



*The Department of Internal Medicine
Brody School of Medicine
East Carolina University*

Presents the
**30th Annual
Yash P. Kataria
Internal Medicine
Research Day
April 13, 2016**



30th Annual Yash P. Kataria Internal Medicine Research Day 2016

***Wednesday, April 13th, 2016
9:30 AM – 4:00 PM
East Carolina Heart Institute***

Paul Bolin, Jr., MD
*Professor and Chair
Department of Internal Medicine*

Research Day Advisory Committee
*Badih Kabchi, MD, Co-Chair
Arjun Mohan, MD Co-Chair
Cindy Kukoly
Cathy Munson
Nan Leffler
Bobbie Harris*



The most exciting phrase to hear in science, the one that heralds new discoveries, is not 'Eureka!' but 'That's funny...' Isaac Asimov



Department of Internal Medicine

30th Annual Yash P. Kataria Internal Medicine Research Day

Wednesday, April 13th, 2016

9:00am	Refreshments - ECHI Atrium & Conference Room	Poster Presentations available for viewing
9:30am	Welcome - ECHI Auditorium	Paul Bolin, Jr., MD Department of Internal Medicine
9:35am	Administrative Comments - ECHI Auditorium	Arjun Mohan, MD and Badih Kabchi, MD Co-Chairs Research Day Committee

First Oral Session, ECHI Auditorium

Moderator: Arjun Mohan, MD

9:45am	OP1	SIRS WITH IMMUNE CHECKPOINT INHIBITORS	<u>N Sharma</u> , G Stroud, PR Walker, C Cherry, S Cherukuri, S Addepalli
10:00am	OP2	OUTCOMES IN PATIENTS WITH STAGE III NON-SMALL CELL LUNG CANCER TREATED WITH CISPLATIN AND IRINOTECAN WITH CONCURRENT THORACIC RADIOTHERAPY: A MULTI-DISCIPLINARY THORACIC ONCOLOGY EXPERIENCE AT EAST CAROLINA UNIVERSITY.	<u>J Hildebrand</u> , P Walker
10:15am	OP3	ACIDOTIC ACTIVATION OF GPR4 STIMULATES ATF3 EXPRESSION WHICH ACTS AS A NEGATIVE REGULATOR OF INFLAMMATION IN HUMAN UMBILICAL VEIN ENDOTHELIAL CELLS	<u>EA Krewson</u> , L Dong, Z Li, LV Yang
10:30am	OP4	ANALYSIS OF RECIDIVISTIC ADMISSIONS FOR DIABETIC KETOACIDOSIS AT VIDANT MEDICAL CENTER	<u>S Ahmed</u> , S Hardee, RJ Tanenberg
10:45am	OP5	TDAG8 STIMULATES NEGATIVE SELECTION AND ACTS AS A TUMOR SUPPRESSOR IN HEMATOLOGIC MALIGNANCIES	<u>CR Justus</u> , EJ Sanderlin, and LV Yang

11:00 am

Keynote Address: ECHI Auditorium

“Novel Diuretic Regimens: From Gene to Mouse to Human”

Manoocher Soleimani, MD
James Heady Professor of Medicine
Associate Chair for Research
Department of Medicine, Division of Nephrology and Hypertension
University of Cincinnati

12:00pm

***ECHI Conference Room
Lunch followed by
Poster Session (12:00 – 1:45pm)***

***Second Oral Session, ECHI Auditorium
Moderator: Darla Liles, MD***

- | | | | |
|---------|-------------|---|---|
| 1:45pm | OP6 | PLASMA NOREPINEPHRINE AND DOPAMINE LEVELS ARE INDEPENDENT PREDICTORS OF RISK FOR ATRIAL FIBRILLATION FOLLOWING CARDIAC SURGERY | <u>P Gudimella</u> , CN Beatty, JT Efird, P Gudimella, KA Thayne, AP Kypson, EJ Anderson |
| 2:00pm | OP7 | THE EFFICACY OF SGLT-2 INHIBITORS COMPARED TO DPP4 INHIBITORS AS ADD-ON THERAPY TO METFORMIN: A META-ANALYSIS | <u>BM Mishriky</u> DM Cummings, RJ Tanenberg |
| 2:15pm | OP8 | PULMONARY REHABILITATION: A RETROSPECTIVE STUDY IN EASTERN NORTH CAROLINA | <u>SN Chalise</u> , H Shaheen, MZ Rizwan, K O'Brien, R Shaw |
| 2:30pm | OP9 | THE pH-SENSOR GPR4 POTENTIATES INTESTINAL INFLAMMATION IN A MOUSE MODEL OF INFLAMMATORY BOWEL DISEASE | <u>EJ Sanderlin</u> , K Lertpiriyapong, NR Leffler, Q Cai, H Hong, J Fox, V Bakthavatchalu, JZ Oswald, CR Justus, EA Krewson, D O'Rourke, LV Yang |
| 2:45pm | OP10 | NEOADJUVANT METRONOMIC CHEMOTHERAPY IN TRIPLE NEGATIVE BREAST CANCER (NCT00542191): UPDATED RESULTS FROM A PHASE II TRIAL | <u>J Hildebrand</u> , P Walker |
| 3:00pm | OP11 | BASELINE PATIENT CHARACTERISTICS FOR INSYNC: A PHASE II TRIAL REGARDING THE EFFECT OF COMPREHENSIVE SYMPTOM MANAGEMENT SERVICES ON INFLAMMATION AND SURVIVAL IN METASTATIC LUNG CANCER | <u>CRG Stroud</u> , BS Brown, P Walker |
| 3:15pm | OP12 | CAN PROSPECTIVE AUDIT AND FEEDBACK DECREASE INAPPROPRIATE ANTIBIOTIC USE IN LONG TERM CARE FACILITIES? | <u>MS Ashraf</u> , K Shah, M Dhillon, H Nguyen, A Abubaker, A Stang, P Cook |
| 3:30 pm | OP13 | INTERMITTENT HIGH DOSE INTRAVENOUS IMMUNOGLOBULIN AS TREATMENT FOR DONOR SPECIFIC ANTIBODIES IN RENAL TRANSPLANT RECIPIENTS | <u>P Bolin</u> , K Parker, F Rana, W Bryant, P Jawa and R Harland |

3:45pm

***Closing Remarks and Award Presentations
Paul Bolin, Jr., MD, Chair Department of Internal Medicine***

*Poster Presentations, ECHI Conference Room
Research*

- PR1** **ROLE OF PUF-8/PUMILIO AND CSR-1/ARGONAUTE IN CELL FATE DECISION OF CAENORHABDITIS ELEGANS GERMLINE** DS Yoon, MH Lee
- PR2** **CELLULAR LOCALIZATION OF NRF2 DETERMINES THE SELF-RENEWAL AND OSTEOGENIC DIFFERENTIATION POTENTIAL OF HUMAN MESENCHYMAL STEM CELLS VIA P53-SIRT1 AXIS** DS Yoon, Y Choi, MH Lee, JW Lee
- PR3** **THE ROLE OF PUF-9/PUF RNA-BINDING PROTEIN IN CAENORHABDITIS ELEGANS** RP Parekh, MH Lee
- PR4** **NOTCH SIGNALING MEDIATES DRUG RESISTANCE IN COLORECTAL CANCER CELLS VIA EFFECTS ON DNA REPAIR PROTEINS** DC George, AG Clark, A Khan, DA Weidner, G Sigounas
- PR5** **INHIBITION OF NOTCH-3 DECREASES NOTCH-1-INDUCED TUMORIGENESIS OF COLORECTAL CANCER** KE Vinson, AG Clark, A Khan, G Sigounas
- PR6** **BK VIRUS STIMULATES HUMAN PROXIMAL KIDNEY TUBULE CELLS TO UNDERGO MULTIPLE ROUNDS OF DNA SYNTHESIS.** JG Arthur, TD Friedrich, JM Lehman
- PR7** **EXPOSURE TO A MYCOBACTERIAL ANTIGEN EXACERBATES INFLAMMATION AND FIBROSIS IN A MULTI-WALL CARBON NANOTUBE MWCNT MODEL OF PULMONARY GRANULOMATOUS DISEASE** A Malur, BP Barna, M McPeck, L Dobbs, CJ Wingard, MJ Thomassen
- PR8** **ELEVATED MICRORNA-33 IN CARBON NANOTUBE-MEDIATED CHROINC GRANULOMATOUS DISEASE AND HUMAN SARCOIDOSIS PATIENTS IS ASSOCIATED WITH ALVEOLAR MACROPHAGE LIPID TRANSPORTER DYSFUNCTION** M McPeck, A Malur, M Fessler, C Wingard, BP Barna, MJ Thomassen
- PR9** **PREDICTION OF AIRWAY OBSTRUCTION BASED UPON OBSERVATIONS OF THE UPPER AIRWAY DURING UPPER ENDOSCOPY** G Harvin , E Ali, A Raina, W Leland , S Abid, Z Vahora, H Movahed , S Kachru, R Tee
- PR10** **PLASMA EXCHANGE TAPER FOR ACQUIRED TTP IS PROTECTIVE AGAINST RECURRENCE AT BOTH 30 DAYS AND 6 MONTHS: A RETROSPECTIVE STUDY FROM 2 ACADEMIC MEDICAL CENTERS** P Chae, J Raval, Y Park, D Liles, M Mazepa
- PR11** **ANALYSIS OF MORTALITY FOLLOWING CURATIVE THERAPY FOR HEAD AND NECK CANCER** M Navaid, P Lepera, J Rosenman
- PR12** **HIGH ADHERENCE TO ORAL MEDICATIONS AMONG HEMATOLOGY PATIENTS IN A RURAL COMMUNITY-BASED HOSPITAL NETWORK** DK Liles, CS Lea, TN Moore, B Dangott, L Stewart, C Passwater, C Knupp
- PR13** **GENETIC RISK ASSESSMENT FOR BREAST CANCER: IMPACT OF RACE AND SOCIOECONOMIC STATUS.** N Lawing, J Hildebrand, M Muzaffar
- PR14** **IDENTIFYING HIGHLY ACTIVE ANTIRETROVIRAL THERAPY RELATED MEDICATION ERRORS AT VIDANT MEDICAL CENTER** M Mehta, N Nicolsen

PR15	DETECTION OF LIVESTOCK-ASSOCIATED STRAINS OF METHICILLIN-RESISTANT <i>STAPHYLOCOCCUS AUREUS</i> AMONG NASAL ISOLATES OF PATIENTS IN EASTERN NORTH CAROLINA	<u>KL Augustino</u> , BJ Feingold, P Udani, KM Ramsey
PR16	REMOTE ANTIMICROBIAL STEWARDSHIP IN COMMUNITY HOSPITALS	<u>Z Wood</u> , N Nicolsen, N Allen, P Cook
PR17	PROPOSED MODEL FOR THE CARE OF HOSPITALIZED PERITONEAL DIALYSIS PATIENTS	CR Christiano, MI Hames, P Jawa, <u>PJ Hughes</u> , MH Locklear
PR18	QUANTIFYING THE GENDER REIMBURSEMENT GAP IN NEPHROLOGY	<u>S Ali</u> , X Fang, P Jawa, TP Desai
PR19	AN OBSERVATIONAL ANALYSIS OF OFFICE BASED MICROSCOPE	<u>K Liner</u> , C Phillips
PR20	GLIMEPIRIDE VERSUS GLIPIZIDE AS ADD-ON THERAPY TO METFORMIN IN TYPE 2 DIABETES MELLITUS. A POST-HOC META-ANALYSIS.	<u>BM Mishriky</u> , DM Cummings, RJ Tanenberg

Poster Presentations, ECHI Conference Room
Vignette

PV1	LOSS OF VISION FOLLOWING TRAUMA. CAN WE SEE IT WHEN PATIENTS CANNOT SEE?	<u>BM Mishriky</u> , S Pancholi, AK Rao
PV2	RHINO CEREBRAL MUCORMYCOSIS IN PATIENTS WITH DIABETIC KETOACIDOSIS –A DIAGNOSIS WITH HIGH MORTALITY	S Naseer, RJ Tanenberg S Meharavaran, L Dobbs
PV3	REMISSION OF TYPE B INSULIN RESISTANCE ACHIEVED WITH IMMUNOSUPPRESSIVE THERAPY	J Giordano, SF Lin, M Javaid, <u>MS Kalia-Reynolds</u> , BE Ramirez, E Treadwell, AJ Drake, RJ Tanenberg, C Houston, FJ Cook
PV4	EUGLYCEMIC DIABETIC KETOACIDOSIS AS A COMPLICATION OF SODIUM-GLUCOSE COTRANSPORT(SGLT-2) INHIBITORS USE IN DIABETIC PATIENTS	<u>SF Awadallah</u> , S Wasim, P Kaur, RJ. Tanenberg
PV5	THYROTOXIC PERIODIC PARALYSIS: CHALLENGING DIAGNOSIS IN A CASE WITH MIXED ETHNICITY	<u>MR Azad</u> , FJ Cook, S Boyapati
PV6	PANHYPOPITUITARISM ASSOCIATED WITH A GIANT PARASELLAR CAROTID ARTERY ANEURYSM	<u>FE Bautista Vitiello</u> , AJ Drake III, FJ Cook
PV7	X-LINKED HYPOPHOSPHATEMIA PRESENTING AS SEVERE HYPOPHOSPHATEMIA IN ADULthood	<u>BF Ramirez</u> , S Mumm, FJ Cook, MP Whyte
PV8	PANCREATIC NEUROENDOCRINE TUMOR PRESENTING WITH MINERALOCORTICOID EXCESS	<u>BF Ramirez</u> , A Raina, S Patel, E Zervos, AJ Drake
PV9	INSULIN EDEMA AND TREATMENT-INDUCED NEUROPATHY IN A TYPE 1 DIABETIC WITH BODY DYSMORPHIC DISORDER	<u>K Sheth</u> , C Houston
PV10	ESOPHAGEAL CROHN'S DISEASE	S Durrett, <u>G Kasarala</u> , G Harvin
PV11	HIDRADENITIS SUPPURATIVA WITH ADALIMUMAB: FRIEND AND FOE	G Harvin, <u>G Kasarala</u>
PV12	BRONCOGENIC CYST MASQUERADING AS COPD EXACERBATION	<u>Y Mao</u> , N Gollol-Raju, S Sarwar
PV13	MARIJUANA: CARDIOVASCULAR IMPLICATIONS OF RECENT LEGAL CHANGES	<u>LW Njoroge</u> , GA Koromia, JR Powell
PV14	ABNORMAL LIVER ENZYMES IN A MALE PATIENT WITH FRAGILE X: A GUIDE FOR PRIMARY CARE PHYSICIANS	<u>N Jampala</u> , B Mishriky, S Pancholi, K Sheth
PV15	GEMELLA SPECIES BACTEREMIA AND STROKE IN AN ELDERLY PATIENT WITH RESPIRATORY TRACT INFECTION: A CASE REPORT	S Jayananda, <u>N Gollol-Raju</u> , N Fadul
PV16	AN UNCOMMON CASE OF UPPER GASTROINTESTINAL BLEED FROM GASTRIC MALT LYMPHOMA: A CASE REPORT	<u>S Jayananda</u> , B Simpson, N Gollol-Raju, W Leland

PV17	PSEUDOMEMBRANOUS COLITIS-NOT NECESSARILY CLOSTRIDIUM DIFFICILE INFECTION! A CASE REPORT	<u>S Jayananda</u> , N Gollol-Raju, G Harvin
PV18	RENAL MASS AND BILATERAL RENAL VEIN THROMBOSIS IN A YOUNG GIRL	<u>S Wasim</u> , S Awadallah, P Kaur, JR Powell
PV19	RARE FUNGAL INFECTION IN A CANCER PATIENT AND ITS TREATMENT	<u>S Wasim</u> , C Hite, L Zha, A Prashanti
PV20	DOC, MY EYES ARE RED, WHAT IS WRONG WITH ME	<u>B Dunn</u> , A Weil, S Liu,
PV21	IFOSFAMIDE INDUCED ACUTE INFLAMMATORY DEMYELINATING POLYRADICULONEUROPATHY	<u>D Feldman</u> , J McClain, P Atluri, M Muzaffar
PV22	HEMOPHAGOCYTIC LYMPHOHISTIOCYTOSIS IN AN ADULT: DIAGNOSTIC CHALLENGES	<u>R Pinnamaneni</u> , M Muzaffar, G Gagnon, D Liles, A Weil
PV23	DIFFUSE LARGE B CELL LYMPHOMA WITH TRISOMY 14	<u>A Hegde</u> , M Muzaffar
PV24	GRANULOMATOUS DISEASE MANIFESTING AS REFRACTORY HYPERCALCEMIA AFTER TYROSINE KINASE INHIBITOR (TKI) THERAPY	<u>N Sharma</u> , <u>PA Lepera</u> , JG Rosenman, PR Walker, G Stroud
PV25	METASTATIC INVOLVEMENT OF THE STOMACH BY BREAST CANCER: 2 CASES	<u>J Hildebrand</u> , M Muzaffar
PV26	RECOGNIZING A CASE OF MUIR-TORRE SYNDROME; A SUBTYPE OF LYNCH SYNDROME	J Turbeville, K Liner, <u>R Proctor</u> , W Burke, C Simons
PV27	TWO CASES OF DEMODEX FOLLICULITIS	<u>MM Ash</u> , AI Grossman, CM Phillips
PV28	TWO CASES OF OPHTHALMIC TRIGEMINAL TROPHIC SYNDROME	<u>MM Ash</u> , EL Stewart, CM Phillips
PV29	NON-MELANOMA SKIN CANCER IN SKIN OF COLOR: CASES OF MISTAKEN IDENTITY	<u>A Newsome</u> , J Subash, C Phillips
PV30	HYPERNATREMIA AFTER BARIATRIC SURGERY: NDI WITH UNKNOWN ETIOLOGY	<u>J Zhang</u> , I Owoyemi, R Obi, MJ Barchman, HL Lai
PV31	UNCOVERING SCLERODERMA RENAL CRISES MASKED AS END STAGE RENAL DISEASE	<u>S Sajadi</u> , R Sarsour, R Obi
PR32	IS THIS ORGANISM CAUSING MY SKIN INFECTION?	<u>D Lebron</u> , D Markham
PV33	ARDS AFTER A SINGLE ORAL DOSE OF ACETAZOLAMIDE	<u>A. Abubaker</u> , T Pancost, D Siraj
PV34	A RARE CASE OF A FUNGAL PACEMAKER INFECTION	<u>P Shah</u> , <u>A Stang</u> , N Fadul, D Siraj
PV35	PULMONARY CRYPTOCOCCOSIS IN A PATIENT WITH PULMONARY-RENAL SYNDROME, RECENTLY INITIATED ON CORTICOSTEROIDS.	<u>K Malik</u> , CJ Brown, ME Dauterive, BU Patel
PV36	SACCHAROMYCES CEREVISIAE EMPYEMA	<u>MG Al Janabi</u> , MS Dhillon, M Bowling
PV37	AXONAL VARIANT GUILLAIN-BARRÉ SYNDROME ASSOCIATED WITH NON-HODGKIN'S LYMPHOMA – A RARE CASE REPORT	<u>M Dhillon</u> , L Zha, H Nguyen, FJ Lodeserto

PV38	SEVERE ACUTE HEPATITIS DUE TO SERONEGATIVE AUTOIMMUNE HEPATITIS: A CASE REPORT	<u>B Patel</u> , S Jayananda, N Golloi-Raju W Leland
PV39	REFRACTORY HYPOXEMIA FROM INTRA-CARDIAC SHUNTING THROUGH PATENT FORAMEN OVALE	<u>B Patel</u> , P Singh, S Ogake, S Durrett, FJ Lodeserto
PV40	BORROWING A PAGE FROM THE PAST: USING AMINOPHYLLINE FOR AN ADULT WITH STATUS ASTHMATICUS	<u>F Houshmand</u> , J Stahl, H Nguyen, FJ Lodeserto
PV41	ALTERED WITH EXTREME AGITATION: 2 CASES OF POSTERIOR REVERSIBLE ENCEPHALOPATHY SYNDROME IN THE MEDICAL INTENSIVE CARE UNIT	<u>J Stahl</u> , F Houshmand, H Nguyen, FJ Lodeserto
PV42	AORTIC DISSECTION BY COITIS: A CASE REPORT	<u>IA Siddiqui</u> , E Levin, A Hidalgo
PV43	SIMULTANEOUS PULMONARY AND PARADOXICAL EMBOLI WITH IMPENDING PARADOXICAL EMBOLUS (IPDE); A RARE PRESENTATION	M Rizwan, S Chalise, M Al-Janabi, N Sultana, Z Rehman
PV44	A CASE OF SARCOIDOSIS PRESENTING WITH FOOT DROP	<u>A El-Bakush</u> , K Parikh, B Keleher, A Ismail, R Shaw



In 2008, the annual departmental research day program was dedicated and renamed the **Yash P. Kataria Internal Medicine Research Day** to honor the many contributions of Dr. Yash P. Kataria and to support the educational and research program in the Department of Internal Medicine at the Brody School of Medicine at ECU.

