in real life settings.

De-prescribing Proton Pump Inhibitors (PPI's).

Tyler Farley, Maggie Blackwood, Lynne Goebel.

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Background

Although PPIs are generally well tolerated, long-term studies have raised concerns that chronic treatment with PPIs can increase the risk of some infectious, metabolic and nutritional disorders, including dementia. Presently, no specific method for discontinuation of PPI treatment has proven effective, so this study aims to review a two-week method of tapering PPIs used by two physicians.

Hypothesis

We hypothesize that a two-week method of tapering a PPI while prescribing an H2 blocker will provide a successful and effective method to de-prescribe PPIs.

Methods

A retrospective chart review was conducted over a 5-month period of 2 physicians in an outpatient general internal medicine practice. Ranitidine 150mg, (twice or once daily based on eGFR) was taken while the patient's PPI dosage was tapered every other day for 2 weeks. For patients on PPI's twice a day, the dosage was first decreased to once daily for two weeks before going to alternate day therapy.

Results

Charts of 29 patients, with an average age of 72.2 years and 17% being male, were reviewed with the result of an 86% success rate using the two week tapering method. Of the unsuccessful 14% of patients, 100% that failed at tapering had the diagnosis of GERD and the primary reason for failure was due to symptoms not being well controlled.

Conclusion

This study shows that tapering a PPI to every other day for two weeks with H2 blocker overlap is effective. Randomized controlled trials are needed of different methods of tapering to establish the best control method.

Dietary Walnut to Reduce Risk Factors for Human Breast Cancer Recurrence

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Huntington, West Virginia Joan C. Edwards Comprehensive Cancer Center2,
Huntington, West Virginia St. Mary's Breast Center3, Huntington, West Virginia

Background

We have shown that consumption of walnuts slowed breast cancer growth and/or reduced the risk of breast cancer in mice. Others have shown in animal or cell culture models that walnuts were beneficial against breast, colon and prostate cancer and identified similar putative mechanisms of action.

Hypothesis

The expression of many genes associated with cancer growth, survival and metastasis will be altered by walnut consumption.

Methods

The study was a non-placebo two arm, clinical trial. Women with lumps large enough for the needed research and pathology biopsies were recruited to the trial and provided informed consent at the initial visit. Up to two additional biopsies were taken for gene expression analyses using next generation RNA Sequencing methods. The subject immediately begin to consume 2 ounces of walnuts per day until follow-up surgery, if surgery was needed. At follow up surgery, additional biopsies were taken from the surgically removed, cancerous tissue. Gene expression analyses was repeated and the change in gene expression compared to baseline was determined in each individual woman. Change in gene expression due to walnut consumption was further compared to that of a control group that did not consume walnuts.

Results

RNA-Seq expression profiling revealed over 200 genes significantly changed in the tumor due to walnut consumption. Ingenuity Pathway Analyses showed pathways that were altered. These included increased activity in genes/pathways for apoptosis and cell adhesion and decreased activity of genes/pathways involved in proliferation and cell migration. These results agree with the previous results in animal and cell culture models showing the benefit of walnut against breast cancer.

Conclusion

The results of this small clinical trial support previous pre-clinical studies and support the hypothesis that walnut consumption could be beneficial against breast cancer.

Distance to specialist care is associated with survival in patients with gynecologic malignancies

Audrey Hicks DO, Maggie Espiridion, MS4, Yin Xiong PhD, Douglas Marchion PhD, George Abboud MS, David Silver MD, Nadim Bou Zgheib, MD
OBGYN, Marshall University SOM

Background

Women with gynecologic malignancies in rural regions may have limited access to care and travel long distances for treatment. It's suggested that distance to treatment facility is a barrier to care.

Hypothesis

We investigated the effect of the distance traveled by patients with gynecologic malignancies to a university hospital on disease presentation and outcomes.

Methods

Patients with gynecological malignancies treated at the Edwards Comprehensive Cancer Center and Marshall University were identified using the cancer registry database. Clinical and demographic data was collected utilizing American College of Surgeons/Commission on Cancer and met National and State quality edits. Distance to care (DTC) traveled was calculated in miles and minutes. Finally the DTC data was analyzed with the clinical data.

Results

810 patients with gynecologic malignancies were identified and the data was subject to analysis. With median DTC as a cutoff, short DTC was associated with improved overall survival. Caucasian patients who had a short DTC survived longer than those with longer DTC. No difference in stage, grade, histology, age, family history of cancer, medical comorbidities or insurance type was found with short versus long DTC. A short DTC was associated with more than 4 years since the last pap smear and more than 5 years since the last mammogram. Patients with poor healthcare maintenance records had a worse prognosis.

Conclusion

Geographic proximity to a university hospital influences survival in patients with gynecologic malignancies. This highlights the importance of access for our patients. Further studies may help us identify areas of geographic disparity and potential outreach programs.

Does standardizing albuterol weaning reduce hospital length of stay, readmission rates and rapid response codes?

Audra Pritt, Michelle Worthy

Department of Pediatrics, Joan C Edwards School of Medicine, Huntington WV

Background

IRB Approval pending, data collection to start soon and abstract to be completed once data obtained.

Purpose of Research: To reduce hospital length of stay, readmission rates and rapid response codes in patients with asthma by standardizing albuterol weaning by using a validated scoring system that may be used by respiratory therapists, nurses and physicians.

Hypothesis

Asthma causes significant morbidity and even mortality in the pediatric patient population. Standardizing albuterol weaning could not only reduce hospital length of stay, readmission rates and rapid response codes, but it would then also decrease parental time off work, patient school absences, nosocomial acquired infections, hospital cost and also adverse psychological effects of hospitalization in children. Larger institutions have implemented and studied this model and have shown success, however, we would like to show this model can work at smaller institutions with fewer resources.

Methods

Will retrospectively look at all hospital admissions with ICD-9 and ICD-10 codes of asthma or asthma exacerbation for ages 2-18yo and analyze their length of stay, readmission rates within 30 days and rapid response codes December 2012 through December 2014. Will then retrospectively analyze, during the corresponding time period of December 2014 through December 2016, the same data after implementing albuterol weaning protocol and look for improvement in length of stay, readmission rates and rapid response codes. We will exclude patients with the diagnosis of viral bronchiolitis, croup, chronic lung disease (BPD, CF, airway anomalies, cardiac disease), or who require intubation/ventilator support.

Results

TBD

Conclusion

.TBD

Effectiveness of Home-based Physical Therapy Following Total Knee Replacement Surgery: A Systematic Review and Meta-Analysis of Intervention Studies

Travis H. Dinsmore, Brian J. Warner, Dr. Saurabh P. Mehta, and Dr. Frank D. Shuler
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School of Medicine, Huntington, WV

Background

Background: Physical therapy (PT) is aimed at improving functional status, pain intensity, quality of life, and mobility status after total knee replacement (TKR). Given the cost benefits of Home-based PT (HPT), it should be a preferred mode of PT after TKR. Whether HPT provides comparable outcomes to those achieved via PT provided in an inpatient or outpatient setting after TKR remains unknown.

Hypothesis

Objectives: This meta-analysis evaluated the effectiveness of HPT compared to outpatient or inpatient PT (also denoted as institution-based PT within this text) in patients following TKR.

Methods

Methods: Pubmed, EMBASE, and CINHALL were searched using pre-defined search terms. Randomized control trial or cohort design studies comparing HPT with institution-based PT were included. Pain, knee range of motion (ROM), and self-reported functional status were the outcomes of interest. The risk of bias in the included studies was assessed using the PEDro Scale. The meta-analysis for the outcomes was performed by comparing their Mean Differences (MD) for the groups. P values of <0.05 were considered significant.

Results

Results: The meta-analysis of the pooled data revealed that the HPT was superior in improving knee ROM compared to institution-based PT (MD = 2.07, CI 0.23, 3.91; $p = 0.03$) at 6 months after TKR. However, HPT provided similar benefits in reducing pain intensity (MD = 0.16, CI -0.01, 0.32, $p = 0.06$) and self-reported functional status (MD = 0.01, CI -0.33, 0.36; $p = 0.93$) when compared to institution-based PT.

Conclusion

Discussion/Conclusion: The present meta-analysis of primary studies suggests that home PT provides superior benefits in improving ROM but comparable benefits in improving pain intensity and self-reported functional status over 6 months period following TKR. Due to cost benefits of HPT versus institution-based PT, HPT should be considered as a preferred option for patients being discharged from acute inpatient orthopedic unit after TKR.

Elevation of Endogenous Cardiotoxic Steroids, MBG and TCB, in Renal Failure Patients

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Dept of Biomedical Sciences, Nephrology Division, JCE School of Medicine, School of Pharmacy, and MIIR at Marshall University

Background

It was shown that level of endogenous cardiotoxic steroids (CTS) was elevated under different physiological and pathophysiological conditions. Since there are considerable limitations and variations of ELISA methods, we developed a LC-MS method measuring marinobufagenin (MBG) and telecinoobufagin (TCB), two CTS compounds, in human plasma samples.

Hypothesis

CTS contributes to development of renal failure.

Methods

LC-MS system: Agilent 6490 Triple Quad LC/MS with Agilent 1100 HPLC and autosampler. Column (ZORBAX Eclipse Plus C18 rapid resolution HT, 2.1x50mm, 1.8 micron). Temperature was set at 40°C. Gradient elution was used to separate CTS with mobile phase A (water with 0.1% formic acid) and B (acetonitrile with 0.1% formic acid). Polarity is positive and scan type is MRM. Extraction methods with 10x concentration: liquid-liquid extraction with ether acetate and chloroform. Identification of MBG and TCB was performed by three positive transitions

Results

We optimize extraction/concentration protocol based on matrix effect, pH effect, and release of TCB/MBG from protein(s). Matrix effect in 10x concentrations is a tough problem because of the low level of TCB/MBG. The R² values for TCB and MBG standard curve are 0.9951 and 0.9969, respectively. For TCB and MBG, the detection limit (by standard curve) is 100 pM and quantification detection limit is 250-500 pM in plasma. At pH4.5 which gave best TCB/MBG release, the matrix effect is 75% and 71% for TCB and MBG, respectively, on a 10-fold concentration. Human plasma samples from 5 normal healthy volunteers (age 25-53, 42.4±10.7 year; 2 male and 3 female) and 8 dialysis patients (age 23-55, 43.1±9.5 year; 4 male and 4 female) were collected in K2-EDTA collection tubes (BD) and extracted. The levels of TCB and MBG are significantly higher in dialysis patients than in normal healthy volunteers.

Conclusion

Elevation of circulating CTS might contribute to renal insufficiency, especially in end-stage renal disease, in human beings.

Evaluating Cardiovascular Health in a Rural West Virginia Community with High Risk of Cardiovascular Disease

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Department of Family Medicine, Joan C. Edwards School of Medicine, Huntington, WV.

Background

The American Heart Association (AHA) 2020 Impact Goal aims to improve cardiovascular health of Americans by 20 percent, while reducing deaths from cardiovascular diseases and stroke by 20 percent, all by the year 2020. In order to monitor progress towards the 2020 goal, the AHA defined the concept of "Ideal Cardiovascular Health," according to 7 health metrics, deemed "Life's Simple 7" (LS7). They include smoking status, body mass index (BMI), physical activity, diet, total cholesterol, blood pressure and fasting blood glucose. For each metric, the AHA defined specific criteria for poor, intermediate, and ideal, with a goal of increasing the prevalence of ideal metrics within the population.

Hypothesis

Our goal is to assess the overall cardiovascular health of individuals in a rural West Virginia community (Lavalette, WV) using the LS7 survey. In addition, we aim to assess whether measurement of an Ankle Brachial Index (ABI) (non-invasive screening tool used to assess peripheral artery disease (PAD) and a well-established predictor of cardiovascular health) influences the extent of lifestyle modification over time.

Our prediction is that in individuals with evidence of PAD (ABI < 0.9), improvements in LS7 score overtime will be significant compared to individuals without evidence of PAD (ABI > .9).

Methods

Subjects are randomly assigned to either intervention (ABI and LS7 survey performed) or control (only LS7 survey performed). Individual education was carried out amongst the intervention and control group with the intent of improving their heart score, according to the AHA's LS7, by the time of a follow-up survey 6 months later.

Results

Data collection is ongoing and scheduled to be completed during January-February. While the first round of follow-up surveys is scheduled for April, an initial assessment of overall cardiovascular health for individuals in the population, as well as an assessment of sub-clinical PAD will be complete.

Conclusion

Conclusion pending.

Gene Mutations with Arrhythmogenic Right Ventricular dysplasia/Cardiomyopathy: a cohort registry study

Xiaoliang Qiu, Xin Liu, Yuxin Fan, Wenling Liu

Heart Center, Peking University People's Hospital, Beijing, China; Marshall
University Joan C. Edwards School of Medicine, Huntington, WV, U.S.A; Texas
Children's Hospital, Baylor College of Medicine, Houston, Texas, U.S.A.

Background

Arrhythmogenic right ventricular dysplasia/cardiomyopathy (ARVD/C) is an inherited cardiac disease associated with an increased risk of arrhythmic sudden cardiac death. Mutations in desmosomal genes and some extra-desmosomal genes have been identified to associate with ARVD/C. Previously we identified 5 novel plakophilin (PKP2) mutations in a cohort of Chinese patients with ARVD/C.

Hypothesis

Our present study is to determine the prevalence of other associated gene mutations in this ARVD/C registry study and explore the potential genotype-phenotype relationship.

Methods

Genotypic and phenotypic profiles were studied in a cohort of 32 symptomatic Han Chinese with a clinical or suspected diagnosis of ARVD/C according to modified international Task Force criteria in 2010. Direct sequencing of 5 desmosomal genes and 3 extra-desmosomal genes was performed with a 3730XL DNA Analyzer.

Results

17 mutations including 7 novel (7/17, 41.1%) in 4 desmosomal genes PKP2, Desmoplakin (DSP), Desmoglein-2 (DSG2), Desmocollin-2 (DSC2), were identified in 18 (18 of 32, 56.3%) patients in our cohort. No mutations were found in extra-desmosomal genes. Among 32 patients, 11 (11 of 32, 34.3%) patients have PKP2 mutations, 3 (9.4%) DSP, 3 (9.4%) DSG2, 4 (12.5%) DSC2. Multiple mutations were found in 5 subjects (5 of 32, 15.6%). Genotype-phenotype analysis did not show any difference between patients with and without mutation.

Conclusion

PKP2 mutation is the most common gene mutations in our ARVD/C cohort. Extra-desmosomal genes mutations are rare in Chinese patients with ARVD/C. Genotype-phenotype analysis did not show any difference between patients with and without mutation.

**GEOGRAPHICAL AND TEMPORAL VARIATION IN THE INCIDENCE AND
MORTALITY OF OPIOID USE AT A GLOBAL, NATIONAL AND STATE LEVEL:
1990-2015.**

Aguilar R, Hunter Z, Shade M, Sanabria JA, Klug R, Modarresi M, Gillon B, Sanabria
J and the GBD Collaborators.

Marshall University School of Medicine. Institute of Human Metrics and Evaluation,
Washington University

Background

Mortality and morbidity from opioid use has increased significantly due to both recreational and prescription forms. Data has shown that after alcohol intoxication, opioids are the most common cause of poisoning in patients presenting to emergency departments in US.

Hypothesis

The incidence and mortality of opioid use has increased significantly over the last three decades at global, national and state level.

Methods

The global burden of disease (GBD) is an annual effort to measure the health of populations at regional, country, and selected subnational levels, from 1990 to the most recent year. The GBD produces estimates of mortality and morbidity by cause, age, and sex. In addition, the GBD measures many health system characteristics and risk factor exposure. For the present analysis, we report on 188 countries the incidence of opioid use and their associated risk factors with emphasis in USA and WV.

Results

The global incidence of opioid abuse has increased from 790,669:516,071 male:female ratio in 1990 to 1,167,939:810,903 in 2015 with a geographical variation. Higher consumption rates were noted in Iran, United Arab Emirates and Australia. More alarming, the opioid rate increases from 38,021:31,529, male:female ratio in 1990 to 67,744:56,605 in 2015 in the United States, a 79% increase over three decades. The most affected States were Alaska, Washington DC, and Nevada. In addition, the incidence of opioid use was 260:230, male:female in 1990 compared to 422:348 in 2015 in WV, an increase over 60% in the last 25 years. Of most concern, the most affected opioid associated mortality population changed from 30-34 years-old age-group to the 25-29 years-old age-group. Similar pattern was observed at the State level.

Conclusion

The incidence of opioid abuse has increased at the global level and it has doubled in the United States. WV has been affected with this epidemic.

Increase in Cancer Risk due to Radiation by CT-Scans Ordered in Orthopaedics Surgery Department?

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Background

CT Scanning has become one of the primary modalities for diagnosing and confirming conditions. With increased use of this imaging, the concern for ionizing radiation damage to DNA has increased as well. It is mentioned that a CT examination with an effective dose of 10 millisieverts is associated with an increase of fatal cancer 1 in 2000 people.

Hypothesis

Aim of this research is to shine light on the fact that this number doesn't represent CT imaging done for extremities (i.e. knee, ankle, and foot) that are commonly ordered in orthopaedic practice.

Methods

Review of articles and current research being done on effects, measurement level of radiation/effective dose, techniques and methods used for CT-scan imaging. Review articles were selected from PubMed.

Results

Effective dose of radiation created by CT scan can depend on weight, height, technique and level of strength of the beam. This range is typically anywhere from 1-10 mSv, which is not much lower than the one experienced by Japan atomic bomb survivors (5-20 mSv). when pediatric population is evaluated, this range is changed to 5-60 mSv.

One study measured the level of radiation at different areas in the body. CT scan done on chest, abdomen and pelvis was demonstrated to have a significantly higher radiation dose (5.27, 4.95, 4.85 mSv respectively) than the CT effective dose for knee and ankle (0.16, 0.07 mSv respectively).

Conclusion

As described, repeated CT imaging is associated with increase in fatal soft tissue oncogenic conversion (i.e. thyroid, abdomen and gonads); however, the further the distance of the imaging from these vital organs, the lower the suspected risk. This has to do with the decrease in measured effective dose of radiation at these sites. As a result, the described risk of high rate of cancer by CT scans doesn't justify majority of scans ordered for Orthopaedic surgeries.

In-Hospital Complications of Total Joint Arthroplasty

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Background

Elective total joint arthroplasty (TJA) is considered a relatively safe procedure; nevertheless, rare complications can jeopardize outcomes or even lead to the demise of patients.