Dr. Kataria is Professor Emeritus of Medicine at BSOM and continues to contribute actively to the clinical, educational and research mission of the pulmonary and critical care division at BSOM. He was the first pulmonologist in eastern NC and helped to establish the pulmonary specialty at BSOM 30 years ago and has been an integral force since the inception of the medical school. Yash was the first division chief of pulmonary medicine at BSOM and successfully recruited and established a clinical and active laboratory research program. Yash was the section head of pulmonary at BSOM /PCMH from 1978-1995, Vice Chair of the Dept. of Medicine 1987-1992 and Interim Chair 1986-87. Yash is of course known regionally, nationally and internationally for his passion in translational research with a particular focus on sarcoidosis. He has authored over 70 publications, has received the Trudeau Award from the American Lung Association, Lifetime Achievement Award by the NC Thoracic Society, on many occasions been listed on the “Best Doctors” list, has been a reviewer and/or on editorial board for numerous specialty journals.

Over his 30 year career, he has cared for thousands of patients with sarcoidosis and he arguably has one of the largest sarcoid cohorts in the US. Yash is revered by his patients and families. Yash has literally trained hundreds of medical students and house staff and is cherished by them as a role model and outstanding teacher at the bedside and in clinics. Yash has been a fixture in the international sarcoid community and has contributed actively at a leadership level at ACCP, ATS and WASOG. Scientifically, Yash is perhaps best known for promulgating a paradigm shift in our understanding of sarcoid immunology. While it was accepted dogma in the 70s that sarcoidosis was a disease of “depressed immunity” and anergy, Yash proposed and championed the concept that it is a pro-inflammatory disease with involvement of activated T-cells, cytokines, etc. Yash and his group also proposed that the active “sarcoid factor” was localized to the cell walls of alveolar macrophages and monocytes or an “autologous kveim” model (this remains an intriguing hypothesis!).

One of the missions of the medical school is community service in which medical school faculty plunged deeply. Yash lived in and loved Greenville where he raised two lovely children.

He was actively involved in the J. H Rose Attendance Area Foundation Advisory Committee; also served as a Member Board of Academic Boosters Club, Rose High School, Greenville, NC and President, Parent Teacher Association, Greenville Middle School, Greenville, NC. He also helped to develop support groups for patients with sarcoidosis & COPD and played leadership roles in the local American Lung Association of NC. We are honoring Dr. Kataria by dedicating our annual Internal Medicine Research Day, which he started in 1987, to the **Yash P. Kataria Internal Medicine Research Day**. We will continue to build on the tradition of encouraging research by inviting leading guest speakers and facilitating scholarship and interaction by our trainees and faculty.



Keynote Address:

“Novel Diuretic Regimens: From Gene to Mouse to Human”

Manoocher Soleimani, MD

***James F Heady Professor of Medicine
Associate Chair for Research
Department of Medicine
University of Cincinnati***

Dr. Soleimani's research over the last 30 years has focused on the identification and characterization of transporters and molecules responsible for electrolyte and acid-base transport in the kidney and gastrointestinal tract, with the ultimate goal of ascertaining their role in health and disease states. He has cloned several relevant genes and characterized their role and regulation in the kidney and/or GI tract in pathophysiologic states.

During his research career, Dr. Soleimani has generated over 10 genetically-engineered mouse models lacking one or more transporters in order to examine their role in vascular volume homeostasis, blood pressure regulation and acid base balance. Recently, he discovered that pendrin (Slc26a4) plays an essential role in salt reabsorption, specifically in the setting of inhibition or inactivation of NCC, the thiazide sensitive transporter. The double knockout of pendrin and NCC causes salt wasting and severe volume depletion. Dr. Soleimani's current studies have identified Slc26a11 as a chloride transporter with a unique localization in the kidney collecting duct. He has generated mice with genetic inactivation of Slc26a11 (KBAT), Slc4a8 (NDCBE) and Slc26a4 (Pendrin) in order to ascertain their role in salt absorption and systemic blood pressure homeostasis.

Dr. Soleimani did his undergraduate work at College of Arts and Sciences, Shiraz University in Iran. He entered medical school at the Shiraz University School of Medicine, where he also completed his residency. In 1984 Dr Soleimani came to the United States to do his fellowship at the Yale University School of Medicine. He then became an assistant professor of Medicine at Indiana University School of Medicine where he also served as a staff physician for the Veterans Administration Hospital in Indianapolis. In 1995, he continued his work at a Veterans Administration Hospital in Ohio when he moved to Cincinnati to accept a position as the Director of Research for the Division of Nephrology at the University of Cincinnati. Dr Soleimani currently serves as the Associate Chair for Research for the Department of Medicine at the University of Cincinnati.

The Keynote Address - Celebrating 30 Years

1987	Morris Reichlin, MD Professor of Medicine University of Oklahoma, School of Medicine	2003	Jeffrey P. Engel, MD Division Head, General Communicable Disease Control State Epidemiologist, Division of Public Health NC Department of Health and Human Services
1988	Jesse Roth, MD Director, Intramural Research National Institute of Diabetes and Digestive and Kidney Diseases, NIH	2004	Helen Burstin, MD, MPH Director of the Center for Primary Care, Prevention and Clinical Partnerships, Agency for Healthcare Research and Quality
1989	Roy Patterson, MD Professor and Chair Department of Medicine Northwestern University Medical School	2005	Marschall S. Runge, MD, PhD Chair, Department of Medicine University of North Carolina at Chapel Hill President, UNC Physicians
1990	Edward W. Hook, MD Professor and Chair Department of Medicine University of Virginia, Health Sciences Center	2006	Jose Caro, MD Vice President, Endocrine Research and Clinical Investigation Lilly Corporate Center, Indianapolis
1991	Albert F. LoBuglio, MD Director, Comprehensive Cancer Center Director, Division of Hematology/Oncology University of Alabama at Birmingham	2007	William Stratford May, MD, PhD Chair, Hematology and Oncology Director, Shands Cancer Center University of Florida
1992	Raj K. Goyal, MD Harvard Medical School Chief Gastroenterology Division Beth Israel Hospital	2008	Phillip A. Bromberg, MD Bonner Professor of Medicine Scientific Director of the Center for Environmental Medicine, Asthma and Lung Biology University of North Carolina at Chapel Hill
1993	Richard E. Kerber, MD Professor of Medicine Associate Director Cardiovascular Division The University of Iowa College of Medicine	2009	Randy L. Jirtle, PhD Professor of Radiation Oncology and Pathology Duke University Medical Center
1994	James S. Louie, MD Chief, Division of Rheumatology Department of Medicine Harbor-UCLA Medical Center	2010	Robert M. Lust, PhD Interim Associate Dean, Research and Graduate Studies Chair, Department of Physiology East Carolina University, Brody School of Medicine
1995	Matthew I. Gilmour, B.Sc., PhD Center for Environmental Medicine and Lung Biology University of North Carolina at Chapel Hill	2011	David C. Goff Jr., MD, PhD Chair, Department of Epidemiology and Prevention Division of Public Health Services Wake Forest University School of Medicine
1998	O. Michael Colvin, MD William Singleton Professor of Cancer Research Director, Duke Comprehensive Cancer Center	2012	Vinay Kumar, MBBS, MD, FRCPath Donald N Pritzker Professor and Chair Department of Pathology University of Chicago
1999	Jerry Palmer, MD Professor of Medicine Director, Diabetes Research Center University of Washington	2013	Paul W. Nobel, MD Chair, Department of Medicine Director, Women's Guild Lung Institute Cedars-Sinai, Los Angeles, California
2000	Thomas Feldbush, PhD Vice Chancellor for Research and Graduate Studies Dean, Graduate School East Carolina University	2014	Vishva Dixit, MD Vice President Early Discovery Research Genentech, Inc.
2001	William B. Applegate, MD, MPH Professor and Chair Department of Internal Medicine Wake Forest University School of Medicine	2015	Jerry R. Mendell, MD Curran-Peters Chair in Pediatric Research Professor of Pediatrics and Neurology Nationwide Children's Hospital and The Ohio State University
2002	William Roper, MD, MPH Dean, School of Public Health University of North Carolina at Chapel Hill.	2016	Manoocher Soleimani, MD James F Heady Professor of Medicine Department of Medicine, Nephrology and Hypertension University of Cincinnati

W. James Metzger, Jr., MD Award

The W. James Metzger, Jr., M.D. award is presented to the most outstanding presentation by a junior faculty member in the Department of Internal Medicine. A peer-review process selects the winner. The recipient of the award receives a certificate and has his/her name engraved on a plaque that is displayed in the Department of Internal Medicine Library. The recipient also receives recognition on the Department of Internal Medicine web site.

Dr. Metzger, a native of Pittsburgh, Pennsylvania, was a graduate of Stanford University and Northwestern University Medical School, Chicago, Illinois. He completed his residency and research fellowship in Allergy-Clinical Immunology at Northwestern University. After serving in the United States Air Force, he came to Greenville in 1984 to join the East Carolina University School of Medicine. During his tenure at East Carolina University, Dr. Metzger rose to the rank of Professor of Medicine. He was Section Head of the Section of Allergy-Immunology and held the appointments of Vice Chairman of Research, Department of Internal Medicine; Executive Director, the Center for Asthma, Allergy, and Immunology; Assistant Vice Chancellor for Clinical Research; Assistant Dean for Clinical Research; and Director, Clinical Trials Office. He was the recipient of the East Carolina University Award for Excellence in Research and Creative Activity and the Distinguished Research Professor of Medicine. His research was published in the New England Journal of Medicine, Nature, and other journals. Dr. Metzger had mentored numerous faculty and fellows.

In August 2000 Dr. Metzger accepted a position as Professor of Allergy, Asthma and Immunology at the National Jewish Medical and Research Center and was a faculty member at the University of Colorado Medical School, Denver, Colorado. He died on November 11, 2000 at the age of 55. Dr. Metzger represented excellence in research.

2001 Recipients:

Carlos A. Estrada, MD, MS
Paul Mehlhop, MD

2007 Recipient:

Christopher Newton, MD
Endocrinology

2012 Recipient:

Maria Ruiz-Echevarria, PhD
Hematology/Oncology

2003 Recipient:

Lisa Staton, MD

2008 Recipient:

Li Yang, PhD
Hematology/Oncology

2013 Recipient:

Moahad Dar, MD
Endocrinology

2004 Recipient:

Cassandra Salgado, MD

2009 Recipient:

Li Yang, PhD
Hematology/Oncology

2014 Recipient:

Mark Bowling, MD
Pulmonary

2005 Recipient:

Barbara J. Muller-Borer, PhD
Cardiology

2010 Recipient:

Sunil Sharma, MD
Pulmonary

2014 Recipient:

Mark Bowling, MD
Pulmonary

2006 Recipient:

Timothy P. Gavin, PhD
Human Performance

2011 Recipient:

Sunil Sharma, MD
Pulmonary

2015 Recipient:

Hsaio Lai, MD
Nephrology

ABSTRACTS

In Presentation Order

OP = Oral Presentation
PR = Poster Research
PV = Poster Vignette

OP1

SIRS WITH IMMUNE CHECKPOINT INHIBITORS

N Sharma, G Stroud, PR Walker, C Cherry, S Cherukuri, S Addepalli

Background: Immune checkpoint blockade has emerged as an attractive treatment option in a wide spectrum of malignancies. Optimal use of these agents requires prompt recognition and management of immune-mediated toxicities. SIRS with immunotherapy is a result of exponential T – cell proliferation with marked elevation of inflammatory cytokines. C-reactive protein (CRP) is a reliable surrogate for IL-6 expression which mediates toxicity in cytokine release syndrome (CRS).

Methods: In this study we prospectively monitored 32 patients with progressive lung cancer who were put on anti-PD-1 between June to December 2015 at a single institution. CRP was drawn before each treatment or in case of hospitalization.

Results: 12 patients (37.5%) were hospitalized with signs and symptoms of SIRS with one or more of the following - fever, tachypnea, tachycardia, hypotension occurring 1-2 days to weeks after immunotherapy. The mean CRP pre-treatment was found to be 38mg/L (0.1–192mg/L; normal<2.6mg/L). The mean CRP in patients who developed symptoms post treatment was 86mg/L (46-144mg/L) compared to 28mg/L (6-71mg/L) in asymptomatic patients. The symptomatic patients were treated with best supportive care, 1-2mg/kg equivalent dose of methylprednisolone. 8 patients were treated with anti- IL-6R monoclonal antibody, tocilizumab at a dose of 4 mg/kg with improvement in inflammatory symptoms and CRP.

Symptoms (no. of patients)	Mean CRP before anti-PD-1	Mean CRP during SIRS	Mean CRP after steroids and anti-IL6
Asthenia (1)		233	60
Pneumonitis (3)	18	158	17
Hypophysitis(2)	17	193	23
Cerebritis (3)	16	127	12
Seizures (1)	148	148	17
Hepatitis (2)	9	105	17

Conclusion: SIRS is a serious and potentially life threatening complication of immunotherapy. Elevations in CRP seem to correlate with symptom severity. Prompt initiation of corticosteroids and IL-6 modulating therapy is critical to optimize the risk/ benefit profile of PD-1 targeted therapy.

Notes:

OP2

OUTCOMES IN PATIENTS WITH STAGE III NON-SMALL CELL LUNG CANCER TREATED WITH CISPLATIN AND IRINOTECAN WITH CONCURRENT THORACIC RADIOTHERAPY: A MULTI-DISCIPLINARY THORACIC ONCOLOGY EXPERIENCE AT EAST CAROLINA UNIVERSITY

J Hildebrand, P Walker

Background and Objectives: Platinum-based doublet chemotherapy with concurrent radiation is the standard of care for unresectable locally advanced non-small cell lung cancer (NSCLC). The National Cancer Database reports a median overall survival (MOS) for stage III NSCLC of 12 months and 3 year OS of 20%. Approximately 40-50% of patients with locally advanced NSCLC will develop brain metastasis during the course of their disease (Mamon *et al* JCO 2005). Prophylactic cranial irradiation (PCI) has been reported to reduce the incidence of brain metastasis to 9% (Pottgen *et al*, JCO 2007). We reviewed patient outcomes from our multi-disciplinary thoracic oncology program database of cisplatin-irinotecan with concurrent thoracic radiotherapy (CRT) in stage III NSCLC. **Methods:** Patients with unresectable stage IIIa/b NSCLC who were treated with definitive cisplatin and irinotecan with CRT between 2011 and 2015 were identified through a search of our thoracic oncology database. 61 patients were identified. Treatment consisted of cisplatin 30mg/m2 and irinotecan 65 mg/m2 on days 1 and 8 every 21 days for 4 cycles. Concurrent thoracic radiation therapy to ≥ 60 Gy started with cycle 2. Survival curves were estimated by Kaplan Meier analysis. Our primary end point was MOS and our secondary endpoint was rate of brain metastasis. **Results:** Patient characteristics: 56.7% squamous, 36.7% adenocarcinoma, 6.6% other histology, 56.7% stage IIIA, 43.3% Stage IIIB. MOS was 14.4 months and 3 year overall survival was 32.9% ($p = 0.037$). Rate of brain metastasis was 11.6% ($p < 0.05$) **Conclusions:** Definitive cisplatin and irinotecan with CRT is effective for treating locally advanced NSCLC and reduces the incidence of brain metastasis at a rate comparable to PCI.