Hypothesis

The aim of the current study was to investigate in-hospital complications after TJA and create a preoperative risk calculator to predict individuals' risk for developing those complications.

Methods

We conducted a retrospective, multi-institutional study including 78,593 TJAs performed between 2000 and 2014; 39,724 total knee arthroplasties (TKAs) (34,206 primaries, 5,518 revisions) and 38,859 total hip arthroplasties (THAs) (31,298 primaries, 7,561 revisions). We assessed risk factors, including: procedure type, age, sex, body mass index, and Elixhauser & Charlson comorbidities. Over 470 potential complications were queried from the institutional databases using the International Classification of Diseases, Ninth edition, codes and the complications were stratified as: cardiovascular (CV), pulmonary, neurological, gastrointestinal (GI), genitourinary (GU), deep venous thrombosis (DVT), pulmonary embolism (PE), infection, and mortality.

Results

Overall, the incidence of in-hospital complications after TJA was 14%, of which 4,365 (46%) were CV, 1391 (14.8%) GU, 1148 (12.2%) infection, 892 (9.5%) neurological, 656 (7.0%) pulmonary, 458 (4.8%) GI, 319 (3.4%) PE, and 227 (2.4%) DVT. The in-hospital mortality rate was 0.02% (15 patients). The following variables were determined to be significant predictors of overall complications: revision TJA (odds ratio[OR]:5.9;95%Confidence Interval[CI]:5.6-6.3);pulmonary circulation disease(OR:5.5;95%CI:4.6-6.5);paralysis(OR:2.4;95%CI:1.7-3.4);elevated Charlson score(OR:2.07;95%CI:2.0-2.15);obesity(OR:2.0;95%CI:1.8-2.3);bilateral T J A (O R : 1 . 9 ; 9 5 % C I : 1 . 8 - 2 . 1) ; a l c o h o l abuse(OR:1.6;95%CI:1.2-2.3);THA(OR:1.3;95%CI:1.2-1.4);fluid/electrolyte disorders(OR:1.2;95%CI:1.3-1.6),and female gender(OR:1.2;95%CI:1.1-1.15).

Conclusion

Notwithstanding its immense success, TJA can be associated with numerous complications. This study on a very large number of patients, from multiple institutions, provides a detailed list of possible complications after TJA. Some of the risk factors for in-hospital complications are modifiable, including obesity and alcohol abuse, while others can be optimized such as the metabolic disorders and pulmonary circulation problems. Understanding the risk factors for in-hospital complications and mortality after TJA will allow appropriate utilization of resources to reduce this burden.

Liposomal Bupivacaine Injections May Decrease the need for Narcotics in Post Operative Pain Control for Gynecological Oncology Patients

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Background

The use of narcotics in post operative course is a common practice in many centers around the USA, however with the increased rate of narcotics abuse, surgeons are now looking at adopting non narcotics approaches to control postoperative pain and improve surgical recovery. Liposomal bupivacaine (Exparel) is a recent anesthetic agent introduced with an inherent longer half life interval, which might decrease the rate of narcotics use post operatively and the risk of dependence and abuse. This study examined immediate postoperative narcotics use and pain scales in two sets of patients, those that had received liposomal bupivacaine and those that had not.

Hypothesis

Our hypothesis is that the patients who received Exparel would require less postoperative narcotics.

Methods

This is a retrospective cohort study examining women who underwent a robotic hysterectomy performed for gynecological problems (benign and malignant) by a single gynecologic oncologist at Cabell Huntington Hospital and Marshall Health over the last 2 years. The control group did not receive Exparel. The cohort group received 20cc of Exparel subcutaneously injected during the surgery. The primary outcome was amount of narcotics used during hospital admission immediately after surgery. We also examined BMI, length of stay (LOS), age, creatinine, subjective pain scale, race, previous narcotics use, and whether the case involved a malignancy.

Results

In preliminary data, we examined 26 patients, 13 in each group. The groups were comparable in age, BMI, LOS, creatinine, subjective pain scale, race, previous narcotics use and whether or not the case involved a malignancy. There was no statistical significance in subjective pain scale or narcotics use during hospital admission.

Conclusion

Given the small sample size of this study, there was not enough data to determine if Exparel decreased the amount of narcotics required for postoperative pain control. We are currently compiling more data to further examine use of Exparel.

Long Term Outcomes of Peptide Vaccinations for Advanced Stage Melanoma

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Background

The current approach for the treatment of melanoma consists of surgical resection of the primary tumor, and further resection of isolated metastases, as well as chemotherapy for circumstantial cases of metastatic melanoma. However, where chemotherapeutic approaches have not proven to prolong the median survival of patients with advanced disease, immunotherapeutic approaches show potential for more favorable clinical outcomes in these patients.

Hypothesis

This study is a continuation of the Mel31 phase II trial which tests the hypothesis of increased clinical responses to synthetically manufactured peptide vaccines, administered in adjuvant via two different mechanisms, to further accrue patients into Stage 2 of the trial.

Methods

Patients were initially randomized into one of two arms of the trial to receive the peptide vaccinations either ex vivo pulsed with dendritic cells (arm 1), or in vivo to Langerhans cells activated with granulocyte-macrophage colony-stimulating factor and an incomplete Freund's adjuvant (arm 2).

Results

The Mel31 publication reported outcomes at the end of Stage 1, at which point it was determined to keep only arm 2 open to further enrollment of patients into Stage 2 of the trial, clinical data for which has yet to be reported until now.

Conclusion

Fifteen years after the initiation of the trial, clinical response, immune response and toxicity data from Stage 2 is ready to be reported, as well as long-term survival outcome for all the patients in the trial, to demonstrate the efficacy of two different routes of synthetic peptide vaccine administration as a therapeutic approach to advanced stage melanoma.

**Maternal and Fetal Outcomes Associated with Maternal Coronary Artery
Disease: A Retrospective Chart Review**

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Background

Cardiovascular disease is the leading cause of maternal mortality in developed nations. Coronary artery disease is uncommon in premenopausal women - complicating 1 per 1000 pregnancies. This incidence is likely to increase with the increasing prevalence of known risk factors. Normal physiologic changes of pregnancy can also exacerbate underlying CAD. Little clinical data is published about the management of pregnancy in patients with CAD.

Hypothesis

The objective of this study was to define the maternal and fetal outcomes of pregnant women with a history of CAD prior to pregnancy and to propose recommendations for management of such patients.

Methods

Cases were identified by systematic review of our institution's inpatient and outpatient electronic medical records. Inclusion criteria comprised a diagnosis of CAD preceding pregnancy. Patient clinical and demographic data and delivery data were collected. The maternal outcomes of interest were cardiac arrest or cardiac death, acute coronary syndrome, MI, and pulmonary edema.

Results

The average maternal age was 34 years. Average BMI was 35. Eleven of twelve patients were smokers. Five of twelve patients had diabetes. Chronic hypertension affected nine of twelve patients. Seven of twelve patients suffered from hyperlipidemia. Delivery outcomes included an average gestational age of 36 weeks, average birth weight of 2878 grams, average APGARs of 7 at 1 minute and 8 at 5 minutes, and average neonatal length of stay of 4.7 days. There were no maternal complications of ACS, MI, PE, or death.

Conclusion

To our knowledge, this is the first study reporting no maternal deaths or complications of ACS, MI, or PE. We believe the active antepartum testing and interventions related to maternal hemodynamics are the most important contributors to these outcomes. Equally as important is the multispecialty approach to the management of these high-risk obstetric patients.

Medial Elbow Joint Space Width during a Valgus Stress Test; The Effects of Flexor Pronator Mass Fatigue

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Background

The flexor pronator mass (FPM) along with the ulnar collateral ligament provide medial elbow stability during the throwing motion. Fatigue of the FPM (reduced wrist flexion strength) might contribute to decreased medial elbow stability. This project explored the effects of FPM fatigue on the medial elbow joint space width during a valgus stress test.

Hypothesis

We hypothesized that FPM fatigue will result in an increase in medial elbow joint width during the valgus stress test.

Methods

Seven healthy participants (142 ± 10.9 cm, 48 ± 10.4 Kg) volunteered for this study repeated measures investigation. Ultrasound images of the medial elbow joint space were collected during a valgus stress test, images were collected prior to and immediately following a wrist flexor exercise fatigue protocol. Measurements of the medial elbow joint space width were entered into a two-way repeated measures ANOVA (stress x fatigue).

Results

The wrist flexor strength decreased (19.6%, $P=0.002$) following the fatigue protocol. The medial joint space width increased during the valgus stress test (0.78mm, $P<0.001$). The medial joint space width increased following the fatigue protocol (0.08mm, $P=.048$). The stress by fatigue interaction was significant ($P=0.009$) medial joint space width in the unstressed condition was not different following the fatigue protocol (0.02mm, $P=0.550$), while following the fatigue protocol the medial joint space width increased during the valgus stress test (0.15mm, $P=0.017$).

Conclusion

The fatigue protocol achieved FPM fatigue, evidenced by the 19.6% decreased in the wrist flexor strength. The results supported our interaction hypothesis that after the fatigue protocol medial joint space width in the unstressed condition was unchanged, while medial joint space width during the valgus stress test increased. This research establishes the significance of FPM fatigue on medial elbow stability under valgus stresses. Further research should be conducted to identify the effect of FPM fatigue following throwing.