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OP3

ACIDOTIC ACTIVATION OF GPR4 STIMULATES ATF3 EXPRESSION WHICH ACTS AS A NEGATIVE REGULATOR OF INFLAMMATION IN HUMAN UMBILICAL VEIN ENDOTHELIAL CELLS

EA Krewson, L Dong, Z Li, LV Yang

An acidic microenvironment is a characteristic hallmark of many cancers and pathological conditions. This condition can be due to glycolysis which results from deficient vasculature unable to supply oxygen and effectively removing metabolic byproducts. How an acidic microenvironment specifically modifies the blood vessel and its encompassing endothelial cells (ECs) is not clearly defined. Proton-sensing G-protein coupled receptor 4 (GPR4) is highly expressed in ECs and is activated by protonation of histidine residues. In a recent transcriptome analysis, the ER-stress related gene, Activating Transcription Factor-3 (ATF3) was identified as significantly upregulated in HUVECs expressing endogenous level of GPR4 and further increased in GPR4 overexpressing HUVECs (HUVEC/GPR4) in response to acidosis. ATF3 is a member of the ATF/cyclic-adenosine monophosphate response element binding (CREB) family of bZip transcription factors and is an adaptive-response gene induced by a variety of signals including cytokines, physiological stress, and apoptosis. We stably transduced HUVECs with an expression vector that overexpresses ATF3 in HUVECs (HUVEC/ATF3) or a control vector (HUVEC/Vector). We have identified ATF3 as being a negative regulator of VCAM-1, E-Selectin, IL-8 and CXCL2, which are known inflammatory genes, at the mRNA level. Previously, we have identified the nuclear factor kappa-light-chain-enhancer of activated B cells (NFkB) pathway as an imperative factor for acidosis/GPR4-induced inflammatory gene expression. When HUVEC/GPR4 cells were cultured under acidic condition with NFkB inhibitors, inflammatory (VCAM-1, ICAM-1) response was attenuated in a dose-dependent manner. This novel finding identifies that in ECs, GPR4 stimulates ATF3 expression in response to acidosis and that ATF3 negatively regulates inflammation. In contrast, NFkB positively regulates acidosis/GPR4-mediated inflammation. These results demonstrate an intriguing relationship between acidosis induced GPR4 activation, ATF3, NFkB, and inflammation which all have significant implications in a variety of pathosis.

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OP4

ANALYSIS OF RECIDIVISTIC ADMISSIONS FOR DIABETIC KETOACIDOSIS AT VIDANT MEDICAL CENTER

S Ahmed, S Hardee, RJ Tanenberg

Background-More than 100,000 patients are admitted with DKA to US hospitals yearly, resulting in significant treatment costs. At VMC, a 70% increase in DKA admissions was observed from 2011 to 2015. A detailed understanding of the causes and risk factors for readmissions is crucial. The purpose of this study is to analyze the demographics and clinical characteristics of DKA readmissions at VMC. **Method-**Using a retrospective study design, we conducted chart reviews of all adult patients with a primary diagnosis of DKA admitted to VMC from September 1, 2014 to August 31, 2015. Charts reviewed on 23 patients with 3 or more admissions/yr. Demographics: age, gender, type of diabetes, race, family support, health insurance, employment, primary care provider. Clinical characteristics: anion gap, pH, hemoglobin A1C during admission, discharge glucose, discharge appointment, >2 midnights/admission. **Result-** Of 23 patients with ≥ 3 admissions/yr. with total of 108 DKA admissions, 74% had type 1 diabetes, 61% were males, 65% in >30 age group. Race—17 Black, 4- White, 1 Hispanic, 1 other. 15 lived with family, 5 with friends and 3 alone. 13 had Government insurance, 5 were self-pay, 4 had private insurance. 22 were unemployed, 22 had a Primary Care Provider listed. Clinical data revealed 74% had anion gap>17, 26% <17, 46% had pH <7.30, 27% with pH ≥ 7.30 . A1C on admission: 46 % A1C > 10, 19% - 8-10, 7% < 8, 28% not done. 27% had discharge glucose between 200-300, 13% > 300 and 60 %< 200. 46% had discharge appointments. 85% required >2 midnights/admission. **Conclusions-** In our study group with ≥ 3 DKA admissions/yr. ~¼ had Type 1 Diabetes, majority were males over 30 and African-Americans. About 50% lived with family and ~73% had health insurance. Unemployment rate was high. 22 / 23 patients had a PCP listed but unclear if they were utilizing available resources. A majority had discharge glucose <200, but a significant percent had high discharge glucose values. Identifying the groups of patients most at risk for readmission is important so that interventions can be targeted to those at highest risk. Hospital readmission is a high-priority health care quality measure and target for cost reduction. We are initiating a Quality Improvement Project to explore ways to more efficiently manage recurrent DKA admissions, e.g. reducing the waiting time for hospital follow up visits.

Notes:

OP5

TDAG8 STIMULATES NEGATIVE SELECTION AND ACTS AS A TUMOR SUPPRESSOR IN HEMATOLOGIC MALIGNANCIES

CR Justus, EJ Sanderlin, and LV Yang

Background: TDAG8 is a proton sensing G-protein coupled receptor that is highly expressed in leukocytes, thymus, and spleen; however, its expression is significantly reduced in blood cancers. In addition, TDAG8 has been reported to decrease the expression of c-Myc, a potent oncogene in hematologic malignancies. We hypothesize that TDAG8 acts as a tumor suppressor in hematologic malignancies. **Methods:** The U937 cell line originally derived from a patient with histiocytic lymphoma exhibits characteristics of acute myeloid leukemia (AML) of the monocytic lineage. TDAG8 expression was restored in U937 cells with a MSCV-TDAG8-IRES-GFP construct. To determine the effect TDAG8 expression has on U937 cell proliferation, U937 parental (GFP-) and U937/TDAG8 (GFP+) cells were co-cultured for two weeks and the cell populations were quantified using FACS. The effect of TDAG8 expression on primary tumor growth was investigated by subcutaneous injection into the flanks of immuno-deficient SCID mice. Biochemical analysis was performed using qPCR, Western blot, and immunohistochemistry (IHC). **Results:** TDAG8 gene expression was significantly reduced or absent in U937, Ramos, RPMI 8226, K562, and Jurkat cells in comparison to normal leukocytes. The co-culture cell competition assay established that restoration of TDAG8 expression in U937 cells stimulates negative selection resulting in a reduced U937/TDAG8 cell population in comparison to the U937/parental cells. Biochemical analysis confirmed that restoring TDAG8 expression inhibits c-Myc expression and stimulates the cleavage of caspase 9, 7, and 3. TDAG8 expression also significantly inhibited U937 tumor growth in SCID mice. IHC confirmed that c-Myc expression is reduced and cleaved PARP is increased in U937/TDAG8 tumors when compared to the controls indicating a similar mechanism in vivo. **Conclusion:** In this study we demonstrate that TDAG8 acts as a tumor suppressor in U937 AML cells by inhibiting c-Myc expression and stimulating apoptosis signaling. Uncovering TDAG8 as a tumor suppressor is valuable because it is a G-protein coupled receptor, which is a highly targeted group of proteins for therapeutic modulation in human cancer and disease.

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OP6

PLASMA NOREPINEPHRINE AND DOPAMINE LEVELS ARE INDEPENDENT PREDICTORS OF RISK FOR ATRIAL FIBRILLATION FOLLOWING CARDIAC SURGERY

P Gudimella, CN Beatty, JT Efird, P Gudimella, KA Thayne, AP Kypson, EJ Anderson

Background: Postoperative atrial fibrillation (POAF) remains the most common (~30% of patients) and costly complication following cardiac surgery, although its etiology remains obscure. In a previous study, we established that patients who experience POAF following cardiac surgery have significantly higher monoamine oxidase (MAO) activity in their right atrium, compared with patients who remain in sinus rhythm. Since MAO is the primary enzyme responsible for catecholamine metabolism, we tested the hypothesis that plasma catecholamines norepinephrine (NE), dopamine (DA), and epinephrine (Epi), along with plasma MAO-B, would also be associated with an increased risk of POAF.

Methods: A total of 324 patients undergoing cardiac surgery at East Carolina Heart Institute were prospectively enrolled from July 2014 through December 2015. Blood samples were obtained preoperatively, prior to the patients receiving anesthesia. Plasma NE, DA, Epi and MAO-B were measured using ELISA method. Poisson regression analysis was performed on quartiles of these variables, using POAF as the outcome variable.

Results: Plasma NE and DA were significantly associated with POAF along with age >65, heart failure, and preoperative atrial fibrillation in the univariable analysis, while plasma MAO-B and Epi were not. Adjusting for past medical history and comorbidities, among other variables, quartile 4 of plasma NE and DA continued to be highly significant and independently associated with POAF with a relative risk and 95% confidence interval of 4.0 (1.5-10) and p-value <0.0001.

Conclusions: These findings suggest that preoperative levels of plasma NE and DA may have clinical utility as predictive markers for POAF, potentially allowing for preventative therapies in high-risk patients. This would lead to decreased hospital length of stay and associated healthcare costs, in addition to improved patient outcomes. Further studies are needed to validate their utility as predictive markers, and to better understand their mechanisms in arrhythmogenesis.

Notes:

OP7

THE EFFICACY OF SGLT-2 INHIBITORS COMPARED TO DPP4 INHIBITORS AS ADD-ON THERAPY TO METFORMIN: A META-ANALYSIS

BM Mishriky, DM Cummings, RJ Tanenberg

Introduction: Sodium-glucose cotransporter-2 (SGLT-2) inhibitors constitute a new class of diabetes medications that reduce renal glucose reabsorption and increase urinary glucose excretion. We performed a meta-analysis to explore the efficacy and safety of SGLT-2 inhibitors compared to dipeptidyl peptidase-4 inhibitors (DPP-4i) as add-on therapy to metformin in patients with Type 2 diabetes mellitus (T2DM).

Methods: We searched MEDLINE for randomized trials comparing SGLT-2 inhibitors to DPP-4i as add-on therapy to metformin in inadequately controlled T2DM. We pooled studies reporting outcomes at ≤ 26 weeks (w) together and those with outcomes at ≥ 52 w were pooled together. Number needed to harm (NNH) was calculated for statistically significant side effects.

Results: Six studies [1-6] were included. There was a statistically significantly greater reduction in hemoglobin A1c (A1c) at ≥ 52 w favoring SGLT-2 inhibitors compared to DPP-4i, but not at ≤ 26 w (Mean Difference (MD) [95% Confidence Interval (CI)] = -0.11% [-0.20, -0.03] and -0.07% [-0.18, 0.03] respectively). There was greater weight reduction favoring SGLT-2 inhibitors (MD [95% CI] = -2.31kg [-2.66, -1.96] at ≤ 26 w and -2.45kg [-2.83, -2.07] at ≥ 52 w) compared to DPP-4i. SGLT-2 inhibitor treated patients also had greater reduction in systolic and diastolic blood pressure compared to DPP-4i. The incidence of genital infection was significantly higher in the SGLT-2 inhibitor group compared to the DPP-4i group (NNH=21).

Conclusion: Both SGLT-2 inhibitors and DPP-4i reduced A1c over time and can be considered as reasonable options for add-on therapy to metformin. SGLT-2 inhibitors provide modestly greater A1c reduction and weight loss, and can reduce blood pressure, but may cause more genital infection when compared to DPP-4i. In patients who have inadequately controlled T2DM, hypertension, obesity, and have no history of genital infection, SGLT-2 inhibitors may provide a more balanced reduction of key risk factors for diabetes complications.

References: [1]Diabetes Care 2012; 35: 1232-38; [2]Diab Obes Met 2013; 15: 1154-60; [3]Diabetologia 2013; 56: 2582-92; [4]Diabetes Care 2013; 36: 4015-21; [5]Diabetes Care 2015; 38: 376-83; [6]Diabetes Care 2015; 38: 384-93

Notes:

OP8

PULMONARY REHABILITATION: A RETROSPECTIVE STUDY IN EASTERN NORTH CAROLINA

SN Chalise, H Shaheen, MZ Rizwan, K O'Brien, R Shaw

Background: Many chronic illnesses including cardiovascular disease, stroke, cancer, and diabetes have higher mortality in eastern North Carolina (ENC) compared to the rest of the state. Surprisingly COPD has a lower mortality. Pulmonary Rehabilitation (PR) is an evidenced based measure to benefit COPD patients. The purpose of this research was to objectively assess the benefits of our PR program to COPD patients in ENC. The measures used to assess benefits of the PR program were: 6 minute walk distance (6MWD), quality of life (QOL) scores, and COPD exacerbation frequency.

Methods: The study proposal was approved by ECU IRB. Eligibility criteria were 18 years of age or older, COPD diagnosed based on clinical criteria and pulmonary function tests (PFT) and patients who completed PR. Exclusion criteria were: 1. No PFT for COPD diagnosis. 2. Not completing PR program. 3. Failed to perform PR exercise secondary to other medical conditions such as osteoarthritis, heart failure, and prior stroke. The data was collected by chart review for the patients who completed PR from January 2012 through December 2013. Our data collection included QOL scores (SF-36) and 6MWD to measure exercise capacity before and after PR. We also collected data on COPD exacerbation frequency 1 year before and 1 year after PR. The data was analyzed using statistical software SPSS version 22.0.

Results: Out of 157 patients screened, 51 patients met inclusion criteria. Severity of COPD was based on GOLD Guidelines and the distribution was as follows (parenthesis indicates number of patients): mild (2), moderate (12), severe (23) and very severe (14). The PR program resulted in improvement in 6MWD up to a mean of 263.8 feet ($P < 0.001$) and decrease in COPD exacerbation frequency by 0.3 ($P = 0.04$). Regarding QOL, social function improved by a score of 7.4 ($P < 0.001$) and mental health improved by 4.1 ($P = 0.001$). However, role evaluation did not reach statistical significance ($P = 0.06$).

Conclusions: PR program at our center shows a positive impact in terms of exercise capacity, COPD exacerbation rate and some aspects of quality of life in Eastern NC population. The improvement in 6MWD was greater than that reported by other institutions.

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OP9

THE pH-SENSOR GPR4 POTENTIATES INTESTINAL INFLAMMATION IN A MOUSE MODEL OF INFLAMMATORY BOWEL DISEASE

EJ Sanderlin, K Lertpiriyapong, NR Leffler, Q Cai, H Hong, J Fox, V Bakthavatchalu, JZ Oswald, CR Justus, EA Krewson, D O'Rourke, LV Yang

GPR4 is a pH-sensing G protein coupled receptor that can be activated by extracellular acidosis, which is the accumulation of extracellular hydrogen ions, through protonation of several histidine residues on the extracellular domains. Recent studies showed that activation of GPR4 by acidosis increased expression of numerous inflammatory and stress response genes in vascular endothelial cells (ECs) and increased adhesion of leukocytes to ECs which is necessary for leukocyte extravasation during an inflammatory response. Tissue acidosis is a hallmark for inflamed tissues and can commonly exist in the colon mucosa of patients with inflammatory bowel disease (IBD). We examined the role of GPR4 in the governance of intestinal inflammation using a dextran sulfate sodium (DSS)- induced mouse colitis model. Wild-type and GPR4-deficient mice were treated with 3% DSS suspended in drinking water for 7 consecutive days for the induction of acute colitis. Clinical parameters commonly associated with IBD, such as weight loss and fecal blood content, were assessed daily. GPR4-deficient mice showed less severity of disease when compared to wild-type mice. Clinical parameters such as fecal score, body weight loss, colon shortening, and mesenteric lymph node expansion of GPR4-deficient mice were less severe than wild-type mice. Histopathological analysis confirmed GPR4-null mice had less inflammation, leukocyte infiltration, edema, and isolated lymphoid follicle development compared to wild-type. Additionally, inflammatory molecule expression including E-selectin, ICAM-1, VCAM-1, COX-2, and CXCL2 are reduced in whole colon tissues from GPR4-deficient mice. Collectively, these results suggest GPR4 deficiency reduces intestinal inflammation in the DSS-induced IBD mouse model and that GPR4 inhibitors could be a promising therapeutic in treatment of IBD.

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OP10

NEOADJUVANT METRONOMIC CHEMOTHERAPY IN TRIPLE NEGATIVE BREAST CANCER (NCT00542191): UPDATED RESULTS FROM A PHASE II TRIAL

J Hildebrand, P Walker

Background: Triple negative breast cancer (TNBC) lacks effective targeted therapies, limiting treatment to cytotoxic chemotherapy alone. One third of patients with TNBC achieve pathologic complete response (pCR) with standard neoadjuvant chemotherapy (Cortazar Lancet 2014). Carboplatin has been reported to further improve response (von Minckwitz Lancet 2014). It has been reported that patients who attain pCR have improved survival. We sought to determine the benefit of neoadjuvant metronomic chemotherapy utilizing doxorubicin with cyclophosphamide followed by paclitaxel with carboplatin in women with TNBC. **Methods:** Patients with TNBC > / = 2 cm were eligible. Treatment consisted of weekly doxorubicin 24 mg/m² + daily oral cyclophosphamide 60 mg/m² x 12 weeks followed by weekly paclitaxel 80 mg/m² + weekly carboplatin AUC 2 x 12 weeks. Patients received standard surgery and radiation therapy as indicated. The primary endpoint was pCR, secondary endpoints were 5 year survival and toxicities. **Results:** Between July 2006 and March 2014, 21 patients with TNBC were enrolled, 18 were eligible for analysis and 3 patients died before completing treatment. 1 patient died from pulmonary embolism, 1 from neutropenic sepsis, 1 from non-neutropenic sepsis. Patient characteristics: 5 patients had clinical T4 disease, 12 had clinical node positive disease, 71.4% stage II, 28.6% stage III. The rate of pCR was 47.6% (p = 0.031). 5 patients (27.8%) achieved a partial response, 1 patient (5.5%) maintained stable disease and 2 patients (11%) progressed on treatment. 5 year survival was 58.4%. pCR was significantly associated with survival (p = 0.009). 90% at 5 years for those who achieved pCR versus 12.5% for those who did not. Hematologic toxicities were not uncommon. 62% of patients experienced G3 or 4 neutropenia, 24% experienced febrile neutropenia. 17% experienced anemia. 12 patients discontinued treatment early due to treatment related toxicities. **Conclusions:** Neoadjuvant metronomic chemotherapy with weekly doxorubicin plus oral cyclophosphamide followed by weekly paclitaxel plus carboplatin is an effective regimen for achieving a pCR in patients with TNBC. Those patients who achieve a pCR have improved survival.

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OP11

BASELINE PATIENT CHARACTERISTICS FOR INSYNC: A PHASE II TRIAL REGARDING THE EFFECT OF COMPREHENSIVE SYMPTOM MANAGEMENT SERVICES ON INFLAMMATION AND SURVIVAL IN METASTATIC LUNG CANCER

CRG Stroud, BS Brown, P Walker

Introduction

There is a growing body of evidence that implicates inflammation as a mechanism of disease progression and reduced survival in patients with advanced cancer (Laird et al. Oncologist 2013;18:1050-5). In patients with metastatic lung cancer, mGPS as represented by elevated CRP and reduced serum albumin (< 3.5 g/dL) is associated with inferior survival (Simmons CP et al. Lung Cancer 2015;88:304-9.)

Methods

INSYNC is a single-arm phase II trial where all patients receive comprehensive symptom management services via a clinical-pharmacist practitioner directed service (Valgus et al. Am J Health Syst Pharm 2011;68:613-19). Patients with metastatic lung cancer and an ECOG PS of 2 or less were eligible for enrolment. Serum albumin and CRP were drawn at baseline, 4 months and 10 months and q 4 months until death. Veristrat® (Biodesix Inc. Boulder, Colorado) assay was drawn at baseline, 4 months, and 10 months. QOL data by FACT-L survey is collected at each interval.

Results

Twenty-three patients had baseline evaluations complete with albumin, and CRP. Mean CRP was 54.7 mg/L. Mean serum albumin was 3.46 g/dL. The number of patients with mGPS of 0, 1, and 2 were 4 (17%), 10 (44%) and 9 (39%), respectively. Ten of the 23 patients are alive and being followed. Of note, there were 4 patients (17%) with a CRP > 10 mg/L and an albumin of 3.5 g/dL. Four month follow-up data was available for 5 patients. Mean CRP was 81.02 mg/L. Mean serum albumin was 3.56 g/dL. The number of patients with mGPS of 0, 1, and 2 were 0, 2 (40%) and 3 (60%), respectively. Veristrat® results are not yet available and will be processed in bulk once target accrual (N =100) is complete.

Discussion

Lung cancer patients in Eastern North Carolina seem to possess a particularly poor inflammatory signature with significant implications for quality of life and survival.

Notes:

OP12

CAN PROSPECTIVE AUDIT AND FEEDBACK DECREASE INAPPROPRIATE ANTIBIOTIC USE IN LONG TERM CARE FACILITIES?

MS Ashraf, K Shah, M Dhillon, H Nguyen, A Abubaker, A Stang, P Cook

Background: An antimicrobial stewardship program consisting of prospective audit and feedback was implemented in 4 long term care facilities (LTCFs). We hypothesized that the program would decrease the proportion of inappropriate antibiotic use over the period of 12 months.

Methods: Nursing personnel at the 4 LTCFs faxed daily report of all new antibiotics started within last 24 hours in their facility to the Infectious Diseases (ID) office. One ID fellow reviewed pertinent data in the electronic health records and interviewed the patient's nurse over the phone, if needed. Under the supervision of the ID attending, a decision was made regarding appropriateness of the antibiotic based on established evidence-based guidelines. If deemed inappropriate, the prescribing provider was called and recommendations were made to change or stop the antibiotic order, and a rationale was provided. Data regarding the diagnosis, appropriateness of orders, reason for inappropriateness, and acceptance or rejection of recommendations were recorded. Linear regression analysis was used to study the trend of inappropriate antibiotic use over the period of 12 months.

Results: 181 antibiotic orders were reviewed during the year (April 2014 to March 2015), of which 74 (40.9%) were deemed inappropriate. Most of the orders were for urinary tract infections (53.6%), skin and soft tissue infections (17.7%) and upper or lower respiratory tract infections (15.5%). Antibiotics were not indicated in 28.4% cases of inappropriate use, and duration was incorrect in 40.5% of cases. A total of 55 recommendations were made; 87.7% of those were accepted. Overall, 27.6% of orders were inappropriate in 1st quarter followed by 44.6%, 64% and 40.4% in 2nd, 3rd and 4th quarters. No significant change was noticed in the proportion of inappropriate antibiotic use per month over 12 months period (p=0.5)

Conclusion: Prospective audit and feedback did not lead to decrease in proportion of inappropriate antibiotic orders in the LTCFs over the period of one year. However, it has a potential of decreasing inappropriate antibiotic days as the providers accepted most of the suggested recommendations.

Notes:

INTERMITTENT HIGH DOSE INTRAVENOUS IMMUNOGLOBULIN AS TREATMENT FOR DONOR SPECIFIC ANTIBODIES IN RENAL TRANSPLANT RECIPIENTS

P Bolin, K Parker, F Rana, W Bryant, P Jawa and R Harland

Background: Donor-specific HLA antibody (DSA) formation in post-renal transplant patients is associated with chronic rejection and graft failure. Previous studies in our population have indicated that DSA formation is a strong predictor of graft loss (>20% at 3 years). Detection of DSA may occur months or years after transplantation and often occurs months before graft dysfunction, affording providers time to intervene. This study proposed to utilize high dose intravenous immunoglobulin (IVIG) to reduce DSAs and therefore prevent future graft dysfunction.

Methods: Thirty-eight DSA positive renal transplant patients were given intermittent high dose IVIG (2 grams/kg) for at least one month and a maximum of six months. DSA levels and renal function were monitored during the course of treatment. HLA single antigen beads were analyzed by Luminex to determine donor specificity and strength of the antibodies, measured as mean fluorescence intensity (MFI). Participants' immunosuppression consisted of thymoglobulin induction, Prednisone, Tacrolimus, and MPA.

Results: Transplant to development of DSA averaged 44 months. Following IVIG treatment, 92% of patients with Class I DSA experienced a mean reduction of 72% and 82% with Class II DSA experienced a mean reduction of 53%. Graft function remained stable in most patients with DSA reduction.

Conclusion: IVIG appears to lower DSA intensity; however, it may not always correlate with better graft function. The temporal relationship of DSA and IVIG may be the most critical step in achieving success. This intervention for DSA reduction needs further investigation to evaluate the long term benefits of IVIG.

Notes:

PR1

ROLE OF PUF-8/PUMILIO AND CSR-1/ARGONAUTE IN CELL FATE DECISION OF CAENORHABDITIS ELEGANS GERMLINE

DS Yoon, MH Lee

Background: The nematode *Caenorhabditis elegans* hermaphrodites produce a discrete number of sperm during larval development and then switch to produce oocyte during adulthood. This sperm-oocyte switch is tightly regulated by a number of positive and negative genetic regulators. Its aberrant regulation results in sterility. Previous, it was reported that two PUF RNA-binding proteins, PUF-8 and FBF-1 act redundantly to inhibit sperm fate specification in the *C. elegans* germline. PUF-8 also works together with LIP-1 (dual specificity phosphatase) to repress sperm fate specification by inhibiting Ras-MPK-1 (an ERK homolog) signaling pathway in the *C. elegans* germline. These results hypothesize that PUF-8 may act as a central regulator in the sexual fate decision.

Methods: Here, we performed RNA interference (RNAi) screening to identify more regulators that probably function with PUF-8 to inhibit sperm fate specification in the *C. elegans* germline. To understand the function of PUF-8 and a candidate regulator, CSR-1, on germline development, we performed RNA interference, western blot, smFISH, and immunohistochemistry.

Results: Our focused RNAi screening has identified CSR-1 (a homologous to mammal Argonaute proteins) as a key regulator: although *csr-1(tm892)* single mutants are sterile because of abnormal chromosome segregation, they produce sperm and oocytes. However, most *puf-8(q725); csr-1(tm892)* double mutants had sperm fate cells and no typical oogenic germ cells. Notably, these germline defects were rescued by the inhibition of Ras-MPK-1 (an ERK homolog) signaling pathway. These results indicate that PUF-8 and CSR-1 act redundantly to repress sperm fate specification by inhibiting Ras-MPK-1/ERK signaling pathway in the *C. elegans* germline. Next, to test whether CSR-1 is sufficient to induce oocyte fate, we analyzed the germline phenotype of CSR-1::GFP transgenic animals, which is expected to overexpress CSR-1 in the germline. Surprisingly, CSR-1 overexpression induced oogenic germ cells even male germlines.

Conclusions: All together, we suggest that PUF-8 and CSR-1 may induce oogenic germ cell fate by inhibiting Ras-MPK-1/ERK-mediated sperm fate specification. Importantly, these regulators are broadly conserved, hypothesizing that similar molecular circuitry may control germ cell fate in other organisms, including humans.

Notes:

PR2

CELLULAR LOCALIZATION OF NRF2 DETERMINES THE SELF-RENEWAL AND OSTEOGENIC DIFFERENTIATION POTENTIAL OF HUMAN MESENCHYMAL STEM CELLS VIA P53-SIRT1 AXIS

DS Yoon, Y Choi, MH Lee, JW Lee

Background: NRF2 plays an important role in defense against oxidative stress at the cellular level. Recently, the roles of NRF2 in embryonic and adult stem cells have been reported, but its role in maintaining self-renewal and differentiation potential remain unknown. We studied the mechanisms of NRF2 action in mesenchymal stem cells (MSCs) derived from human bone marrow.

Methods: Bone marrow aspirates were obtained from posterior iliac crests of 12 adult donors. CFU-F assay was performed to evaluate self-renewal capacity of MSCs. To evaluate the correlation between NRF2 and SIRT1, we performed RNA interference, real-time PCR, western blot analysis, and immunocytochemistry. t-BHQ and OTA were used to investigate the effect of NRF2 activity on the self-renewal and multi-potency of MSCs.

Results: We found that the cellular localization of NRF2 changed during prolonged cell passage and osteogenic differentiation. Blocking the nuclear import of NRF2 using OTA induced the loss of the self-renewal and osteogenic potential of EP MSCs. Conversely, reinforcing the nuclear import of NRF2 using t-BHQ improved the self-renewal capacity and maintained the differentiation potential in the osteogenic lineage of EP MSCs. Real-time quantitative PCR and a western blot analysis showed that NRF2 positively regulates SIRT1 at the mRNA and protein levels via the negative regulation of p53. The self-renewal and osteogenic potential suppressed in OTA-treated or NRF2-targeting small hairpin RNA (shRNA)-infected EP MSCs were rescued by introducing small interfering RNA (siRNA) targeting p53. t-BHQ treatment in late passage (LP) MSCs, which lost their self-renewal and osteogenic potential, reversed these effects. In LP MSCs treated with t-BHQ for approximately 7 days, the phosphorylation and nuclear localization of NRF2 improved and SIRT1 protein level increased, whereas p53 protein levels decreased.

Conclusions: In conclusion, our results suggest that NRF2 plays an important role in regulating p53 and SIRT1 to maintain MSC stemness. This study is the first to establish a functional link between NRF2 and SIRT1 expression in the maintenance of MSC self-renewal and differentiation potential.

Notes:

PR3

THE ROLE OF PUF-9/PUF RNA-BINDING PROTEIN IN CAENORHABDITIS ELEGANS

RP Parekh, MH Lee

Background: PUF (Pumilio and FBF) RNA-binding proteins are conserved stem cell regulators. PUF proteins maintain germline stem cells (GSCs) in worms and flies, and neoblasts in planaria. PUF proteins also have been implicated in mammalian stem cell regulation. *C. elegans* has 12 PUF proteins. Among them, FBF-1, FBF-2, and PUF-8 are critical for GSC maintenance and its cell lineage commitment (Sperm or oocyte fate). However, the function of other PUF proteins remains largely unknown. Specifically, PUF-8 maintains GSC homeostasis by inhibiting several target genes. Therefore, mutants lacking PUF-8 can either promote germline tumors or GSC loss, depending on genetic context. PUF-9 belongs to the same phylogenetic branch with PUF-8, but the function of PUF-9 has not yet been studied. In this study, we will investigate the role of PUF-9 in *C. elegans* GSC maintenance and cell lineage commitment as well as we will identify genetic partners that work with PUF-9 by RNAi screening.

Methods: PUF-8 works together with other P granule-associated RNA regulators to orchestrate germline development. Therefore, in this study, we will perform a focused RNAi screening against P granule-associated RNA regulators in *puf-9* mutants. Specifically, we will identify PUF-9 partner associated with GSC maintenance and cell lineage commitment. Germline phenotypes will be determined by staining dissected gonads with cell type specific antibodies: PhosphoHistone H3 for mitotic cells, MSP for sperm, and RME2 for oocytes.

Results: Our pilot RNAi screening showed PUF-9 did not work with PUF-8 and LIP-1. Our on-going screening will identify an important regulator.

Conclusion: Since PUF-8 and PUF-9 are very close to human PUF (Pum2) protein, our results may provide insights into the function of human Pum2/PUF in stem cell regulation, broadly.

Notes:

PR4

NOTCH SIGNALING MEDIATES DRUG RESISTANCE IN COLORECTAL CANCER CELLS VIA EFFECTS ON DNA REPAIR PROTEINS

DC George, AG Clark, A Khan, DA Weidner, G Sigounas

Background: Colorectal cancer (CRC) is the second leading cause of cancer deaths in the United States and treatment options are limited if surgery and chemotherapy are unsuccessful. Recent studies have implicated the Notch signaling pathway in conferring drug resistance to tumor cells. Our group has previously shown that Notch-1 signaling is highly associated with promoting cancer stemness and epithelial to mesenchymal transition in CRC. Furthermore, we observed that colon tissue samples isolated from CRC patients expressed higher levels of proteins associated with the Base Excision Repair (BER) pathway. Herein, we hypothesized that Notch signaling confers drug resistance to CRC cells via signaling effects on proteins associated with DNA repair. **Methods:** To assess our hypothesis, we utilized the colon cancer cell line HCT-116. For the overexpression of Notch1, parental HCT-116 cells were transduced with an IRES-GFP retrovirus expressing the human intracytoplasmic domain of Notch-1 (ICN1). HCT-116 cells were also transduced with a small hairpin mRNA construct (Sh-59) that effectively knocked down ICN action. Chemoresistance was determined by exposing the cell lines to cytarabine, a potent DNA damaging agent. Cell culture and Western blot analysis were performed using standard methodology. **Results:** Targeting Notch1 via small hairpin mRNA transduction in the colon tumor cell line HCT-116 (Sh-59 cells) resulted in a significantly decreased expression of the critical BER DNA repair enzymes Poly (ADP-Ribose) Polymerase 1 (PARP1) and 8-Oxoguanine glycosylase (OGG1), by 2.3-fold and 30%, respectively. Reduced expression of Hes-1 (25%) and Smad-3 (45%), were also observed. These changes were accompanied by significant chemo sensitive responses to cytarabine in terms of colonosphere growth and proliferation as opposed to cells expressing constitutively active Notch1 signaling. ICN cells grown in the presence of cytarabine expressed 25% higher growth compared to the parental cell line. However, Notch1 null cells showed 35% reduced growth compared to the ICN cells. **Conclusions:** These data indicate a key role for Notch signaling in conferring drug resistance to CRC cells via effects on DNA repair pathways, and highlight the potential use of Notch-1 inhibitors in combination with PARP1 inhibitors to effectively target highly drug resistant CRC cells.

Notes:

PR5

INHIBITION OF NOTCH-3 DECREASES NOTCH-1-INDUCED TUMORIGENESIS OF COLORECTAL CANCER

KE Vinson, AG Clark, A Khan, G Sigounas

Background: As the second leading cause of cancer death in the United States, Colorectal Cancer (CRC) poses a significant threat to both men and women alike. The majority of cases arise from environmental causes and are widely attributed to dysfunctional cellular pathways. Currently, the CRC progression model maintains that the cancer growth, relapse and metastasis are due primarily to cancer stem cells (CSCs) through epithelial to mesenchymal transition (EMT). We have recently reported that Notch-1 signaling is highly associated with promoting cancer stemness and EMT in CRC. However, this effect is abrogated by DAPT (a γ -secretase inhibitor) treatment. Thus, we hypothesized that the effect of Notch-1 on stemness and EMT in CRC is mediated by Jagged-1 via another member of the Notch pathway, Notch-3. **Methods:** To assess our hypothesis, we utilized the colon cancer cell line HCT-116. The parental HCT-116 cells were transduced with an IRES-GFP retrovirus expressing the human intracytoplasmic domain of Notch-1 and produced the ICN1 cell line. Then the ICN cells were transduced with a small hairpin mRNA construct that effectively knocked down Notch-3 and created the sh-ICN-Notch-3 cell line. Growth ability, plating efficiency and colosphere formation were determined as previously described. Cell culture and Western blot analysis were performed using standard methodology. **Results:** We found that targeting Notch-3 via small hairpin mRNA transduction in the colon tumor cell line sh-ICN-Notch-3 resulted in a highly decreased expression of Notch-3. This reduction was accompanied by significant changes in terms of colosphere formation and growth as opposed to cells expressing constitutively active Notch-1 signaling and having normal Notch-3. A 2.25-fold higher colosphere formation was found in ICN cells compared to the parental cell line HCT-116. This difference was higher in medium size colospheres (3.5-fold). However, Notch-3 null cells showed a 35% reduction in colosphere formation compared to the ICN cells. This difference was observed in colospheres of both high (33%) and medium/low (37%) proliferative capacity. There was no difference regarding adherent culture growth and plating efficiency between the two cell lines. **Conclusions:** These data indicate a key role for Notch-3 signaling in Notch-1-induced tumorigenesis mediated by Jagged-1. They also highlight the potential use of Notch-3 inhibitors to effectively target aggressive CRC tumors.

Notes:

PR6

BK VIRUS STIMULATES HUMAN PROXIMAL KIDNEY TUBULE CELLS TO UNDERGO MULTIPLE ROUNDS OF DNA SYNTHESIS

JG Arthur, TD Friedrich, JM Lehman

Background: Since a large percentage of the population have antibodies to BK virus they potentially harbor the virus, which can infect susceptible cells in immunosuppressed patients who have undergone kidney transplantation, potentially leading to the development of polyomavirus associated nephropathy (PVAN). This study utilized/developed an *in vitro* model of human proximal kidney tubule cells (HREC) infected with BK virus to study the effect(s) of drugs that suppress the DNA damage repair (DDR) pathways on BK virus replication. Previous studies had shown that activation of the DDR pathways were necessary for efficient viral replication, thus suppression of these pathways may reduce viral production *in vitro* and *in vivo*.