MiRNA and Biomarkers of Metabolic Syndrome: Correlating biomarkers for early detection of metabolic syndrome in obese females in West Virginia

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Background

Metabolic syndrome, a multifactorial disease, causes complications like cardiovascular disease and diabetes mellitus. Clinical diagnosis is present after signs and symptoms develop once the disease has already progressed. Due to the indolent nature of metabolic syndrome and healthcare disparities, populations like those in West Virginia suffer a significant disease burden. Along with comprehensive community based programs for disease management, prevention and early intervention are vital components to combatting this disease. As metabolic syndrome develops, altered levels of cytokines and miRNAs are measurable in the circulation. We aimed to construct a panel detecting abnormal levels of cytokines and miRNAs in patients at risk for metabolic syndrome.

Hypothesis

A pattern of biomarkers and miRNA related to metabolic syndrome are measurable in the serum of patients at risk for developing metabolic syndrome.

Methods

Participants included 54 patients from a Family Medicine Clinic at Marshall University School of Medicine grouped into categories based on BMI and metabolic syndrome diagnosis: Control, Obese, Metabolic Syndrome. Serum levels of leptin, adiponectin, leptin: adiponectin ratio, IL-6, six microRNAs (320a, 197-3p, 23-3p, 221-3p, 27a-3p, and 130a-3p), were measured.

Results

Among the three groups, leptin, and leptin: adiponectin ratio, and IL-6 levels were highest in MetS, and levels in Obese were greater than Control ($p > 0.05$). Adiponectin levels were lower in Obese compared to Control, but lowest in MetS ($p < 0.05$). MiRNAs levels were lowest MetS, and levels in Obese were lower than Control ($p > 0.05$).

Conclusion

Our results support the clinical application of biomarkers in diagnosing early stage metabolic syndrome, in a population of adult females in West Virginia. This would enable attenuation of disease progression before onset of irreversible complications. Since West Virginians are high-risk for developing metabolic syndrome, our biomarker panel could reduce the disease burden on our population.

Outcome Assessment of Diabetes Coalition Participation in Self-Management Behaviors

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Background

Each coalition in the Appalachian Diabetes Coalition program is led by a partnership of local organizations. Coalitions have unique goals and they voluntarily report to Marshall University about community participation, which is used to determine the sustainability programs. This project is in response to the need to link participation to measurable clinical health outcomes.

Hypothesis

High adherence score will lead to a clinically significant change such as a =5% decrease in weight and/or a blood pressure of =140/90

Methods

Data was collected from October 2015 to March 2016. Variables of interest are: weight, blood pressure, smoking status, mobility and nutrition. Each participant was provided with a booklet, and asked to estimate their weekly activity level at the beginning and end of the week. The ability of participants to successfully complete weekly self-assigned task was determined to be their degree of adherence.

Results

Of the 27 community members who participated, the average participant age was 59 years old. There were 44.4% male and 51.9% female participants. At baseline, lowest participant weight was 110.7 and highest was 392 lbs. The average adherence score in October was 5.3/9 and 5.8/9. in March. 11% of participants achieved a systolic blood pressure of =140, 22.2% had a diastolic blood pressure =90, 1% achieved a >5% weight loss. Of the 27 participants, only three people had a blood pressure of =140/90.

Conclusion

Most participants did not meet the cutoff values, but many achieved some health changes. Since this was a buy-in-study, participant's adherence score is reflective of participation in the study. Although coalitions have made strides within communities, this study shows that participant commitment plays a significant role in attaining clinically measurable benefits. Therefore, the process of using coalition reporting as a measure of sustainability may not be sufficient to determine the clinical effectiveness of programs.

Outcomes after Rib Fractures in Geriatric Blunt Trauma Patients

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Background

Blunt trauma in the geriatric population is fraught with poor outcomes, with rib fractures contributing substantially to morbidity and mortality.

Hypothesis

To evaluate blunt trauma patients ≥ 65 years with rib fractures over a 6-year period, to determine the impact on mortality, hospital and ICU stay, need for mechanical ventilation(MV), and overall outcomes.

Methods

We retrospectively reviewed 255 patients ≥ 65 years old at a level 2 trauma center between January, 2010 and December, 2015, who sustained blunt trauma resulting in rib fractures. We collected admission vital signs, base deficit, Glasgow Coma Scale(GCS) score, Revised Trauma Score(RTS), Injury Severity Score(ISS), number and location of ribs fractured, and presence of a hemothorax or pneumothorax. Outcomes measured include mortality, hospital length of stay(LOS), intensive care unit(ICU) admission, ICU LOS, need for MV, and MV days.

Results

There were 24 deaths(9.4%), of which 7 were early(< 24 h). There were 130 patients(51%) admitted to ICU, and 49(19.2%) of these required MV. The mean ICU and MV days were 5.9 and 6.3 days respectively. ICU admission was predicted by a base deficit < -2.0 , ISS > 15 , bilateral rib fractures, a pneumothorax or hemothorax on chest x-ray(All $p < 0.001$), as well as hypotension, GCS < 15 , and 1st rib fractures(All $p < 0.05$). Mortality was predicted by a base deficit < -5.0 , a GCS score of 3(Both $p < 0.001$), as well as hypotension, ISS=25, RTS < 7.0 , bilateral pneumothoraces, 1st rib fractures, and > 5 rib fractures(All $p < 0.05$). Age did not independently predict survival, but increasing age was associated with a longer LOS($p < 0.001$). Higher ISS predicted a longer LOS in survivors($p < 0.001$). Men had significantly more rib fractures than women($p = 0.003$), and survivors had fewer rib fractures than those who died($p = 0.004$).

Conclusion

Rib fractures in elderly blunt trauma patients are associated with significant mortality and morbidity, but outcomes can be predicted to allow for early and aggressive intervention and disposition, especially in facilities that do not have adequate ICU and MV capabilities.

Parent Care Notebooks (PCN) for Children and Youth with Special Health Care Needs (CYSHCN): A 2016 Survey of State Title V Directors on Prevalence, Content, and Effectiveness Compared to 2007

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Background

PCNs for CYSHCN are a family-centered tool frequently provided by State Maternal and Child Health Departments to improve communication and coordination within the medical home. They may include care plans, emergency information, medical histories, medication lists and resource guides. The American Academy of Pediatrics (AAP) has recently developed a "build your own PCN" website for parents. The prevalence and effectiveness of PCNs may have increased nationally since our previous survey in 2006.

Hypothesis

T

Methods

All State Director of Title V and CYSHCN Department and the District of Columbia were surveyed electronically and by mail to evaluate the prevalence, content and effectiveness of PCNs.

Results

The response rate for the 2016 survey was 76% (39/51) vs 29% response (15/51) IN 2007. PCNs were currently provided by 52% of the states compared the earlier rate of 38%. The majority of PCNs had been in use for > 5 years, revised at least once and developed by a team of state administrators, health professionals and parents. The most effective component of the PCNs were identical in both surveys - organizing/recording of information and improving communication in both diagnosis and treatment. Similarly the least effective areas were addressing school, social and behavioral issues or explaining state departmental programs and policies. There were no significant differences in content or effectiveness between the two surveys. Although only 10 (26%) programs responding were acquainted with the AAP "Build Your PCN" website, 8 (40% of those with PCNs) had developed their own online version. Seventy percent of states providing PCNs believed that they enabled parents to feel more in control of and involved with their child's health care.

Conclusion

The use of PCNs nationally has increased over the last nine years They may be most useful to record and communicate information and improve family-centered care for CYSHCN.

Physicians' Antibiotic Prescribing Rates for Respiratory Tract Infections In A Private and Urgent Care Setting

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Background

Studies have shown that inappropriate use of antibiotics has contributed to antibacterial resistance, adverse effects, and has placed an unnecessary financial burden on patients and the healthcare system. This problem is particularly prevalent in the pediatric population. The literature shows that approximately 27% of respiratory tract infections are bacterial and warrant antibiotics, however antibiotics are given twice as often as expected in outpatient visits. This quality improvement project aims to identify the rates of antibiotic prescribing in Marshall Pediatric's private clinics and the NowCare as well as introduce interventions to decrease inappropriate prescribing practices.

Hypothesis

More antibiotics are likely to be prescribed at NowCare than in the private clinic setting where pediatricians are more accustomed to practicing on a day to day basis and may be more willing to discuss why antibiotics aren't indicated with patients.

Methods

Charts were reviewed of pediatricians who did both private clinic and NowCare for sick visits (100 charts/setting for 12 physicians). Target words (cough, nasal congestion, fever, earache, sore throat) in the HPI prompted the recording of data. Antibiotic prescriptions and their appropriateness were documented.

Results

There was no significant difference between the amount of antibiotic prescriptions given for respiratory tract infections in a private setting versus NowCare (581 to 582). The overall prescribing rates were similar to national averages, which is twice the amount of antibiotics indicated for bacterial upper respiratory tract infections. To date, we have implemented the first of our quality improvement interventions, the presentation of data and education to faculty at grand rounds.

Conclusion

Peer comparison and education with audit are techniques that have been shown to improve antibiotic prescribing practices in the literature. We have collected our baseline data and started the process of quality improvement cycles to decrease inappropriate antibiotic prescriptions.

Pica Prevalence in a West Virginian Dialysis Population

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Background

Pica, or the eating of non-food substances, has a recognized association with certain medical disorders, including end stage renal disease requiring dialysis (ESRD). Such patients have described obsessive-compulsive disorder-like urges for ingestion of particular substances or textures. There may also be cultural influences to the behavior. ESRD requiring dialysis causes not only significant lifestyle changes and psychological stressors, but physical changes, given the inability of the body to excrete substances through the kidneys. Ice chips, chalk, dirt, clay, and rubber have been well documented as recurring target substances. Studies examining the prevalence of pica in dialysis patients have findings ranging from 10 to 38.3%.

The prevalence of pica has not been examined in rural populations, including an Appalachian population. Also, despite possible theories regarding a link to psychiatric issues, there has been no study examining specific psychiatric symptoms or diagnoses in relationship to pica in dialysis populations.

Hypothesis

We hypothesize that a significant portion of the dialysis patients in our study will not only demonstrate pica behaviors but also may demonstrate some psychiatric conditions, including depression and/or obsessive compulsive behaviors.

Methods

In this study, we examined 80-120 patients at a rural, Appalachian outpatient dialysis center for the presence of pica. Prevalence of pica was determined using a normalizing script and structured interview to assess. Demographic and clinical variables were also assessed. In addition, we examined possible associated psychiatric symptoms by using a cognitive screen (the Folstein MMSE), a screen for depression that is valid in medically ill populations (the Geriatric Depression Scale), and a screen for obsessive-compulsive disorder (the Florida Obsessive-Compulsive Inventory or FOCI). Finally, patients' lab work including BMP, CBC w/differential, and TSH was also obtained via chart review.

Results

Data will be analyzed using SPSS for analysis of the hypotheses. (IN PROGRESS)

Conclusion

(IN PROGRESS)

Prevalence of Obesity and Clinical Characteristics of Allergic versus Non-allergic Rhinitis in Children

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Background

Rhinitis is inflammation of the nasal mucosa that includes two major types, allergic and non-allergic. Studies have shown a positive correlation between obesity and non-allergic rhinitis in adults. Given that our patient population has a high incidence of childhood obesity, determining if a correlation exists between obesity and allergic and non-allergic rhinitis is imperative as this is a modifiable risk factor.

Hypothesis

A positive correlation between childhood obesity and incidence of non-allergic rhinitis was the expected outcome.

Methods

A retrospective study was conducted on patients between the ages of 2-17 years presenting to the Marshall University Allergy/Immunology Clinic between October 2014 and May 2016. Clinical and laboratory characteristics assessed included anthropometric measurements, presenting symptoms, comorbid atopic condition, evidence of aeroallergen or food sensitization via skin prick test (SPT) or serum specific IgE testing, total serum IgE, and absolute eosinophil counts. Rhinitis was defined as allergic or non-allergic based on evidence of aeroallergen sensitization via positive SPT or intradermal testing to aeroallergens or serum specific IgE levels to greater than 0.10kU/L. Obesity was defined as BMI > 95th percentile for age and sex.

Results

251 patients were identified with the diagnosis of allergic or non-allergic rhinitis. The analysis of variance (ANOVA) was used to analyze our continuous variables and the chi-square test was used to analyze the categorical variables. No statistical difference was found between childhood obesity and prevalence of non-allergic rhinitis. A possible association was found between obesity and a lower likelihood of allergic rhinitis due to mold sensitization.

Conclusion

This study did not find a statistically significant relationship between allergic or non-allergic rhinitis and childhood obesity. However, we did see a possible correlation between obesity and decreased allergic rhinitis due to mold. Further study is needed to pursue this finding as this study may be underpowered to detect a true difference.

**Quality Improvement Project Evaluating the Use of High Fidelity Simulators
During Mock Codes in Trying to Improve Both Confidence and Competency in
Trainees**

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Background

According to Dull et al, the purpose of simulation is to educate through “active, repeated clinical experiences, giving and receiving immediate feedback, teaching leadership skills, and leveraging the controlled setting for predictable learning objectives, all while maintaining a safe learning environment.” The goal of simulation is to replicate patient care scenarios in a realistic environment in order to receive both feedback and assessment.

Hypothesis

We believe that the use of high fidelity simulators will improve confidence and competence of medical students with code scenarios.

Methods

The 3rd year medical students were randomized between two groups high fidelity simulator or the regular manikin during their pediatric rotation. Each student took a pre-intervention confidence survey. Then both groups had a one hour session with a pediatric intensivist learning a modified PALs algorithm for code training. They were then divided up into the two respective groups and had an additional one hour session for hands on training for the various components of the code scenario, i.e. CPR, intubation, IO placement. Each student was then tested individually for competency using a standardized code scenario. Then each student took a post-intervention confidence survey. A total of three rotation groups have participated.

Results

There was no statistically significant difference in confidence between study groups; however, there was a statistically significant difference in competence of several components of the scenario, including checking airway, checking breathing, checking pulses, and checking capillary refill, with high fidelity simulator group performing better than regular manikin group.

Conclusion

The use of the high fidelity simulator did not show any improvement in confidence of medical students with code scenarios when compared to regular manikin. However, the use of the high fidelity simulator did show improvement in competency of some key components of code scenarios when compared to regular manikin.

Relationship between maternal clinical symptoms and neonatal abstinence syndrome outcomes in mothers in the MARC program

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Background

Neonatal Abstinence Syndrome (NAS) results from in utero drug exposure. Cabell Huntington Hospital reports an in-uterine drug exposure rate of 185.5 per 1000 live births, and approximately 50% of these neonates develop NAS that requires pharmacological intervention. Currently, no clinical tools are available to accurately predict which babies will have NAS severe enough to warrant medically assisted treatment. Several studies have shown in non-drug exposed neonates that the magnitude of maternal stress and depression is predictive of pregnancy outcomes including NICU admissions. It is thus likely that maternal depression and stress may play a role in whether a neonate requires therapy for NAS. This study investigates the medical records from pregnant women in a buprenorphine replacement program and their neonates. This study will correlate mothers' psychiatric and somatic symptoms through the PHQ-SADS (Patient Health Questionnaire) as well as other relevant information with NAS outcomes.

Hypothesis

We hypothesize that maternal depression and anxiety will correlate with neonate NAS outcomes.

Methods

This study is a review of pregnant patients enrolled in Marshall Obstetrics' program for buprenorphine replacement therapy as well as their newborns. The patient information assessed includes the PHQ-SADS, program success outcomes, electronic health records for relevant medical and substance abuse history, and psychiatry notes. The medical records of the neonates were reviewed for data on umbilical cord toxicology, head circumference, birth weight, birth length, gestational age, length of stay, and neonatal abstinence score from the first day of life to date of discharge.

Results

We anticipate that we will demonstrate a connection between maternal stress and depression with newborn outcomes.

Conclusion

The identification of a predictive measurement for neonatal outcome inferred from the results of this study provides the potential for improvements in therapeutic care and a decrease in the incidence and severity of NAS.

Retrospective analysis of outcomes from use of a novel carbon fiber implant for oncologic and fracture treatment

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Background

Traditionally, metal implants are the standard-of-care when repairing pathologic fractures. They are cost-effective, have high tensile strength, and provide adequate support. However, they are radio-opaque and cause artifacts on MRI imaging, which limits the surveillance of bone healing and tumor activity in cancer patients. Recently, carbon fiber composite implants have been used as a treatment modality. Carbon-fiber-reinforced polyetheretherketone (CFR-PEEK) has minimal artifacts on MRI, complete radiolucency on radiographic imaging, and has superior fatigue strength compared to traditional implants. This study aims to analyze the outcomes of using CFR-PEEK implants in orthopedic fracture repairs of oncologic patients.

Hypothesis

Carbon fiber implants offer a viable alternative to traditional metal implants without significantly increased intraoperative fluoroscopy times or implant related complications.

Methods

A retrospective analysis of 31 patients with carbon fiber implants was done. All of the patients considered were oncologic. Fluoroscopy time, and implant related complications were recorded. These factors were then compared to reported rates for traditional metal implants compiled from existing literature.

Results

There was one implant-related failure (3.2 percent of cases), resulting in hypertrophic nonunion over the fibula. 5 patients had wound complications, mainly failed wound flaps possibly influenced by previous cancer treatment. Carbon fiber implants had slightly longer fluoroscopy times than traditional metal implants. Average time for a femur nail Carboxifix implant was 109.6 seconds, versus 106.2 seconds for the metal implant. Average tibial nail fluoroscopy time was 87.08 seconds for carbon fiber, and 71 seconds for the metal implant

Conclusion

Carbon fiber implants offer potential advantages over metal implants including MRI compatibility and superior fatigue strength. In this case series, there was a low rate of implant related complications (3.2 percent) and no statistical difference in fluoroscopy times. We conclude that carbon fiber implants offer a viable alternative to metal implants. Further study is needed to further demonstrate their advantages.

Retrospective Analysis of the Use of the X-Ream System for Avascular Necrosis of the Femoral Head

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Background

In this retrospective analysis we aimed to determine if the X-Ream system along with a calcium phosphate composite graft, reduced the incidence of collapse due to avascular necrosis of the femoral head when compared to the natural progression of avascular necrosis and core decompression without injection of a calcium phosphate composite graft.

Hypothesis

Our goal was to be prove that the X-ream system for core decompression for the treatment of avascular necrosis of the femoral head leads to lower incidence of collapse of the femoral head as compared to the natural progression and core decompression without the injection of a calcium phosphate composite graft.