Methods: HREC were obtained from Lifeline Cell Technology (Walkersville, MD), grown, infected with the Dunlop variant of the BK virus and fixed at various time points. Viral expression/infection was measured using antibodies PAb 416 and PAb 597 to quantify levels of Large T antigen and V antigen. Propidium iodide (PI) was utilized to assay DNA content/cell using two color laser scanning cytometry. Data was collected, stored and analyzed with the iCys 3.4.12 iBrowser V3.4 software allowing determination of infection efficiency, morphology and DNA content/cell.

Results: The results from 4 independent experiments demonstrated a progressive/efficient infection with 50-70% of the cells expressing T/V antigen at 120hrs. The DNA content of the cell/population increased to 8-12C DNA content, which showed that the infected cells were recruited into multiple S phases without mitosis. The infected cells demonstrated a 2-4 fold increase in nuclear area and diameter retaining mononuclearity of the BK infected cells.

Conclusions: The HREC/BKV model described provides an opportunity to assay the effect of drugs which suppress the DDR pathways thus reducing infectious virus production potentially offering an approach to the therapy of PVAN. The increase in cellular DNA (multiple S phases without mitosis) following BK infection is an interesting finding that correlates with results obtained with the polyomavirus, SV40, which has approximately 80% homology to BK virus suggesting that the molecular/replication events may be similar for these two viruses.

Notes:

PR7

EXPOSURE TO A MYCOBACTERIAL ANTIGEN EXACERBATES INFLAMMATION AND FIBROSIS IN A MULTI-WALL CARBON NANOTUBE MWCNT MODEL OF PULMONARY GRANULOMATOUS DISEASE

A Malur, BP Barna, M McPeck, L Dobbs, CJ Wingard & MJ Thomassen

Background: Recent studies have suggested additive effects of environmental pollutants and microbial antigens in respiratory disease. Because of increasing concern of environmental exposure to nanotubes we established a murine granuloma model (AJRCMB 2011, 45: 858) in which multiwall carbon nanotubes (MWCNT) elicit a granulomatous pathology. MWCNT-elicited granulomatous disease is chronic, and characterized by elevated pro-inflammatory cytokines with T cell and macrophage recruitment – all traits found in sarcoidosis. ESAT-6 is a *Mycobacterium tuberculosis* secreted protein and T cells from patients with sarcoidosis have been reported to react to ESAT-6 peptides. We hypothesized that ESAT-6 might exacerbate granulomatous inflammation induced by MWCNT.

Methods: Experiments were carried out in which MWCNT (100 µg) ± ESAT-6 peptide 14 [NNALQNLRITSEAG] (20 µg) were instilled into wild-type and PPAR γ KO mice. Control animals received instillations of vehicle (sham) or ESAT-6 alone. Animals were sacrificed after 60 days for analyses of granuloma incidence, fibrosis and bronchoalveolar lavage (BAL) cell expression of CCL2, MMP12, and osteopontin (OPN) mRNA.

Results: Morphologic analysis indicated more abundant and larger granulomas (2-fold increase, $p=0.03$) in mice receiving MWCNT+ESAT-6 than in mice with only MWCNT. This effect was observed in both wild-type and PPAR γ KO mice. Trichrome staining revealed a greater extent of fibrosis in mice receiving MWCNT + ESAT-6 than mice with MWCNT. Mice with ESAT-6 had no granulomas or fibrosis and BAL cell cytokine expression did not differ from sham controls. BAL cell expression of CCL2, MMP12, and OPN was significantly higher in MWCNT + ESAT-6 mice than in mice receiving MWCNT alone or in sham controls ($p<0.05$). Findings indicated that ESAT-6 instillation exacerbated MWCNT-mediated granuloma formation as well as fibrosis. ESAT-6 also augmented BAL cell expression of the pro-inflammatory chemokine, CCL2, as well as the tissue remodeling factors, MMP12 and OPN.

Conclusion: Data suggest that simultaneous exposure to ESAT-6 mycobacterial antigen and environmental MWCNT may worsen chronic granulomatous disease and fibrosis.

Notes:

PR8

ELEVATED MICRORNA-33 IN CARBON NANOTUBE-MEDIATED CHRONIC GRANULOMATOUS DISEASE AND HUMAN SARCOIDOSIS PATIENTS IS ASSOCIATED WITH ALVEOLAR MACROPHAGE LIPID TRANSPORTER DYSFUNCTION

M McPeck, A Malur, M Fessler, C Wingard, BP Barna, MJ Thomassen

Background: We established a murine model of multiwall carbon nanotube (MWCNT)-induced chronic granulomatous disease which bears many similarities to human sarcoidosis, a debilitating inflammatory disease of unknown cause. At 60 days after oropharyngeal MWCNT instillation, bronchoalveolar lavage (BAL) cells from wild-type mice express an M-1 phenotype with elevated pro-inflammatory cytokines and reduced peroxidase proliferator-activated receptor gamma (PPAR γ) - characteristics also present in sarcoidosis. Because of this PPAR γ repression, we hypothesized that MWCNT might also mediate repression of PPAR γ -related pathway genes such as the lipid transporters ABCA1 and ABCG1, both of which display anti-inflammatory properties and are essential to pulmonary homeostasis.

Methods: Alveolar macrophages of patients with sarcoidosis and mice bearing MWCNT induced granulomas were evaluated for expression of ABCA1 and ABCG1 and the microRNA-33. **Results:** The significant repression of BAL cell ABCA1 (-1.7 fold) and ABCG1 (-2.0 fold) expression was observed in MWCNT instilled animals compared to sham controls. Exploration of potential regulatory factors revealed that microRNA (miR)-33, a lipid transporter regulator in atherosclerosis models, was strikingly elevated (13.9 fold, $p<0.05$) in BAL cells from MWCNT-instilled but not sham control mice. Elevated miR-33 was also detected in murine granulomatous lung tissue. Because miR-33 had not been cited in the lung previously, we carried out *in vitro* studies to determine whether lentivirus-miR-33 overexpression would affect alveolar macrophage lipid transporters. Results confirmed that miR-33 overexpression repressed both ABCA1 and ABCG1 in cultured primary murine alveolar macrophages. Subsequent evaluation of BAL cells from sarcoidosis patients compared to healthy controls also revealed elevated miR-33 (5 fold) and reduced ABCA1 (-4.3 fold) and ABCG1 (-3.4 fold). **Conclusions:** Findings suggest that alveolar macrophage miR-33 is upregulated by pro-inflammatory cytokines and may perpetuate chronic inflammatory granulomatous disease by repressing anti-inflammatory functions of ABCA1 and ABCG1 lipid transporters.

Notes:

PR9

PREDICTION OF AIRWAY OBSTRUCTION BASED UPON OBSERVATIONS OF THE UPPER AIRWAY DURING UPPER ENDOSCOPY

G Harvin, E Ali, A Raina, W Leland, S Abid, Z Vahora, H Movahed, S Kachru, R Tee

Aim: This pilot study examines upper airway characteristics through endoscopy to determine who is at high risk for obstructive sleep apnea.

Material and Methods: Patients undergoing routine upper endoscopy were divided into 2 groups according to the Berlin Questionnaire (high likelihood and low risk for sleep disordered breathing). Patients underwent routine upper endoscopy using propofol sedation. The airway was then evaluated for no collapse, partial collapse, or complete collapse at the levels of the palate/uvula/tonsils, the tongue base, the hypopharynx, and the larynx. They were given a score of 0 for no collapse, 1 for partial collapse, and 2 for complete collapse. The score for each of these levels was added to give a total score or severity index. The larynx was also evaluated for lateral pharyngeal collapse (minimal, up to 50%, >50%, or 100%).

Results: We found that patients with a partial obstruction at the level of the palate/uvula/tonsils, tongue base, hypopharynx, or larynx, or complete obstruction at any level were more likely to have a positive Berlin questionnaire. These did not reach statistical significance. Patients with a positive Berlin questionnaire were more likely to be of increased weight (mean 197lbs vs mean 175lbs, $p=0.19$), increased BMI (31.2kg/m² vs 27.42kg/m², $p=0.11$), increased neck circumference (36.7cm vs 34.7cm, $p=0.23$), and have a higher total airway score (2.61 vs 1.67, $p=0.09$), although these were not statistically significant. .

Conclusions: The results of our pilot study represent preliminary data supporting airway observations during upper endoscopy to help predict patients at high risk for sleep apnea.

Notes:

PR10

PLASMA EXCHANGE TAPER FOR ACQUIRED TTP IS PROTECTIVE AGAINST RECURRENCE AT BOTH 30 DAYS AND 6 MONTHS: A RETROSPECTIVE STUDY FROM 2 ACADEMIC MEDICAL CENTERS

P Chae, J Raval, Y Park, D Liles, M Mazepa

Background: Acquired Thrombotic Thrombocytopenic Purpura (TTP) is a hematologic disorder characterized by microangiopathic hemolytic anemia and thrombocytopenia, frequently accompanied by ADAMTS13 deficiency from inhibiting and/or clearing antibodies. We hypothesized that tapering plasma exchange would protect against recurrence at 30 days but likely only delay recurrence, and thus by 180 days recurrence rates would not differ.

Methods: Subjects were identified from previously established acquired TTP registries at two academic medical centers: one where TPE is nearly universally tapered and one where TPE is never tapered. For each TTP episode, immunosuppression therapy, time to disease recurrence or death, and central venous catheter infections from each center were recorded. In order to control for the effect of immunosuppression, prednisone-treated episodes were analyzed separately from rituximab-treated episodes. Kaplan-Meier curves were created for each unique group and Log-rank test was used to compare them.

Results: At 30 days, 46 of 52 tapered episodes (88%) treated with prednisone were free of recurrence versus 31 of 56 episodes (54%) without a TPE taper. Recurrence-free survival at 180 days was 71% (37/52) for episodes treated with prednisone and TPE taper versus 46% (26/57) without a taper. For rituximab-treated episodes, 21 were tapered and 38 were not. At 30 days, 20 of 21 tapered episodes (95.2%) treated with rituximab were free of recurrence versus 31 of 38 episodes (81.6%) treated with rituximab without a plasma exchange taper. Recurrence-free survival at 180 days was 90% (19/21) for episodes treated with rituximab and plasma exchange taper versus 76% (29/38) treated with rituximab without a taper.

Conclusions: In this analysis, we found that after a treatment response using prednisone and TPE, there was a highly significant difference in recurrence rate at 30 days without a TPE taper, which was an expected finding. However, at 180 days, the difference between the groups persisted, which was unexpected. The benefit of tapering TPE when treating with rituximab is less clear. Catheter-related infections were also higher in the taper group, indicating that the taper should be used parsimoniously.

Notes:

PR11

ANALYSIS OF MORTALITY FOLLOWING CURATIVE THERAPY FOR HEAD AND NECK CANCER

M Navaid, P Lepera, J Rosenman

Background and Objectives:

Interdisciplinary treatment of patients with head and neck cancer result in improved cure from malignancy but risk for severe late toxicity which may impact on patient survival years following curative therapy. Published reports on the delayed toxicity of curative therapy for head and neck cancer is an important area for clinical investigation and may lead to improvement in medical management following therapy for head and neck cancer.

Methods:

The survival of patients treated at East Carolina University for head and neck cancer between years 2001 and 2015 were compared with age matched peers.

Results:

In our center over a 14 year period, 1334 patients were treated for head and neck cancer. The median age is 62 years. For 1334 patients, the hazard rate for mortality is 23% per year for the first 18 months, 10% years for the next 8 years and then 7.5% after 10 years. This is twice as high as the normal population whose HR is 2.5%.

Conclusions:

Morbidity following curative treatment of head and neck cancer is a timely and important area for clinical investigation (1). Our group will proceed with comparative analysis of operative patient subsets and cancer specific survival for clinically similar patient subsets. We will report on a matched pair analysis of all patients who had surgery alone, surgery plus radiation and surgery plus chemoradiation. The analysis of all patients eligible for surgery selects patients of good health and is a strong clinical indicator of initial health status. In addition, we will match patient age, tumor site and stage as our matched pair variables.

1. Forastiere NEJM 2003 Nov27;349(22):2091-8

Notes:

PR12

HIGH ADHERENCE TO ORAL MEDICATIONS AMONG HEMATOLOGY PATIENTS IN A RURAL COMMUNITY-BASED HOSPITAL NETWORK

DK Liles, CS Lea, TN Moore, B Dangott, L Stewart, C Passwater, C Knupp

Background: In patients with Multiple Myeloma (MM) and Chronic Myeloid Leukemia (CML), lack of medication adherence is related to poor therapeutic response. Compliance may be influenced by treatment beliefs, behavior choices, or patient barriers. We sought to understand patient compliance in a predominantly African American (AA) patient population in a rural community-based hospital network.

Methods: The validated Ask®-12 survey was offered to 42 MM and CML patients seen within three community-based oncology clinics affiliated with an academic medical center during routine visits from March to October 2015. The survey was comprised of three sections: inconvenience/forgetfulness, treatment beliefs, and behavior. Patients responded using a Likert scale ranging from 'in the last week' to 'never'. 'Never' indicated most adherent. 'In the last week' indicated least adherent. Data based upon NCCN guidelines were collected for each participant and analyzed in SPSS.

Results: Baseline results are reported for five behavior questions from 30 MM and 12 CML patients. With 31 (76%) AA participants, 23 women, and 19 men completing the survey. Limited compliance differences were found by cancer type. Median years since diagnosis among MM and CML patients were two and two and a half years, respectively. MM patients were older than CML patients (median 63 and 48, respectively). In at least 69% of respondents, behavioral factors were not a barrier to adherence. Cost was the least reported reason for non-compliance. Adherence was lowest when medicine was not physically available, suggesting most intended to take their medicine, but were unable to, which was consistent with taking medicine "more or less than prescribed."

Conclusions: High adherence to oral medications was found. Cost was not a barrier. Provider improvements may include presenting strategies to help patients to take medications at the prescribed time.

Notes:

PR13

GENETIC RISK ASSESSMENT FOR BREAST CANCER: IMPACT OF RACE AND SOCIOECONOMIC STATUS.

N Lawing, J Hildebrand, M Muzaffar

Background: The National Comprehensive Cancer Network (NCCN) has set forth guidelines for identifying patients at increased risk of hereditary cancer or genetic assessment, counseling and testing if indicated. For patients with mutation, risk reduction strategies can lower risk of certain cancers substantially. We present our data for genetic risk assessment experience for high risk breast cancer at Leo Jenkins Cancer Center (LJCC).

Methods: An IRB approved retrospective chart review of breast cancer patients treated at LJCC between 2007 and 2014 was undertaken. Patients meeting NCCN criteria for genetic risk evaluation were identified and charts reviewed for data collection. Categorical variables were compared with chi-square and multivariate analysis was performed.

Results: From 2007 to 2014, 968 breast cancer patients were treated at LJCC, 49.0% of the patients were AA and 47% were non-Hispanic. 46.2% (n=446) patients met NCCN criteria for genetic risk assessment. Of those who met criteria, only 59.6% (n=266) were referred and 45.7% (n=204/446) underwent genetic counseling. Reasons for not undergoing counseling after referral were largely undocumented (66.7%, n=41, p<0.0001). African Americans and Hispanics were more likely to meet criteria based on personal diagnosis alone, especially triple negative breast cancer at age ≤ 60 yrs. among AA females. (p<0.0001). For those who underwent counseling and genetic testing was recommended, 81% received testing. Financial barrier (81.8%) was the most common reason for not undergoing testing (p<0.0001). Patients living in counties with a higher median household income were more likely to attend genetic counseling compared to those in the lower income (32.5% vs 51.4%). (p=0.0209).

Conclusion: This study highlights the underutilization of genetic risk assessment in a very high risk population of breast cancer. African American patients with breast cancer have high likelihood of meeting genetic risk assessment criteria based on personal history alone. Lack of provider recognition for genetic assessment need and financial reason were main reason for lower risk assessment and testing. We intent to utilize electronic health record, provider education and our nurse navigation program to improve genetic risk assessment at our center.

Notes:

PR14

IDENTIFYING HIGHLY ACTIVE ANTIRETROVIRAL THERAPY RELATED MEDICATION ERRORS AT VIDANT MEDICAL CENTER

M Mehta, N Nicolsen

Background: Highly active antiretroviral therapy (HAART) for individuals infected with human immunodeficiency virus (HIV) is specialized and complex, resulting in a high potential for medication errors. Many healthcare workers have little experience with HAART and difficulty detecting these errors when they occur. The objective of this research was to determine if there is a need for additional review of HIV patient medication profiles during admission.

Methods: University Health Consortium (UHC) clinical database resource manager was utilized to generate a list of adult patients admitted to Vidant Medical Center (VMC) from March 2015 to September 2015 with an ICD-9 code for HIV (042). Medication errors were identified via retrospective chart review using the electronic medical record (Epic). Drug interactions were limited to four predetermined important interactions. The primary endpoints were total number of HAART related medication errors and total number of admissions with errors. Secondary endpoints included types of errors, assessment of medication reconciliation, and involvement of the East Carolina University (ECU) infectious disease division.

Results: This study found a total of 41 HAART related medication errors with 42.1% (24/57) of admissions having errors. The majority of errors were due to drug-drug interactions (46.3%) followed by medication reconciliation errors (19.5%) and protease inhibitor and ritonavir timing mismatches (17.1%). Of the 20 errors with the potential to be corrected, 15 (75%) remained undetected. Infectious disease was consulted on approximately half of all HIV admissions (48.8%).

Conclusions: These results identified multiple opportunities to optimize the care of hospitalized HIV positive adults at VMC. Strategies to reduce HAART related medication errors include infectious disease pharmacist or physician review of HIV patient medication profiles, HIV specific medication reconciliation education for pharmacy technicians, changes in Epic (including protease inhibitor and ritonavir timing and updating drug interaction alert flags), and education of pharmacy and physician staff with dissemination of HAART related reference guides.

Notes:

PR15

DETECTION OF LIVESTOCK-ASSOCIATED STRAINS OF METHICILLIN-RESISTANT *STAPHYLOCOCCUS AUREUS* AMONG NASAL ISOLATES OF PATIENTS IN EASTERN NORTH CAROLINA

KL Augustino, BJ Feingold, P Udani, KM Ramsey

Background and Objectives: Community acquired Methicillin-resistant *Staphylococcus aureus* (MRSA) has been a major contributor to human disease, from cellulitis-to-fatal infections, in the US. In parallel, strains of MRSA were detected among livestock in the Netherlands, termed livestock associated MRSA (LA-MRSA), with strain types genetically distinct from those seen in humans. Detection of these types require Multilocus Sequence Typing (MLST) or whole genome testing, both of which require considerable time and expense. As a number of our patients live in livestock dense areas, we hypothesized that there may be livestock-associated strains of MRSA among our patient's nasal isolates.