Methods

Our data consisted of 32 total patients with 46 hips operated on in this retrospective study. Radiographs were used to determine collapse during follow up appointments. We compared the X-ream system to the natural history of avascular necrosis as well as compared to core decompression without the use of the composite graft substance.

Results

The X-ream is effective in reducing the number of collapses that occurred when compared to the natural history of collapse of avascular necrosis. 31 hips (67.39%) survived with the X-ream system while the natural history is 59% survive[1] (p-value =0.01). However, when compared to core decompression alone there was no significant difference between the two methods (p-value = 0.699). The X-Ream system had 31 hips (67.39%) survive, while core decompression without the composite graft had 70% survive[2].

Conclusion

The results conclude that the X-Ream system is better than the natural progression of avascular necrosis of the femoral head. When compared to core decompression alone, the X-Ream system was found not to be significantly better or worse. Since the X-Ream procedure costs substantially more than core decompression alone, its use may not be appropriate as it would save healthcare dollars by not performing the X-Ream procedure.

Retrospective review of macula off rhegmatogenous retinal detachment: visual and anatomic outcomes in relation to lag time between loss of vision and surgical intervention.

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Hypothesis

We expect improved visual and anatomic outcomes following macula-off rhegmatogenous retinal detachments for patients who have less lag-time between onset of visual symptoms and surgical intervention.

Methods

We performed retrospective case series review of all cases of macula-off rhegmatogenous retinal detachment at the West Virginia Eye Institute from June 2012 to June 2016. 235 patients were identified who carried the diagnosis of retinal detachment and/or retina tears and underwent pneumatic retinopexy and/or pars plana vitrectomy. Main outcomes were final visual acuity and anatomic results and were analyzed in relation to the lag-time between the vision loss and surgical intervention. Secondary outcomes were the surgical technique and the development of cataract, glaucoma, epiretinal membrane (ERM), and proliferative vitreoretinopathy (PVR).

Results

Significant differences were found in the visual acuity outcome in the group with fewer than 3 days of lag-time. There was a difference in anatomic results in relation to lag-time. Scleral buckle in combination with pars plana vitrectomy was more frequently employed when lag-time was greater than 72 hours. 32.34% of the patients developed cataracts requiring eventual surgery. 5.96% of the patients developed glaucoma requiring topical drops and 2.13% needed surgical intervention. ERM developed in 21.28% of the patients in a mean time of 7.7 months. PVR developed in 20.43% of the patients in a mean time of 4.7 months. There was a significant between the secondary complications of the surgery and the lag-time.

Conclusion

1) Better visual acuity outcome may be expected with earlier surgical intervention in less than 3 days. 2) There was no anatomic difference in relation to the lag-time beyond 24 hours. 3) Longer lag-time was frequently associated with utilizing scleral buckle in combination with pars plana vitrectomy and silicon oil. 4) Higher rates of secondary surgical complications were seen with longer lag-time.

Revamping Mortality and Morbidity Conference to Improve Quality of Health Care.

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Background

The Morbidity and Mortality (M&M) conference has existed and evolved through the years as a tool for health care professionals to review and examine medical errors and adverse outcomes in an attempt to prevent their recurrence. A significant percentage of various national internal medicine and pediatric training programs have reported the lack of clear function and structure of their M&M conference. On the other hand, there have been multiple projects performed in different institutions to transition and transform the M&M conference to have more defined roles and more organized preparation plans.

Hypothesis

To evaluate the success in revamping and restructuring the morbidity and mortality (M&M) conferences in Cabell Huntington Hospital to be systems-oriented, free of individual-blame culture, to involve multidisciplinary participation, and to have more impact on safety and quality of health care.

Methods

We will perform multiple cross-sectional survey studies, and serial run charts and analyses pre and post the implementation of the new structure of the M&M conference. The surveys will be circulated to the attendees of the M&M conferences. This will include attending physicians, resident physicians, nurses, pharmacists, and respiratory therapists in CHH. We will start with the department of pediatrics, and then generalize the same process to other departments in the hospital.

Results

A good portion (41%) of the surveyed audience of the pediatric M&M conferences agree that the attendance and participation in these conferences are multidisciplinary. □ The revision of the attendance sheets of the pediatric M&M conferences held between June-2014 to June-2016 showed that the conference is poorly attended by healthcare professionals other than physicians or medical students. Although the majority of the surveyed audience is aware of the incident reporting system in CHH, the majority has never used it before

Conclusion

The study is still in process.

Review of Palivizumab Prescribing in Neonates During Two Consecutive Respiratory Syncytial Virus Seasons.

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Background

Palivizumab is used to prevent high risk neonatal patients from contracting respiratory syncytial virus (RSV). The American Academy of Pediatrics (AAP) updated the palivizumab prophylaxis prescribing guidelines between the 2013-2014 and 2014-2015 RSV seasons.

Hypothesis

The primary objective of this study is to determine if providers followed current guidelines for prescribing palivizumab administered during 2 subsequent seasons.

Methods

This study is a retrospective cohort comparing the 2013-2014 and 2014-2015 RSV seasons for compliance to the guidelines, defined by AAP recommendations for prescribing palivizumab. Medical records of 88 neonatal patients admitted to Cabell Huntington Hospital who received a dose of palivizumab during their inpatient Neonatal Intensive Care Unit admission between 11/4/13 and 3/10/15 were reviewed. Patient's birth date, date and dose of palivizumab, gestational age at birth, sibling status, oxygen requirements, vasopressor therapy, and the medical conditions bronchopulmonary dysplasia and respiratory distress syndrome were documented.

Results

There were a greater number of total doses of palivizumab given in the 2013-2014 RSV season than the 2014-2015 RSV season (63 doses vs. 25 doses) suggesting that overall prescribing for palivizumab decreased after implementation of the 2014 AAP guidelines. The percentage of doses given per AAP guidelines significantly decreased from the 2013-2014 RSV season to the 2014-2015 RSV season (86% vs. 60%). Two out of ten palivizumab doses given in the 2014-2015 RSV season did not meet either the 2010 or the 2014 AAP guidelines.

Conclusion

Prescribers followed the previous 2010 AAP guidelines more often than the updated 2014 AAP guidelines when utilizing palivizumab in neonates. This may be due to lack of familiarity with the new AAP guidelines or concern that the updated AAP guidelines are too stringent. More research is needed to review patient outcomes, such as RSV diagnosis, re-admissions, and administration of follow-up doses of palivizumab.

**Symptomatic constitution of Finnegan scores for infants born in Cabell County,
West Virginia and treated for neonatal abstinence syndrome (NAS)**

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Background

Neonates exposed in-utero to opioids and cannabinoids can experience withdrawal symptoms after birth, a condition termed Neonatal Abstinence Syndrome (NAS). The Finnegan Scoring System quantifies the presentation of NAS-related symptoms, with higher scores correlating to more numerous or intense symptoms.

Hypothesis

This study assessed the symptomatic constitution of Finnegan Scores recorded within the first 168 hours of life for neonates born at CHH and treated for NAS.

Methods

Data was obtained from patient charts at CHH via a standardized survey built using Qualtrics Survey Software, provided for by Marshall University. Finnegan scores were collected, with the cutoff being 168 hours after time of birth (TOB). Patients were included if they were born at CHH between 1/1/2015 and 12/31/2015 after 28 weeks gestation and were diagnosed and/or treated for NAS with methadone. Patients were excluded if they lacked the minimum demographic and substance exposure information or were transferred or discharged within 168 hours after TOB.

Results

Data from 62 patients included 3189 Finnegan scores and 16041 symptoms. The mean score was 8.02, with a median of 5 symptoms per score. 66.4% of symptoms involved the CNS, with "increased muscle tone" (94.7% of scores), "mottling" (84.7%), and "hyperactive moro reflex," (47.9%) being common. 89.7% included tremors, with a mean value of 2.06 (range 0-4). 22.0% of symptoms involved the ANS, with "nasal stuffiness" (30.5%) and "fever" (24.6%) being common. 12.7% of symptoms involved the gastrointestinal system, with "excessive sucking" (27.4%) and "diarrhea" (17.4%) being common.

Conclusion

Finnegan Scores averaged 8.02 and consistently included "increased muscle tone" (94.7%), "mottling" (87.4%), and tremors (89.7%). However, multiple factors affect symptom presentation, including nonpharmacologic care, time to pharmacologic treatment initiation, neonate gender, and in-utero substance exposure. Differences in symptom presentation must be determined in larger retrospective analyses.

The Frequency of Inappropriate Use of Prasugrel in Patients Post percutaneous coronary intervention (PCI). Single Center Study

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Background

Prasugrel was approved in 2009 for use in patients with acute coronary syndromes undergoing percutaneous coronary intervention (PCI). It offers more consistent, faster platelet inhibition and has superior anti-ischemic efficacy at the cost of a higher risk of bleeding compared with clopidogrel.

Hypothesis

Our research aims to assess the frequency of inappropriately used prasugrel and provide solutions .

Methods

In this retrospective study we assessed the pattern of prasugrel use among 937 patients who underwent percutaneous coronary intervention and were discharged alive from July 2014 to July 2015 at a university tertiary medical. We defined the inappropriate use of prasugrel as use in patients who had a history of cerebrovascular disease (CVA), weighed <60 kg, or were aged =75 years old.