Methods: Nasal isolates of MRSA from among patients admitted to VMC during February 2007-2009 were tested for their genotypes in the VMC Infection Control lab using the Diversilabs rep-PCR typing method. The patient charts were reviewed for risk factors for MRSA and demographic data, including their home zip codes. These zip codes were compared with geospatial mapping of areas of Eastern NC with high density of livestock. A group of 12 isolates among the "non-typeable" group (ie, non-USA types) were selected from patients living in livestock-dense areas, and sent for MLST to detect livestock-associated strains.

Results: From among the MRSA nasal isolates, the genotyping revealed the following nontypeables: February 2007 (n = 91): Non-typeable (12%); for 2008 (n=133): Non-typeable (15%), and for 2009 (n=120): Nontypeable (14%). Among the 12 nontypeable isolates sent for MLST typing, 3 were the human and LA- MRSA strain ST5, and 1 was LA-MRSA ST 398.

CONCLUSIONS: 1) Four livestock associated MRSA were detected among our patient populations in Eastern NC. 2) This is one of the first reports of identification of MST-5 and MST-398 genotyping via the Diversilabs genotyping system, which may provide a rapid and less expensive method of screening for these LA-MRSA strains.

Notes:

PR16

REMOTE ANTIMICROBIAL STEWARDSHIP IN COMMUNITY HOSPITALS

Z Wood, N Nicolsen, N Allen, P Cook

Background: Antimicrobial stewardship has become standard practice at university medical centers, but the practice is more difficult to implement in remote community hospitals that lack infectious diseases trained practitioners. Starting in 2011, six community hospitals within the Vidant Health system began an antimicrobial stewardship program utilizing pharmacists who reviewed charts remotely from Vidant Medical Center. Pharmacists made recommendations within the electronic medical record (EMR) to streamline, discontinue, or switch antimicrobial agents.

Methods: Totals of charts reviewed, recommendations made, recommendations accepted, and categories of intervention were recorded. Linear regression was utilized to measure changes in antimicrobial use over time.

Results: For the four larger hospitals, recommendations for changes were made in an average of 45 charts per month per hospital. Physician acceptance of the pharmacists' recommendations varied between 83-88%. Decrease in total antimicrobial use was not statistically significant, but included antimicrobial use outside of the stewardship program's review. Quinolone use decreased by more than 50% in two of the four larger hospitals.

Conclusion: Remote antimicrobial stewardship utilizing an EMR is feasible in community hospitals and is generally received favorably by physicians. As more community hospitals adopt EMRs, there is an opportunity to expand antimicrobial stewardship beyond the academic medical centers.

Notes:

PR17

PROPOSED MODEL FOR THE CARE OF HOSPITALIZED PERITONEAL DIALYSIS PATIENTS

CR Christiano, MI Hames, P Jawa, PJ Hughes, MH Locklear

Background: Peritoneal dialysis (PD) has been prescribed throughout the United States, yet the optimal model of care for hospitalized PD patients remains unknown. With a growing interest in home modalities and emphasis on quality, it is imperative that we identify an effective and efficient way to care for this patient population during hospitalization.

Methods: We describe a model successfully implemented at Vidant Medical Center (VMC) in 2008. Prior to this date, the primary hospital nurses performed PD care. Due to the high risk, low volume nature of inpatient PD, this resulted in inconsistent care as well as decreased physician, nursing, and patient satisfaction. In 2008, an inpatient PD nursing team was created. This team, consisting of nephrology nurses with specialized PD training, is managed by VMC's self-maintained dialysis unit. Staffed with 2 nurses during the day and 1 at night, they provide 24/7 care throughout the hospital, including the ICU and ED. Responsibilities include patient education, exit site care, catheter flushes, and all manual and automated PD exchanges. Upon discharge, the outpatient unit is contacted to ensure appropriate transition back to the outpatient setting.

Results: This model provides several benefits: 1) PD treatments are consistently completed and charted, 2) Increased physician, nursing, and patient satisfaction, 3) Continuity of care, and 4) Cost reduction (personnel and supplies). Since inception, this team has grown to 13 nurses. During FY2014, 2568 (1572 adult / 996 pediatric) PD treatments were performed, the majority CAPD. To ensure appropriate utilization of nursing resources, most are cross-trained to perform hemodialysis.

Conclusions: In conclusion, the creation of a specialized nursing team has been instrumental in optimizing the care of our hospitalized PD patients. This sustainable model provides effective, efficient care and should be considered for implementation by hospitals providing PD services.

Notes:

PR18

QUANTIFYING THE GENDER REIMBURSEMENT GAP IN NEPHROLOGY

S Ali, X Fang, P Jawa, TP Desai

Background: The 2015 Medscape Compensation Report suggests that female providers earn less than male providers but the sample size was 19,657; only 1% Nephrologists. To analyze the financial disparities, we compared total Medicare reimbursements paid to males and females.

Methods: We obtained reimbursement data from 2014 Medicare Fee-For-Service Provider Utilization and Payment Data Physician Public Use File. We consolidated all reimbursements by NPI number and categorized them by specialty and gender. We adjusted reimbursement differentials against the number of Medicare beneficiaries seen and services provided. We used linear regression models to compare reimbursements collected by male and female providers. Differences in reimbursement are negative unless otherwise listed and 95% confidence intervals were calculated.

Results: We analyzed 246,996 providers in 13 specialties; 3% were Nephrologists. Female Nephrologists were reimbursed less \$41,776.96 (unadjusted); the 6th worst reimbursement differential. In the adjusted analysis, female Nephrologists had the worst reimbursement differential: less \$17,971.66. Moreover, in 11 of the 13 specialties analyzed, female physicians had a statistically lower reimbursement rate than their male counterparts.

Conclusion: When adjusted for the number of beneficiaries seen and services provided, female Nephrologists endure the largest reimbursement gap by gender in any specialty. This gap should be followed yearly and steps should be considered to help close this gap.

Notes:

PR19

AN OBSERVATIONAL ANALYSIS OF OFFICE BASED MICROSCOPY

K Liner, C Phillips

Background: KOH tests, Gram stains, Scabies preps, and Tzanck smears are common laboratory tests that are performed in the dermatology clinic to help determine the etiology of a skin disorder. These tests are quick, inexpensive, and provide valuable information for physicians. A positive test may uncover the underlying diagnosis and a negative test may redirect focus to non-infectious causes. For KOH and Scabies preps, our clinic was interested in the frequency of testing and number of positive tests. For Gram stains and Tzanck smears we were interested in the frequency of testing and the breakdown of cells and/or organisms.

Methods: The number of patients seen in an academic dermatology clinic between June 2013 and June 2015 was verified using the electronic medical record. The number of KOH, Gram stains, Scabies preps, and Tzanck smears was recorded from logbooks. KOH and Scabies preps were reported as either positive or negative. Gram stains were totaled and divided into 5 groups: gram +, gram -, mixed, fungi, and negative. Tzanck smears were totaled and divided into 4 groups: MNGCs, eosinophils, molluscum, and negative. The data was recorded and analyzed using an excel spreadsheet.

Results: KOH preps were the most common test performed (63%) followed by the Gram stain (22%). The KOH test was performed on 4% of all patients and 22% were positive. Tzanck smears and Scabies preps were each performed on <1% of patients. The Scabies prep was positive in 36% of those tested. A negative result (no organisms) was the most common finding of the Tzanck smear (46%) followed by MNGCs (25%). Gram positive organisms were the most common finding of the Gram stain followed by negative (no organisms), mixed, fungi, and gram negative organisms.

Conclusions: Given the high prevalence of superficial fungal infections, it is not surprising the KOH prep was the most commonly utilized microscopy test with fungal elements identified in 22%. The Scabies prep was performed on <1% of patients and had the highest positive result of all tests (36%). In contrast, the Tzanck smear while also performed on <1% of patients was negative for cells and organisms in >40% and positive for MNGCs in 25%. The Gram stain revealed gram positive organisms in approximately 80% of tests. Gram negative organisms were infrequently isolated, likely a representation of the majority of skin and soft tissue infections being caused by gram positive organisms such as *S. aureus* or *S. pyogenes*

Notes:

PR20

GLIMEPIRIDE VERSUS GLIPIZIDE AS ADD-ON THERAPY TO METFORMIN IN TYPE 2 DIABETES MELLITUS. A POST-HOC META-ANALYSIS

BM Mishriky, DM Cummings, RJ Tanenberg

Introduction: We recently published a meta-analysis comparing Dipeptidyl peptidase-4 inhibitors (DPP-4i) to Sulfonylurea (SU) as add-on therapy to metformin in Type 2 diabetes mellitus (T2DM) [1]. We concluded that while both SU and DPP-4i caused a reduction in hemoglobin A1c (A1c), SU caused more hypoglycemia and weight gain. While cost-effective studies favored DPP-4i in insured patients; the much cheaper price of SU may still favor this class in non-insured patients. We performed a post-hoc analysis to evaluate the efficacy of SU subclasses compared to DPP-4i as an add-on therapy to metformin in T2DM.

Methods: We used data from our previously published meta-analysis [1]. A sensitivity analysis was performed by restricting the analysis to specific SU agents compared to DPP-4i. Number needed to harm (NNH) was calculated for hypoglycemia.

Results: On restricting the analysis to glimepiride (ten studies), there was a statistically significantly greater A1c reduction at 12, 52, and 104 weeks favoring glimepiride compared to DPP-4i (Mean Difference (MD) [95% Confidence Interval (CI)] = 0.23% [0.08, 0.38], 0.15% [0.02, 0.28], and 0.17% [0.06, 0.27] respectively). However, hypoglycemia at 12, 52, and 104 weeks was significantly higher with glimepiride compared to DPP-4i (NNH = 8, 7, and 5 respectively). On restricting the analysis to glipizide (five studies), there was a greater short-term reduction in A1c favoring glipizide; however, this did not persist at 52 weeks where results became non-significant or at 104 weeks where results favored DPP-4i (MD [95% CI] = 0.08% [0.02, 0.14], -0.01% [-0.08, 0.06], and -0.08% [-0.15, -0.01] respectively). Hypoglycemia was significantly higher at 52 and 104 weeks with glipizide compared to DPP-4i (NNH = 4, and 4 respectively).

Limitations: Results from post-hoc and sensitivity analyses need to be interpreted with caution. Another limitation was the limited data for gliclazide.

Conclusion: Compared to glipizide, glimepiride produced more A1c reduction when compared to DPP-4i that persisted over time. The incidence of hypoglycemia was higher with both medications compared to DPP-4i.

Reference: [1] DRCP 2015; (109): 378-88

Notes:

PV1

LOSS OF VISION FOLLOWING TRAUMA. CAN WE SEE IT WHEN PATIENTS CANNOT SEE?

BM Mishriky, S Pancholi, AK Rao

Case presentation: We report a 45-year-old Caucasian female with history of hypertension and migraine headache who was transferred to our facility from an outside hospital (OSH) due to high medical complexity necessitating diagnostic and therapeutic interventions. She was unresponsive at initial presentation to the OSH but had improving alertness after fluid resuscitation. She reported getting into a physical altercation with her father. During the altercation, she was struck in the face and left eye with kitchen utensils.

Apparently, both the patient and her father were unconscious before being found by authorities. Initial physical exam demonstrated slurred speech, proptosis, left facial swelling and droop. Relevant labs showed white blood cell count of 34,700/uL, BUN 61 mg/dL, creatinine 1.98 mg/dL, and negative initial urine drug screen. CT Head was negative for intracranial hemorrhage. An MRI Brain was performed but not interpreted just prior to transfer.

The patient was transferred to our facility 48 hrs after presentation to the OSH. At our facility, the patient's main complaint was a severe 10/10 throbbing headache described as the worst headache of her life. Physical exam revealed the following left eye findings: proptosis, an inability to open the eye lid, loss of extraocular movements, complete loss of vision, and a dilated non-reactive pupil to light. In addition, there was left facial swelling and left facial nerve palsy. No other motor or sensory deficits were noted. Upon patient arrival, the OSH MRI Brain was reviewed with our radiologist and images were concerning for cavernous sinus thrombosis. The diagnosis was confirmed with MRI cavernous sinus. Management plan included starting therapeutic anticoagulation with therapeutic enoxaparin, broad-spectrum antibiotics, and emergent ophthalmology and neurosurgical consultations.

Discussion: Although cavernous sinus thrombosis is rare, it should be part of the differential diagnosis of any headache following trauma that is associated with orbital pain, proptosis, or oculomotor palsies. A high clinical suspicion in the presence of such red flags could be critical in avoiding anchoring and availability heuristics in patients with a history of migraine headache. This case highlights the importance of developing a robust differential diagnoses, effective transitional care during inter-hospital transfer, and avoiding common heuristic barriers that may lead to serious and irreversible consequences if appropriate care is delayed.

Notes:

PV2

RHINO CEREBRAL MUCORMYCOSIS IN PATIENTS WITH DIABETIC KETOACIDOSIS –A DIAGNOSIS WITH HIGH MORTALITY

S Naseer, RJ Tanenberg, S Meharavaran, L Dobbs

Objective: This case discusses diagnostic features and treatment of an uncommon, frequently missed, fatal fungal infection. Predisposing factors are uncontrolled diabetes and diabetic ketoacidosis (DKA)

Case Report: A 36 year old Hispanic male tobacco farm worker with uncontrolled Type 1 diabetes mellitus, initially treated for sinusitis, was later admitted to the hospital with diagnosis of DKA and orbital cellulitis. He noted fever, chills, nausea, fatigue, polyuria, polydipsia, severe frontal headache for 4 weeks, swelling of the right eye for 2 weeks, and acute vision loss. He was alert and oriented with right eye periorbital swelling, significant proptosis, unreactive pupil, total ophthalmoplegia, and conjunctival chemosis. CT scan showed severe R sided orbital cellulitis, ethmoid sinusitis, and large sub periosteal abscess of the orbital cavity, causing proptosis. Labs: Confirmed DKA, A1C-14.3%. WBC 18.8, with neutrophilia. He was treated with IV antibiotics and I&D of the abscess. Surgical pathology revealed fungi with non-septate non-branching hyphae of variable thickness. Post drainage MRI confirmed bony invasion/ destruction of right orbital roof and right ethmoid sinus. CT/ MRI and pathology findings were consistent with invasive fungal infection of Rhinocerebral Mucormycosis (ROCM). He was then treated with IV Miconazole, Liposomal Amphotericin plus tight control of blood glucose. He was discharged after 40 days on oral Posaconazole. Two weeks later, orbital infection and headache were resolving. Right eye blindness was permanent, due to optic nerve ischemia/necrosis/atrophy.

Discussion: Mucormycosis is a rare, lethal infection, caused by the filamentous fungi class of Zygomycetes order Mucorales. Common species (*Rhizopus Oryzae*) causing ROCM are found in decaying food, soil, or other organic matter. Inhaled fungal Sporangiospore infect the paranasal sinuses rapidly extending into adjacent tissues. Angioinvasion, vessel thrombosis, and tissue necrosis are the key for factors for complications. Patients with DKA, severe hyperglycemia and acidosis have impaired neutrophil chemotaxis and phagocytic activity. Zygomycetes scavenge iron from the host to grow. Iron becomes available as acidosis releases FE⁺ from binding protein. **Conclusion:** 83% of ROCM cases have diabetes usually with DKA. Given the 44% mortality rate, early diagnosis is imperative. Clinicians should be alert to important clinical signs like headache and eye pain in patients with uncontrolled diabetes and DKA and those who are immunocompromised.

Notes:

PV3

REMISSION OF TYPE B INSULIN RESISTANCE ACHIEVED WITH IMMUNOSUPPRESSIVE THERAPY

J Giordano, SF Lin, M Javaid, MS Kalia-Reynolds, BE Ramirez, E Treadwell, AJ Drake, RJ Tanenberg, C Houston, FJ Cook

Learning Objectives: (1) Recognize that type B insulin resistance (TBIR) is a rare syndrome in which autoantibodies block the insulin receptor and lead to extreme insulin resistance. (2) Understand that patients with TBIR may present with an underlying rheumatologic disease, rapidly progressive diabetes mellitus refractory to massive doses of insulin, weight loss, acanthosis nigricans, and hyperandrogenism. (3) Know that immunosuppressive treatment may induce remission of TBIR.

Case Information: A 68 year old African American female presented with 70-lbs unintentional weight loss, recurrent pancreatitis, and rapidly worsening hyperglycemia (increase of Hgb A1c from 6.8% to 11.1% over 2 months). She also developed painful parotid gland enlargement and underwent parotidectomy. Postoperatively, IV insulin was initiated for treatment of severe hyperglycemia, which remained uncontrolled despite greater than 1,500 units daily. Exam revealed cachexia (BMI 16), acanthosis nigricans, patchy alopecia, and facial hirsutism. Labs showed pancytopenia, positive ANA, positive anti-SSA antibody, low serum C3, and elevated ESR and CRP. A diagnosis of mixed connective tissue disorder was made. The combination of autoimmune disease and severe insulin resistance raised suspicion for TBIR. Expert analysis revealed strong positivity for insulin receptor antibodies. Treatment was initiated with daily cyclophosphamide and pulses of rituximab (NIH/NIDDK Study Protocol 76-DK-0006). After two cycles of treatment, her insulin requirement dissipated and her diabetes was controlled without medication. She was transitioned to oral azathioprine and within one year, the patient is now in remission with euglycemia and normal fasting insulin levels.

Summary: The rarity of Type B insulin resistance has precluded controlled trials, and therapy has not been standardized. The NIH has described a limited number of patients treated prospectively with rituximab and cyclophosphamide who all achieved remission. Our report describes a patient treated with this regimen outside of the NIH, and lends further credence to the use of combined rituximab/cyclophosphamide in the treatment of this condition.

Notes:

PV4

EUGLYCEMIC DIABETIC KETOACIDOSIS AS A COMPLICATION OF SODIUM-GLUCOSE COTRANSPORT (SGLT-2) INHIBITORS USE IN DIABETIC PATIENTS

SF Awadallah, S Wasim, P Kaur, RJ Tanenberg

Learning objectives: The purpose of this presentation is to describe the association of Sodium–Glucose cotransporter 2 (SGLT-2) inhibitors use with the development of euglycemic Diabetic Ketoacidosis (euDKA).