Results

Prasugrel was prescribed to 12.9% (n=121) of patients who underwent PCI at discharge. Among patients prescribed prasugrel, 42.1% (n=51/121) presented with acute coronary syndrome (NSTEMI-ACS or STEMI), while 57.8% (n=70/121) of patients received prasugrel for indications other than acute coronary syndromes. One or more known contraindications to the drug were present in 19.8% of patients discharged on this medication. Of those patients 5% had history of CVA, 11.5% were aged =75 year old and 3.3% weighed less than 60kg.

At the end of the study we evaluated the pre-procedure/catheterization. We found that the age and weight are not mentioned there, so we added 3 boxes in addition to the already existed CVA box. These three boxes are age, weight and a box saying no Prasugrel. So if the patient has any of these boxes marked then the no prasugrel box will be marked and the patient will not be discharged on prasugrel.

Conclusion

Prasugrel use in patients with known contraindications is not uncommon, but according to our study it's been used inappropriately more frequently in our hospital when compared to literature data.

THE IMPACT OF OBESITY ON PATIENTS WITH SEVERE INJURIES AT A GLOBAL, NATIONAL AND STATE LEVEL: 1990-2015

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Background

Obesity is a risk factor for developing comorbidities such as coronary artery disease, stroke, and cancer. Nevertheless, it remains uncertain if obesity leads to an increased mortality rate in patients with traumatic injuries.

Hypothesis

The aim of this study is to evaluate the effect of BMI on the rate of mortality, years of life lost (YLL), years lived with disability (YLDs) and disability-adjusted life years (DALYs) in trauma patients on a global, national (USA), and state level (WV).

Methods

Data was used from all-cause mortality by age, sex, geography, and year using a honed analytical approach originally developed for the Global Burden of Disease (GBD) Collaborative 2013 and 2010. Number of incidence, YLL, YLD and DALYs were gathered and analyzed against BMI of patients for years 1990-2015. Six modeling approaches were used to assess cause-specific mortality, with the Cause of Death Ensemble Model (CODEm) generating estimates for the vast majority of causes.

Results

The mortality incidence from traumatic blunt injuries was 1.55%, 1.63%, 1.71%, 1.69% in 1990, 2000, 2010 and 2015, an increase of 0.14%. The increase in mortality obeyed mainly to falls (28.41% in the world, 97.52% in USA, and 82.55% increase in WV). The incidence of obesity has globally increase from 29%, 32%, 34%, 36.5% in 1990, 2000, 2010 and 2015 respectively, an increase of 7.5%. A linear correlation between BMI and mortality was observed for subjects with blunt trauma. Furthermore, the mortality of obese patients suffering falls has increased from 0.24 to 0.41% for the world, 0.33 to 0.75% for the USA and 0.36 to 0.68% for WV in 1990 to 2015. Similar correlation was noted between BMI and YLL even after adjustment (DALY's).

Conclusion

Obese patients had a significantly higher incidence of blunt trauma, and their injuries are associated with a higher incidence of mortality.

The Incidence and Impact of Adverse Childhood Experience (ACEs) in Children and Adolescents with ADHD: A Controlled Study

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Background

ACEs such as physical or sexual abuse and exposure to violence documented in adult retrospective studies are associated with an increased risk for the development of both physical and mental health disorders including ADHD. There is no data on the incidence or impact of parent-reported ACEs on children currently diagnosed and treated for ADHD compared to a control population.

Hypothesis

There

Methods

From August through November of 2016 the parent form of the Life Incidence of Traumatic Events Survey measuring the occurrence and impact of 17 adverse experiences was given to all parents of children seen at ADHD Center follow-up visits. All patients had been diagnosed and treated for ADHD by one behavioral pediatrician following current American Academy of Pediatrics guidelines. Parents of children without ADHD were also surveyed during routine well-child visits at a separate university primary care pediatric office.

Results

The ADHD (n=105) and control (n=39) groups were comparable in age, sex and health insurance status. The most common ACEs in both groups were: death in the family (61%), family member in hospital (60%) and parents separated or divorced (43%). There were no significant differences between the two groups in types of ACEs experienced or in severity of effect measured currently or at the time of the event. There was a statistically significant difference between the mean number of events per patient (ADHD 3.70+19.07 vs. control 2.59+5.71) and the percentage of patients with 3 or more ACEs (ADHD 74.3% vs. control 46.15%).

Conclusion

Although both the type and severity of ACEs experienced are similar, pediatric patients with ADHD have a higher number of parent-reported ACEs when compared to a control population without ADHD.

The Price of Diarrhea

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Background

Clostridium Difficile (C-Diff) infection is a known cause of mortality and morbidity in hospitals, adding \$4.8 billion a year to the health care burden. Testing for this organism is governed by guidelines highlighted in the Infectious Diseases Society of America (IDSA). According to the IDSA guidelines, a clinically significant diarrhea is defined "as passage of 3 or more unformed stools in 24 or fewer consecutive hours".

Hypothesis

Is there C-diff over-testing at Marshall? What's the financial impact?

Methods

A Prospective study performed at a university tertiary medical center. Names of patients for whom C-diff lab test was ordered were obtained from the lab daily for one month. The patients were then interviewed by one of the team members to determine the exact number of bowel movements and consistency for 24 hours preceding the test.

Results

A total of 53 C-Diff DNA amplified tests were performed. Of those 53 cases, only cases 16 (30%) met the guidelines for collection while 37 cases (70%) did not meet these guidelines. Of the 16 cases that met the guidelines, only 5 cases (31%) came back positive for C-Diff. Of the 37 cases that didn't meet the guidelines, 13 cases (35%) didn't undergo any testing as patients were unable to provide a stool sample. The other 24 cases (65%) were tested for C-diff and all were found to be negative. The price of one test amplified is \$274 and the price of the rapid test is \$72.5. Based on these figures, the total cost of the negative 24 tests is estimated to be 6,576. A total of 13 rapid tests were done with an estimated cost of \$943. Total cost of the tests was \$7,519. Over the span of a year \$90,228.

Conclusion

Testing for C-Diff infection in patients with no clinically significant diarrhea has an extremely low yield.

The Reliability of Medial Elbow Joint Space Width Measurements: Using Sonography

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Background

Injuries to the Ulnar Collateral Ligament of the elbow are a common occurrence in overhead throwing athletes. Ultrasound imaging can be used to determine the width of the medial joint space. The reliability of these measurements needs to be assessed.

Hypothesis

We hypothesized that the medial joint space width measurements can be made reliably.

Methods

Seven participants (142 ± 10.9 cm, 48.0 ± 10.4 Kg) volunteered for this study. Ultrasound images of the participant's non-dominant left elbow were collected. Images were collected during 3 clinical tests of medial elbow stability; the valgus stress test, a weighted valgus stress test and the milking maneuver. The width of the medial joint space was measured on images collected in unstressed and stressed conditions. All participants returned at least 1 hour later for repeat testing. The reliability of the measures of width of the medial elbow joint space width was determined using intraclass coefficient (ICC), standard error of measure (SEM), and minimal detectable change (MDC).

Results

The ICC values for the unstressed position ranged from .864- .983, and for the stressed condition ranged .939- .961. The average SEM was .119 mm for the unstressed position was .127 mm. The average MDC for the unstressed position was .169 mm and for the stressed position 0.179 mm. The mean measurement of the medial joint space was 2.58 mm in the unstressed position and 3.24 mm for the stressed position, leaving an average difference of .661 mm

Conclusion

All of the ICC values show good to excellent reliability. Application of diagnostic ultrasound can be used in a clinical setting to measure the width of the medial joint space. This study was limited to participants without elbow injury, it is unclear how the presence of UCL injury would affect the reliability of the measures of the width of the medial joint space.

TRENDS ON PANCREATIC CANCER AND ASSOCIATED RISK FACTOR AT THE GLOBAL, NATIONAL AND STATE LEVEL: 1990-2015.

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Background

The incidence of pancreatic cancer (PCa) is on the rise with significant geographic variation, suggesting a role for socio-cultural and environmental variables as risk factors. Identification of such variables is of importance for the prevention and screening of high-risk populations for early detection.

Hypothesis

Behavioral, dietary and metabolic characteristics are associated with increased risk of PCa.

Methods

Data collected by the Institute of Human Metrics and Evaluation was used in the present study. Data input come from two major pathways: mortality data, and cancer registry incidence data transformed to mortality estimates. Mortality data from vital registration systems, verbal autopsies, and other sources like disease surveillance records were processed and added to a cause of death (CoD) database. The combined data were used as input for the ensemble modeling approach "CODEm."

Results

The incidence of PCa was 213,357, 271,800, 362,597 and 425,666 in 1990, 2000, 2010 and 2015, respectively at a global level, an increase of 51.85%. The incidence of pancreatic cancer in USA and WV during the same time interval has an increase of 55.8% and 78.56%, respectively. Among all ages, the percentage of deaths from PCa increased by 60.41% globally, 28.73% nationally and 18.95% in WV during the same period. A geographical variation was observed with higher incidences in Western Europe, the US and Japan. The incidence of PCa increases in high-income regions and it correlates with the socio-demographic index score (SEIS). Other global risk factors include elevated BMI and smoking. Similar factors plus diets high in sugar-sweetened beverages (DHSSB) were noted in USA and WV.

Conclusion

Pancreatic cancer is increasing at the global, national and state level. Geographical variations are explained, at least in part by high SEIS, obesity, smoking and DHSSB. Behavioral, dietary, metabolic and population characteristics should be considered as risk factors in the development of PCa screening policies.

Utilization of Appalachian Clinical and Translational Science Institute Data Warehouse to more accurately predict disease processes important for central Appalachia.

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Background

Metabolic syndrome (MetS) is a significant risk factor for multiple morbidities such as heart attack, stroke, diabetes and some cancers (e.g. liver cancer in men and endometrial in women). MetS also increases risk of all causes of cardiovascular disease and mortality. Obesity is central to MetS and West Virginians have the second highest rate of obesity in the U.S. Thus, it is important to accurately diagnose MetS in our central Appalachian population.

Hypothesis

ACTSI Data Warehouse (ACTSI-DW) can be utilized to more accurately determine the number of patients with MetS.

Methods

We utilized the ACTSI-DW to more accurately determine the number of patients with possible MetS at Marshall Health/Cabell Huntington Hospital patient population. ACTSI-DW was queried for MetS ICDcodes (277.1 or E88.81), for criteria necessary (e.g. BMI, hypertension, dyslipidemia, hyperglycemia) for the diagnosis of MetS recommended by different agencies (World Health Organization (WHO), National Cholesterol Education Program (NCEP), European Group for the Study of Insulin Resistance (EGIR), American Council on Exercise (ACE)) over the last 6.5 years.

Results

By ICD code alone, only 232 patients were diagnosed with Met S in the last 6.5 years. However, based on criteria by each of the following agencies, we identified MetS as follows NCEP = 13,833; WHO = 5,131; EGIR = 20,182; and ACE = 23,110 unique patients during the same 6.5 years.

Conclusion

Conclusions: The ACTSI-DW may be used to specifically identify characteristics of a disease entity more accurately than ICD codes alone. This has potential implication for better diagnosis, and thus, provision of proactive preventative and concurrent care for these patients.

Utilization of radionuclide myocardial perfusion imaging for the evaluation of chest pain in a population of the state of West Virginia: assessment with the ACCF/AHA/ASE/ASNC/HFSA/HRS/SCAI/SCCT/SCMR/STS 2013 Multimodality Appropriate Use Criteria for the Detection and Risk Assessment of Stable Ischemic Heart Disease

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Department of Internal Medicine, Joan C Edwards School of Medicine - Marshall University.

Background

Radionuclide myocardial perfusion imaging (RMPI) is ubiquitous in diagnosing coronary artery disease (CAD), hence cost-effective use is extremely important.

Hypothesis

We expected to prove that percentage of appropriate RMPs in our study approximates the national average.

Methods

This was a retrospective study where we reviewed the medical records of all the CRI studies ordered by cardiologists and non-cardiologists and performed from January 1, 2014 through March 31, 2014 at Byrd Clinical Center for the evaluation of individuals presenting with non acute chest pain or ischemic equivalent complaints. All data was numerically coded. All analysis was performed by means of SPSS with a 95% Confidence Interval and a $p < 0.05$ level. Differences in demographic and other characterization variables were expressed on absolute numbers and corresponding percentages of the total sample. Description of the studies as Appropriate (A), May be appropriate (M) or Rarely appropriate (R); and differences in specialty/academic status of ordering provider were also expressed on absolute numbers and corresponding percentages of the total sample.

Results

Patients' mean age was 61 ± 13 years, 53 % were women. Rates of Appropriate, May-be-appropriate, Rarely-appropriate and unclassified studies were 91 %, 0 %, 5.4% and 3.6%, respectively. Appropriateness rate compared with literature reviewed. Female, young patients with low pretest probability of CAD were more likely to have Rarely appropriate than Appropriate studies (87.5% vs. 49%, $p=0.034$; age 44.5 ± 7.5 vs. 62.2 ± 12.6 , $p=0.0001$; respectively) coinciding with literature reviewed.

Conclusion

Appropriateness rate in our study compares to the national/international average. Most Rarely appropriate studies were observed in younger, female patients with low probability of CAD which highlights an area of improvement when selecting appropriate diagnostic tools in this particular population. Additional research is needed in the general population since our patients come from an outpatient setting which limits sample representativeness.

Validation of Survey Instrument for E-Cigarettes for Smoking Prevention and Cessation Study

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Background

In order to assess the results of any study, the study instrument must first be thoroughly examined. Our study uses a survey to investigate the use of e-cigarettes among college students for the prevention and/or cessation of traditional cigarette smoking. Before administering the survey, we performed an extensive validation process, addressing both validity and reliability.

Hypothesis

We hypothesize that our survey instrument is both valid and reliable.

Methods

Validation of the instrument began with Face Validity (FV), which is a content and structural examination, followed by Content Validity (ContentV), which involves expert feedback about the content and structure. Finally, we performed Construct Validity (ConstructV) through a Principal Components Analysis (PCA) using the IBM SPSS Statistics software (SPSS).

Stability Reliability (SR) was performed using the Test-Retest method, in which the survey was administered to ten people, and then again given to the same ten people after two weeks. SPSS was used to calculate Pearson's Coefficient (PC) for each item. Internal Consistency Reliability (ICR) was evaluated by using SPSS to calculate Cronbach's Alpha for the entire survey, followed by for each component from the PCA.

Results

Comments and feedback from FV and ContentV were addressed in the survey instrument. ConstructV mathematically identified four different components, which were matched to the components that the instruments was designed to address. After performing ICR for the entire survey, Cronbach's Alpha was 0.627. However, after deletion of the item with the most improvement, Cronbach's Alpha became 0.800. For SR results, out of 34 items, there were 11 with $PC > 0.7$ that were significant. Additionally, there were 2 with $PC < 0.7$ that were not significant, which were then deleted. Finally, there were 21 items that could not be computed, which was due to the item structure.

Conclusion

The survey instrument examining e-cigarette use was successfully validated using FV, ContentV, ConstructV, SR, and ICR.

Validation of survey instrument for Palpitations in night shift working nurses study

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Background

Assessment instruments must be both reliable and valid for study results to be credible. We are conducting a study to determine if there is any association between night shift working and palpitations. As a part of the study, we also carried out validation of the survey instrument.

Hypothesis

We hypothesize that our survey instrument is both valid and reliable.

Methods

For this instrument, we assessed Face Validity and Content Validity. We assessed Face validity by reviewing the structure and the content of the instrument, We then assessed Content Validity by having experts review the content and structure of the instrument.

Stability Reliability was assessed using Test Re-test Method; we asked the nurses working at the Cabell Huntington Hospital's emergency department to fill out the survey questionnaire on 2 separate occasions. We then calculated the Pearson's coefficient for each item in the questionnaire. Internal Consistency Reliability was assessed using Cronbach's Alpha. Also we determined the change in Cronbach's alpha if each item were deleted to further improve the Internal Consistency Reliability of the instrument.

Results

The instrument had a total of 32 items. Changes were made based on comments from Face and Content Validity assessment. The items with significant Pearson's coefficients ranged from 0.94 to 1. Six of the items had non-significant Pearson's correlations, these items were reviewed and modified. 11 of the items could not be computed due to the structure of the item. For Internal Consistency Reliability, the initial Cronbach's Alpha was calculated to be 0.636. After the item with the most improvement in Cronbach's Alpha was deleted, the resultant Cronbach's Alpha was 0.721.

Conclusion

The survey instrument for palpitations in night shift working Nurses study has been validated using Face and Content Validity, Stability Reliability and Internal consistency Reliability.

Withdrawal Outcomes Differ in Patients with Neonatal Abstinence Syndrome from Poly-drug Exposure

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Background

At Cabell Huntington Hospital (CHH) 14% of neonates are at significant risk for developing Neonatal Abstinence Syndrome (NAS), due to withdrawal from in utero exposure of addictive substances. Infants suffering from NAS require opiate weaning therapy and require additional medications.

Hypothesis

This study's hypothesis is that the polydrug exposure with opioids and other substances of abuse will effect NAS outcomes, including hospital length of stay (LOS), withdrawal severity, and therapy protocol.

Methods

A chart review was performed on NAS patients at CHH between January and June of 2014. Drug exposure was determined from reported maternal drugs and umbilical cord blood drug screens. Neonatal weight, Gestational age, LOS, Finnegan scores, and the use of Clonidine, were recorded.

Results

Ninety neonates displayed NAS during the study period, 27% had a single opioid drug exposure, while the other 73% were exposed to poly-drug combinations. Average LOS for Opioid exposure alone was 27.89 (\pm 11.61 days), and was significantly different dependent on type and number of opioid exposures ($p=0.007$). Poly-drug exposure significantly affected LOS dependent on drug combinations ($p=0.002$). For neonates exposed only to opioids, buprenorphine exposure resulted in the highest LOS (31.27 ± 6.56 days) and Finnegan scores (7.63 ± 0.49), and Morphine exposure resulted in the lowest LOS (6.33 ± 1.53 days) and Finnegan score average (6.04 ± 0.23). In conjunction with Opioids, Cannabis use resulted in reductions in LOS (27.8 ± 6.7 days) and adjunctive Clonidine administration (14.3%), while Cocaine had increased LOS (51.7 ± 8.08 days) and required the most Clonidine therapy (66.7%).

Conclusion

Poly-abuse significantly impacts neonate LOS, Finnegan scores, and adjunct Clonidine therapy. Cocaine in conjunction with opioids resulted in the worst outcomes, in contrast, Cannabis exposure with Opioids improved short term outcomes. In opioid only exposed neonates, Morphine showed better outcomes than Buprenorphine or Methadone.