Case Information: A 24 years old caucasian male with past medical history of type 1 diabetes mellitus presented with nausea, vomiting, and abdominal pain for one day. Home diabetic regiment included Insulin glulisine (APIDRA) pump, metformin 1000 mg twice daily, and recently started canagliflozin (INVOKANA) 100 mg daily. He denied chest pain, fever, or urinary symptoms. He reported consuming five heavy liquor drinks the night before his presentation.

Laboratory evaluation in the emergency department revealed an anion gap of 28 mEq/L, blood glucose of 206 mg/dL, venous pH of 7.19, bicarbonate of 13 mEq/L, beta-hydroxybutyrate of 80 mmol/L, sodium of 138 mmol/L, and serum creatinine of 1.13mg/dL. He was treated with intravenous fluids, insulin, and glucose, and the euDKA resolved over 24–36 hours. He was transitioned to subcutaneous insulin and discharged home in stable condition on his home regiment but with the discontinuation of canagliflozin.

Summary: Diabetic ketoacidosis (DKA) is a well-recognized complication type 1 diabetes. DKA is traditionally defined by the triad of hyperglycemia >250 mg/dL, anion-gap acidosis, and increased plasma ketones. EuDKA is defined as DKA without marked hyperglycemia.

SGLT-2 inhibitors seem to be associated with euglycemic DKA and ketosis. The mechanism is not fully understood but is likely related to their noninsulin-dependent glucose clearance, hyperglucagonemia, and volume depletion. Patients with type 1 or type 2 diabetes whom present with nausea, vomiting, malaise or develop metabolic acidosis in the setting of SGLT-2 inhibitor therapy should be promptly evaluated for the presence of urine and/or serum ketones thus allowing recognition of DKA and the initiation of appropriate.

Notes:

PV5

XIC PERIODIC PARALYSIS: CHALLENGING DIAGNOSIS IN A CASE WITH MIXED ETHNICITY

MR Azad, FJ Cook, S Boyapati

Learning objective: Recognition of patients with Thyrotoxic Periodic Paralysis (TPP), including those with apparently low epidemiological risk
Case Information: 27 yo African American (AA) Female with no significant past medical history presented with acute onset of profound lower extremity (LE) weakness with inability to walk. She had previously been seen for intermittent LE weakness and was diagnosed with hypokalemia and sent home on oral potassium (K). She reported recent 30 lb weight loss, fatigue, and heat intolerance. Examination revealed tachycardia, tremor, mild thyromegaly with a bruit, significant bilateral LE weakness, diminished LE reflexes and LE edema. Laboratory data included K 2.3 mg/dL TSH < 0.01 uIU/mL, free T4 7.4 ng/mL, free T3 16.3 pg/mL. EKG showed sinus tachycardia. She was treated with potassium IV and PO for 48 hours and was started on propranolol and Methimazole (MMI). Thyroid stimulating immunoglobulin was 219% baseline (normal<140). On outpatient follow up 3 weeks later, LE strength was 4+/5 and free T4 was 1.79 and K 3.7 on propranolol and MMI. At that time additional history revealed some Native American ancestry.

Summary: TPP is characterized by severe hypokalemia with muscle weakness associated with thyrotoxicosis and is due to intracellular influx of potassium in response to beta adrenergic activity. Nonselective β -adrenergic blockers can prevent recurrence of the paralytic attacks. The episodic paralysis remits with control of hyperthyroidism. A strong genetic predisposition has been assumed due to Asian racial preference (1.8-1.9% of thyrotoxic Asians compared to 0.1-0.2% of thyrotoxic North Americans). Association has been found between TPP and the KCNJ2 gene which encodes a K channel. Unlike thyrotoxicosis, which is 9 fold more common in females, TPP occurs 6-20 fold more commonly in males. Only two cases have been reported in AAFs. TPP has been reported to be more common in Native Americans (NA) than in Caucasians or AAs. There is evidence that NAs and Asians have common ancestry due to migration of humans from Asia to North America 11000-23000 years ago. Our patient's expected low risk for TPP as an AAF was likely influenced by her NA ancestry, giving credence to a genetic susceptibility of the patient for the condition.

Notes:

PV6

PANHYPOPITUITARISM ASSOCIATED WITH A GIANT PARASELLAR CAROTID ARTERY ANEURYSM

FE Bautista Vitiello, AJ Drake III, FJ Cook

Learning Objective: Hypopituitarism has an estimated prevalence of 1/2200, an annual incidence of 4.2/100,000 and is most commonly caused by adenomas and their treatment (hypophysectomy or radiation therapy), or by hypothalamic or parasellar tumors or metastatic carcinoma. Together, these tumors account for 90% of cases. We present a case and MRI images of a giant ICA aneurysm with findings of panhypopituitarism.

Case Information: A 50 y/o female with PMH of post-surgical hypothyroidism presented to her ophthalmologist with blurry vision and diplopia due to left 6th cranial nerve palsy which did not improve on prednisone given for presumed Graves' ophthalmopathy. In the following 2 months she developed headache, nausea/vomiting and dizziness. On MRI she was found to have an unruptured 26 mm left cavernous sinus carotid artery aneurysm. High dose dexamethasone was started and she underwent successful Pipeline Device insertion. She was discharged on a 2 week steroid taper. Three weeks after discharge she was readmitted with DVT and PE. She developed shock, requiring transfer to ICU. Cortisol was 5.2 mcg/dL at baseline and 8.8 mcg/dL 60 min after cosyntropin stimulation (nl>18 mcg/dL). The patient clinically improved on stress dose hydrocortisone. She was discharged on replacement hydrocortisone, but had to be readmitted to hospital with adrenal crisis after she was taken off hydrocortisone by her doctor. While off hydrocortisone and on thyroxine, her testing was consistent with panhypopituitarism with random cortisol 1.2 ug/dL, ACTH <5 pg/mL, TSH <0.02 uIU/mL, free T4 1.23 ng/mL, prolactin <0.7 ng/mL, FSH 1.4 mIU/mL, estradiol 13 pg/mL, and IGF-I <16 ng/mL. She responded well to re-initiation of corticosteroid replacement.

Summary: Cerebral aneurysm is a rare cause of panhypopituitarism, responsible for less than 0.2% of cases. There are only 40 reported cases in the literature to date. Patients usually manifest neurological and visual defects. Pituitary dysfunction due to an ICA most frequently involves the pituitary-gonadal axis (67.5 %) followed by pituitary-adrenal (48.6%) and pituitary-thyroid (40.5%). Diabetes insipidus is rare. In the presence of supra- or para-sellar carotid artery aneurysm, hypopituitarism should be suspected, especially when accompanied by neurological and visual defects.

Notes:

PV7

X-LINKED HYPOPHOSPHATEMIA PRESENTING AS SEVERE HYPOPHOSPHATEMIA IN ADULthood

BF Ramirez, S Mumm, FJ Cook, MP Whyte

Learning Objective: Heritable hypophosphatemic rickets (HR) includes X-linked (XLHR), autosomal recessive (ARHR), and autosomal dominant (ADHR) types. Of these, only especially rare ADHR is likely to present in adulthood; however, here we show that XLHR may also rarely present later in life.

Case Information: A 38 year old previously healthy farmer presented to the hospital with weakness, bradycardia, dyspnea, and hypoxemia upon exertion. Serum inorganic phosphate (Pi) was 1.0 mg/dL (normal 2.4-4.7mg/dL), and fractional excretion of Pi was 35% and 70% based on 2 separate 24 hr. urine collections (normal 5-20%). Circulating FGF23 was 106 RU/mL (<180 RU/mL). Serum Pi had been low at 1.6 mg/dL when admitted 2 years previously for hip replacement following a traumatic injury. He was given IV Pi acutely but then required oral Pi and calcitriol for recurrent symptomatic hypophosphatemia. Physical exam was unremarkable except for height of 63 in. Evaluation for tumor-induced phosphaturia was negative, including FDG-PET CT and octreotide scans. Due to short stature and mild hypophosphatemia in his daughter, a genetic cause was considered. However, commercial testing for mutations in the FGF-23 gene (ADHR), DMP 1 gene (ARHR), and PHEX gene (XLHR) were negative. Research analysis revealed the novel PHEX 3'-UTR mutation (c.*231A>G near the polyadenylation signal), which was recently reported (Mumm et al). This is associated with a mild HR phenotype that can masquerade as sporadic HR or XLHR, explained by an ancient common founder in the Midwest, USA.

Summary: Genetic hypophosphatemia can present in adult life. Our patient likely has had lifelong mild hypophosphatemia, perhaps uncovered by acute respiratory alkalosis. His genetic testing has implications for his two daughters who will be carriers of the X-linked mutation, and for any sons of his daughters who will carry the gene defect.

Notes:

PV8

PANCREATIC NEUROENDOCRINE TUMOR PRESENTING WITH MINERALOCORTICOID EXCESS

BF Ramirez, A Raina, S Patel, E Zervos, AJ Drake

Learning Objective: Recognize that pancreatic neuroendocrine tumors (pNETs) are rare (< 1 case per 100,000 per year) and can secrete a variety of peptide hormones including ACTH, which may result in a clinical presentation suggestive of mineralocorticoid excess.

Case Information: 63 year old female was admitted with hypokalemia following a two month history of confusion, edema, hypertension, central weight gain, and new onset diabetes mellitus. Physical exam revealed hypertension (169/88 mmHg), facial hyperpigmentation and hirsutism, central obesity, and lower extremity pitting edema. Serum potassium was 2.2 mEq/L, HCO₃ >40 mEq/L, glucose 265 mg/dL, and HgA1C 7.4%. The patient was clinically suspected to have mineralocorticoid excess. Plasma renin was undetectable, but serum aldosterone was also undetectable. Random serum cortisol and serum adrenocorticotrophic hormone (ACTH) were significantly elevated at 93.9 ug/dL and 523 pg/mL (Ref.6 – 50 pg/mL) respectively. 8 mg of dexamethasone did not suppress AM cortisol secretion (95.5 ug/dL), suggesting an ectopic source of ACTH. Corticotrophin releasing hormone (CRH) stimulation did not result in further increase in ACTH or cortisol, confirming an ectopic source of ACTH. CT revealed a 2.5 cm pancreatic tail mass and thickening of both adrenal glands. A fine needle aspiration of the pancreatic mass yielded tumor cells which stained positive for chromogranin and ACTH, consistent with a well differentiated neuroendocrine tumor. The patient underwent distal pancreatectomy with subsequent resolution of edema, and improvement of hypertension and diabetes.

Summary: Ectopic ACTH production is an uncommon but important cause of apparent mineralocorticoid excess. The very high cortisol concentration overwhelms the capacity of the 11-beta-hydroxysteroid dehydrogenase enzyme that converts cortisol to inactive cortisone. Renal mineralocorticoid receptors are thus exposed to and stimulated by the excess cortisol, leading to apparent mineralocorticoid excess. Localization and removal of the source of ACTH production is paramount to successful treatment of this disorder.

Notes:

PV9

INSULIN EDEMA AND TREATMENT-INDUCED NEUROPATHY IN A TYPE 1 DIABETIC WITH BODY DYSMORPHIC DISORDER

K Sheth, C Houston

Learning Objectives: (1) Recognize the potential complications of rapid correction of longstanding hyperglycemia. (2) Identify patients at greatest risk for insulin edema and treatment-induced neuropathy. (3) Know how to treat and prevent these syndromes.

Case Information: A 24 year old female with type 1 diabetes had experienced poor glycemic control (A1c > 10%) for many years owing to body dysmorphic disorder. She consistently administered her basal insulin but did not take prandial insulin as she was fearful of gaining weight. She was hospitalized with DKA after developing an upper respiratory infection. Following discharge, she became strictly adherent with her insulin regimen and had dramatically improved glycemic control. Two weeks later she presented with progressive generalized edema, 20 lb weight gain, tachycardia, and severe burning pain in her lower extremities. Evaluation of her thyroid, renal, and cardiac function was unremarkable. She was diagnosed with insulin edema and treatment-induced neuropathy. Her glycemic control was liberalized and she was treated with salt/fluid restriction, furosemide, and gabapentin.

Summary: Although the importance of good glycemic control cannot be over-emphasized, clinicians must be wary of the potential complications of rapid correction of longstanding hyperglycemia, including insulin edema and treatment-induced neuropathy. The pathogenesis of these syndromes is not fully understood; however, there may be commonality with refeeding syndrome, as patients with poorly-controlled type 1 diabetes and eating disorders appear to be at greatest risk. Insulin edema may be localized or generalized, is transient, and is usually responsive to salt and fluid restriction. Diuretics may be needed in severe cases. Insulin neuritis is an acute small-fiber neuropathy, likely caused by neuronal edema and ischemia, which causes severe treatment-resistant pain and autonomic dysfunction. Liberalization of glycemic control may hasten the resolution of both syndromes. Identifying those patients most at risk and limiting Hgb A1c reduction to < 2.0% over 3 months may prevent these complications.

Notes:

PV10

ESOPHAGEAL CROHN'S DISEASE

S Durrett, G Kasarala, G Harvin

Learning objective: Crohn's disease most commonly presents with intestinal manifestations. Crohn's disease presenting with esophageal involvement is extremely rare.

Case report: This is a 64-year-old Caucasian woman with past medical history of hypertension and osteoarthritis presented to the hospital with a 30 pound weight loss and fatigue for several months. She was reporting post-prandial epigastric pain and odynophagia that occurs immediately after eating. She had an oral ulcer almost a month before admission. She had no dysphagia or melena. She also noted a change in her stool size and frequency (small and 2-3 times daily). She did not smoke or drink alcohol. Her family history was significant for a mother that died from complications of Crohn's disease.

On exam, she was afebrile and normotensive, with a weight of 51.6 kg and BMI of 19. Abdomen is soft, non-distended, tender to palpation in the left lower quadrant. CT scan of the abdomen and pelvis showed severe wall thickening and peri-colonic inflammation in the sigmoid colon. CT chest demonstrated distal esophagus wall thickening concerning for an ulcer. Upper endoscopy shown a 10cm ulceration in the esophagus with biopsies negative for CMV or HSV or malignancy. The stomach and duodenum were normal. Colonoscopy demonstrated deep ulcers with friable tissue in rectum extending into anal canal. The sigmoid colon was significantly narrowed. Biopsy confirmed Crohn's disease but no evidence of dysplasia or malignancy. She was started on IV SoluMedrol and was transitioned to oral prednisone. At a two-week follow-up, stool was more formed, abdominal pain had resolved. Upper endoscopy 4 weeks later showed her esophageal ulceration had resolved. At sixteen weeks, she developed a colovaginal fistula, and had resection of the sigmoid stricture with a colostomy. She was started on ant-TNF therapy and did well.

Teaching point: Esophageal involvement is one of the rare manifestations of Crohn's disease. The diagnosis should be considered in patients who have other intestinal manifestations of Crohn's disease and present with esophageal symptoms. She had an unusual case in that she presented with esophageal involvement at the time of diagnosis.

Notes:

PV11

HIDRADENITIS SUPPURATIVA WITH ADALIMUMAB: FRIEND AND FOE

G Harvin, G Kasarala

Learning objective: Excess amount of TNF alpha expressed in cells is implicated in the pathogenesis of various autoimmune diseases such as Inflammatory bowel diseases, Psoriasis, Hidradenitis Suppurativa (HS), TNF alpha inhibitors have been used with great Success, but due to the complex interplay of various cytokines have lead to paradoxical exacerbations of Skin lesions while on anti TNF therapy, we are presenting Two Crohn's patient with Paradoxical HS while on Adalimumab Treatment.

Case Report: 57-year-old Female smoker with Fistulizing Crohn's disease started on Adalimumab with good control. 12 months into the treatment, she developed, HS involving the groin; the patient later also developed Psoriasis. Adalimumab was changed to Azathioprine.

24-year-old male with Fistulizing Crohn's disease was being treated with Adalimumab, nine months into treatment, the patient developed HS in bilateral groins. Therapy was changed to Azathioprine.

Teaching Point: Adalimumab is human monoclonal antibody works by disrupting the interaction between the TNF Alpha and its receptors, thereby helping in controlling the autoimmune diseases. However various Paradoxical Dermatological lesions have been reported with their use. Psoriasiform skin lesions is one of the well-recognized adverse effect of TNF inhibitors, TNF alpha inhibition causes unopposed activation of Plasmacytoid Dendritic Cells causing the increased production of Interferon γ -Alpha, which promotes the T cell migration, which causes high levels of interferon γ , leading to increased IL-23 and IL-17. Both the skin lesions of the Psoriasis and HS are found to have higher IL-23. IL-23 has an important role in Th17 development. TH17 cells produces IL-17, that induces production of IL-6, GM-CSF and various essential chemokines involved in mobilization of inflammatory cells. The cytokine profiles of HS, psoriasis, and anti-TNF inhibitor induced psoriasiform lesions are very similar. This opens the possibility that like psoriasis, HS is a paradoxical lesion with anti-TNF therapy, and is perhaps due to a cytokine dysregulation as with Psoriasiform skin lesions. Ustekinumab is an anti-IL-12/IL-23 antibody, which has been used for anti-TNF induced psoriasiform skin lesions and has shown some benefit in CD, can be used in these patients, Hidradenitis suppurativa should be considered as a potential rare paradoxical side-effect of anti-TNF therapy. Genetic polymorphism might explain why only few patients are developing the lesions.

Notes:

PV12

BRONCHOGENIC CYST MASQUERADING AS COPD EXACERBATION

Y Mao, N Gollol-Raju, S Sarwar

Learning Objectives: Bronchogenic cysts are uncommon congenital malformations of the tracheobronchial tree. They are usually detected in infancy or become symptomatic (wheezing, pneumonia) by early adulthood (20's). Symptoms depend on cyst location, which range from cervical, cutaneous, intrapleural, esophageal, cardiac, or rarely retroperitoneal, and can sometimes be misdiagnosed as other entities such as tumors. Here we present a case of bronchogenic cyst diagnosed in a 56 year old male, initially treated for Chronic Obstructive Pulmonary Disease (COPD) exacerbation.

Case Information: A 56 year old male with history of arthritis, 40 pack year smoking history, frequent pneumonias in his 20's, with no cysts on previous X Rays, presented to outside hospital with progressive dyspnea for a month. He reported dyspnea on exertion, wheezing, and increased sputum production, but no hemoptysis. He was initially treated with nebulized bronchodilators, intravenous corticosteroids, and empiric antibiotics.

However, Chest X-Ray showed a large cystic mass in the right hemithorax, which was confirmed on computerized tomography (CT). He was transferred here for surgical excision. However, he was deemed a poor surgical candidate due to severe pulmonary hypertension on echocardiography, with Right Ventricular Systolic Pressure of 78 mmHg. He instead underwent cyst drainage, with chest tube insertion, and chemical pleurodesis. His pleural fluid was a bloody exudate, without evidence of infection or malignancy.

Summary: Bronchogenic cysts, although rare, are the most common congenital malformations of the tracheobronchial tree, with an incidence of roughly 50,000/year. They are usually diagnosed in children; however, some patients can remain asymptomatic for up to two decades. We describe a patient, who has been asymptomatic until his fifth decade, presenting with a large 22 cm cyst, masquerading as COPD exacerbation. Diagnosis is made with CT scan, or surgical excision, and more recently, MRI has emerged as a modality with great accuracy. Surgical excision is the treatment of choice, due to the high risk of recurrence, and a small, 0.7% risk of malignant degeneration. Asymptomatic patients can be treated with either surgery (due to a 45% risk of becoming symptomatic), or with close monitoring. In patients who are not surgical candidates, cyst drainage and chemical pleurodesis is a viable alternative, but recurrence rate is higher than definitive excision.

Notes:

PV13

MARIJUANA: CARDIOVASCULAR IMPLICATIONS OF RECENT LEGAL CHANGES

LW Njoroge, GA Koromia, JR Powell

Learning Objectives: Recent reports have indicated a possible association with atrial fibrillation in young patients without preexisting structural heart disease. We aim to describe a clinical case of paroxysmal atrial fibrillation due to marijuana use.

Case Information: A 22 year old male with a history of recently diagnosed seizures and asthma presented to the hospital after a witnessed seizure. The patient was non-compliant on his anti-epileptic medications and also endorsed daily marijuana use, with the most recent being 7 hours prior to admission. On presentation, he complained of palpitations but denied dizziness or syncope. Physical examination revealed blood pressure of 95/55mmHg and heart rate of 83. An electrocardiogram showed atrial fibrillation with a heart rate of 119 beats per minute. Laboratory results showed normal electrolytes and thyroid function. Echocardiography revealed a structurally normal heart. He was started on a beta-blocker and anticoagulation in preparation for cardioversion; however, the patient spontaneously converted to sinus rhythm after 18 hours of hospitalization. The patient was discharged after 24 hours of admission on Aspirin and low dose beta-blocker with Cardiology follow up arranged.

Summary: Marijuana is the most commonly abused drug in the world and is commonly used for recreational and medicinal purposes. Support for legalization has been increasing in the United States, and twenty-three states and the District of Columbia have decriminalized or legalized its use for medical purposes. Despite its notable benefits, such as antiemesis in chemotherapy, analgesia in chronic pain, and appetite stimulation in HIV/AIDS patients, marijuana has been shown to have adverse effects on the cardiovascular system ranging from postural hypotension to sinus tachycardia and tachyarrhythmias. Eight case reports linking atrial fibrillation and marijuana use reported onset of atrial fibrillation minutes to hours after marijuana use with half the cases resulting in persistent atrial fibrillation, requiring pharmacological cardioversion. Thus, the occurrence of paroxysmal atrial fibrillation in a young patient without structural heart disease should trigger suspicion for marijuana use.

Notes:

PV14

ABNORMAL LIVER ENZYMES IN A MALE PATIENT WITH FRAGILE X: A GUIDE FOR PRIMARY CARE PHYSICIANS

N Jampala, B Mishriky, S Pancholi, K Sheth

Learning objectives: Numerous etiologies can contribute to liver function test (LFT) abnormalities. Autoimmune hepatitis is an inflammatory liver disorder frequently encountered in med and whose varying disease presentation can create a perplexing case for the clinician

Case Info: Our patient is a 25-year-old male with history of Autism, Fragile X syndrome, and is adopted who presented to outside hospital (OSH) for severe right upper quadrant abdominal pain. The pain started day of admission and was associated with jaundice and vomiting. At OSH, INR was 1.4, total/direct bilirubin 16.9/12.8 mg/dL, ALP 221 U/L, AST 1837 U/L, ALT 1523 U/L, protein 12.7 g/dL, and albumin 3.9 g/dL. Interestingly, he was seen by his primary care physician two months before this admission. He was found to have total bilirubin 2.3 mg/dL, ALP 530 U/L, AST 517 U/L, and ALT 563 U/L. At that visit, his primary care physician started investigating LFT abnormalities. On another note, chart review showed he had similar milder presentation about 2 years before this admission. His total bilirubin was 1 mg/dL, ALP 784 U/L, AST 169 U/L, and ALT 367 U/L. Acute hepatitis panel is negative. CT abdomen at that time showed mild fatty infiltration of the liver without active focal hepatic mass. He did not follow with his primary care following discharge. Physical exam showed jaundice with excoriations and scleral icterus. No stigma of long standing liver disease were present including; organomegaly, tremors, spider nevi, or palmer erythema. MELD score was 20. Hepatitis panel, ANA, EBV, CMV, Tylenol level, ferritin, and ceruloplasmin were negative. Further workup showed an elevated IgG of 4972, elevated RNP, and elevated anti-smooth muscle antibody (ASMA) at 88 U (normal <20 U). Rest of workup was negative. Liver biopsy was consistent with autoimmune hepatitis.

Our patient was treated with prednisone 60 mg daily with a slow taper. Post-steroids, LFT/INR dramatically improved. TPMT was negative and he was started on azathioprine 50 mg qd.

Discussion: AIH is a rare disease that is more common in females and characterized by an insidious. Work up should include tox screen for, should not forget in patients seen in the outpatient setting. This is important as AIH can progress to hepatocellular carcinoma

Notes:

PV15

GEMELLA SPECIES BACTEREMIA AND STROKE IN AN ELDERLY PATIENT WITH RESPIRATORY TRACT INFECTION: A CASE REPORT

S Jayananda, N Gollol-Raju, N Fadul

Introduction: Gemella species are part of normal human flora. They are rarely associated with infections. As opportunistic pathogens, they can cause life threatening infection, predominantly endocarditis, in individuals with risk factors. We present an unusual case of an elderly patient, with no predisposing risk factors, who presented with respiratory tract infection and Gemella species bacteremia who suffered a stroke in the absence of features of endocarditis

Case report: An 82-year-old Caucasian male with no significant past medical history presented with several days of fever, malaise, minimally productive cough and some confusion. Exam was unremarkable. Laboratory profile showed elevated WBC count. Chest XR was unremarkable. Blood cultures grew gram positive cocci which by the fifth day was identified as Gemella species. Patient subsequently developed a dense stroke and passed away.

Conclusion: Gemella species, as opportunistic pathogens, can cause life threatening infections in individuals with predisposing risk factors. As noted in our case, usual risk factors may not be always present but advanced age should be considered a predisposing risk factor for Gemella species infection. Primary respiratory tract infection and infections or disruption of the gastrointestinal and genitourinary tract mucosa could lead to invasion and secondary infection with Gemella species as they are normal flora of these tracts. As such, in these circumstances, Gemella species infection should be of consideration when culture media demonstrate slow growing gram positive organism. Our case is unusual in that Gemella species bacteremia was noted without any endovascular or other organ involvement that could be identified. The cause of our patient's stroke is likely related to primary central nervous system vascular disease but the possibility of septic emboli related to Gemella species endocarditis could not be entirely ruled out.

Notes:

PV16

AN UNCOMMON CASE OF UPPER GASTROINTESTINAL BLEED FROM GASTRIC MALT LYMPHOMA: A CASE REPORT

S Jayananda, B Simpson, N Gollol-Raju, W Leland

Introduction: Upper gastrointestinal bleeding (UGIB) is a common medical condition with substantial morbidity and mortality. Some of the common etiologies include gastric and or duodenal ulcers, esophagogastric varices, erosive esophagitis, gastritis, or duodenitis, portal hypertensive gastropathy, and vascular malformations. We present an interesting case of UGIB from gastric extranodal marginal zone B cell lymphoma, previously called MALT lymphoma.

Case report: An 81 yr old Hispanic male presented with ten day history of abdominal pain and dark tarry stools. He drank alcohol regularly and chewed tobacco daily. Denied non-steroidal anti-inflammatory medication use. At presentation, vital signs were stable and examination was significant only for abdominal tenderness and hemoccult positive stools on rectal examination. Hemoglobin level was 11.8 gm/dL. A CT of the abdomen showed no acute abnormality except for hepatic steatosis. Esophagogastroduodenoscopy (EGD) revealed multiple clean based ulcers and erosions in the gastric antrum from which biopsies were taken. Pathology showed extranodal marginal zone lymphoma of mucosa associated lymphoid tissue (MALT lymphoma) and no definitive Helicobacter pylori organisms. H pylori serology was positive for IgG and IgA antibodies but negative for IgM antibodies. Patient's hospital course was otherwise unremarkable. He has completed therapy for H pylori infection and has continued on proton pump inhibitors. At six months, repeat EGD demonstrated healed antral ulceration but with residual areas of erythematous mucosa. Biopsy from these showed absence of any morphologic features indicative of MALT lymphoma.

Discussion. Neoplasms of the upper gastrointestinal tract account for less than 3 percent of all cases of severe UGIB. Bleeding can result from mucosal ulceration or from erosion into an underlying vessel. Extranodal marginal zone B cell (MALT) lymphoma is an indolent lymphoma that frequently presents with localized, early stage disease, and is one of the most common histologic types of gastric lymphoma. Management is dependent on the stage and concomitant presence or absence of H pylori infection. Early stage MALT lymphoma with H pylori infection is managed by eradication of H pylori infection, as done with our patient, with demonstration of histologic complete remission.

Notes:

PV17

PSEUDOMEMBRANOUS COLITIS-NOT NECESSARILY CLOSTRIDIUM DIFFICILE INFECTION! A CASE REPORT

S Jayananda, N Gollol-Raju, G Harvin

Introduction. Pseudomembranous colitis is classically associated with and highly suggestive of Clostridium difficile infection but can be a consequence of other disease processes as well. Severe inflammation of the inner lining of the bowel mucosa and mucosal necrosis cause pseudomembranes. We present a case of pseudomembranous colitis secondary to severe ischemia.

Case report. A 55 year old Caucasian female with hypertension presented with several days history of abdominal pain and watery diarrhea with subsequent transformation in to bloody diarrhea. History was significant for using Phentermine for three days prior to the presentation. At initial presentation she was hypotensive needing fluid resuscitation and vasopressor support. Laboratory profile was significant for acute kidney injury with creatinine 8.86 mg/dl, lactic acid 3.2 mmol/L and WBC 12.3 k/uL. A non-contrast CT abdomen showed findings suggestive of colitis involving the splenic flexure and descending colon. Flexible sigmoidoscopy revealed diffuse severe ulcerations of the rectum and sigmoid colon. Histopathology findings were consistent with pseudomembranous colitis. Stool studies (twice) were negative for clostridium difficile toxin assay, culture, ova and parasites. The etiology of pseudomembranous colitis was likely from ischemic colitis related to Phentermine use. Patient improved significantly with supportive care alone.

Discussion. Several etiologies apart from clostridium difficile infection can cause pseudomembranous colitis. Ischemia, inflammatory bowel disease, chemical injury, certain medications, and infections pathogens other than clostridium difficile can cause mucosal injury and subsequent pseudomembrane formation. This case report highlights the need for clinicians to be aware of other etiologies of pseudomembranous colitis including ischemia.

Notes:

PV18

RENAL MASS AND BILATERAL RENAL VEIN THROMBOSIS IN A YOUNG GIRL

S Wasim, S Awadallah, P Kaur, JR Powell

Learning Objectives: The purpose of this presentation is to discuss an interesting initial presentation of SLE, its diagnosis and its treatment.

Case: An 18 year old African American female initially presented to an outside hospital with diffuse abdominal pain which later localized to the right side. Patient also endorsed slight lip swelling and diffuse rash which resolved with OTC medications two weeks prior. CT Abdomen/Pelvis was done and showed a large mass in lower pole of the right kidney with diffuse lymphadenopathy and bilateral renal vein thrombosis. This finding was concerning for cancer, specifically renal cell carcinoma with possible metastases. Patient was transferred to our facility for further evaluation. On exam, she had RLQ tenderness on palpation and right CVA discomfort. She also had cervical and inguinal lymphadenopathy. Initial lab work showed slight leukocytosis, low calcium, normal renal function, albumin of 2.0 and total protein of 5.6. Her urinalysis showed 3+ proteinuria. Interventional radiology was consulted for renal biopsy. Patient was anticoagulated with heparin. Initial renal biopsy showed cortical interstitium w/ mild lymphoplasmacytic infiltrate and was negative for malignancy. Nephrology was consulted and a repeat renal biopsy done a few days later showed the following: frequent, medium to large subepithelial immune complex (IC) deposits with associated GBM reaction; frequent, small to medium mesangial IC deposits; and extensive podocyte foot process effacement. ANA was sent and came back negative; however, patient was positive for anti-ds DNA. Patient was diagnosed with Class V lupus nephritis and treatment was started immediately. She was started on cellcept and high dose steroids; she showed an almost immediate significant improvement.

Summary: SLE has many different initial presentations and renal involvement is common. The most common type of renal involvement in SLE is immune-complex mediated; this is diagnosed via renal biopsy. International Society of Nephrology (ISN) divides SLE-associated glomerular disease into six categories. Based on her histology and clinical presentation, our patient fell into class V, or membranous lupus nephritis. Therapy includes immunosuppressive drugs, antihypertensive drugs, antiproteinuric drugs, lipid lowering drugs, and occasionally, anticoagulation.

Notes:

PV19

RARE FUNGAL INFECTION IN A CANCER PATIENT AND ITS TREATMENT

S Wasim, C Hite, L Zha, A Prashanti

Learning objectives: Discuss the importance of diagnosing unusual opportunistic fungal infection in cancer patients and treatment

Case: 70 year old African American male with history of Chronic Lymphocytic Leukemia (CLL) and Small cell lymphocytic lymphoma (SLL) presented with chief complaint of hemoptysis. Patient had been previously treated with R-COP (chemotherapy regimen) and was on low dose steroids at the time of presentation. He also reported weight loss of 10 lbs in 2 weeks. Physical exam was unremarkable except for fever of 101.3. Labs showed WBC of 12.5, Hgb 9.9, platelets of 56 and ANC of 500. A CT chest was done and showed a thick walled cavitary lesion in apex of right lung measuring 3.4 X 3.1cm, worrisome for cavitary pneumonia, malignancy, abscess or fungal lesion. This lesion was not present on a CT from 2 years prior. Patient was started on broad spectrum antibiotics. Pulmonary was consulted for bronchoscopy and biopsy of lung lesion. Tuberculosis was ruled out. Fungal stain from BAL showed many septated hyphae and his culture came back positive for 2+ *Scedosporium/ Pseudallescheria boydii*. Patient was immediately started on Voriconazole; first dose of 6mg/kg Q12H, followed by 4mg/kg Q12H on day 2 and onwards for total of 12 weeks. A follow up CT in 4-6 weeks was scheduled with Pulmonary Medicine.

Summary: One should have a high index of suspicion for unusual fungal opportunistic infections in CLL and other lymphoproliferative disorders.

Special attention must be paid to any cavitary lesions seen on chest X-ray or CT scan. Mold infections that are being recognized recently include those secondary to *Scedosporium*. The two major human pathogens are *Scedosporium prolificans* and *Scedosporium apiospermum* (including *S. boydii*). Diagnosis is via histopathologic examination and culture. Voriconazole is used to treat *S. apiospermum* due to its greater in vitro activity when compared to other azoles for total of 12 weeks.

Notes:

PV20

DOC, MY EYES ARE RED, WHAT IS WRONG WITH ME

B Dunn, A Weil, S Liu,

Learning Objectives: Understand that vitamin B12 (cobalamin) is required for cell DNA synthesis and deficiency results in macrocytic anemia and may cause leukopenia and thrombocytopenia. Know the risk factors for B12 deficiency and the work-up for patients presenting with macrocytic anemia (MCV > 100). Understand that there are multiple causes for B12 deficiency. Both B12 and folate deficiency will show megaloblastic morphology but only B12 deficiency will have neuropsychiatric symptoms. An elevated serum methylmalonic acid level is more sensitive and specific for diagnosing B12 deficiency than low serum B12 levels. Understand when and how to treat B12 deficiency and what is the prognosis for these patients.

Case Information:

We describe a case with a 52 year old African American female who presented with bilateral eye redness and discomfort. Her past medical history for asthma, anemia and tobacco abuse. She presented with a 2 day history of bilateral eye redness and discomfort and endorsed fatigue, generalized weakness and SOB over the last 6 months and 20 lbs weight loss over the last 1 month. She did endorse dark stools and had been using goody powders for years, but was hemocult negative on exam. Her WBC 3.4 k/ul, hemoglobin 3.5 g/dl, MCV 136, platelet count 25 k/ul. She received 2 units of blood. Her B12 level was found to be < 90 and had elevated methylmalonic acid (MMA) and homocysteine consistent with pernicious anemia. She was started on IM vitamin B12 injections and plan is to continue for life.

Summary:

Vitamin B12 deficiency leads to delayed DNA synthesis in rapidly growing hematopoietic cells, resulting in a macrocytic anemia, MCV > 100 and possibly pancytopenia. Meat and dairy products provide our dietary source of vitamin B12. There are numerous causes for B12 deficiency and treatment can be po, intranasal or IM injections, based on cause and severity of deficiency and anemia.

Notes:

PV21

IFOSFAMIDE INDUCED ACUTE INFLAMMATORY DEMYELINATING POLYRADICULONEUROPATHY

D Feldman, J McClain, P Atluri, M Muzaffar

Learning Objectives: Acute inflammatory demyelinating polyneuropathy (AIDP) is an autoimmune process that is characterized by progressive areflexic weakness and mild sensory changes with around 20% of patients ending up with respiratory failure. Ifosfamide has been associated with neurotoxicity predominately encephalopathy. Peripheral neuropathy is a less well-known side effect. We report a rare case of AIDP resulting in quadriparesis following ifosfamide administration for sarcoma.

Case Information: 67yo Caucasian male with PMH of DM type 2, HTN with history of colon cancer treated with left hemicolectomy and adjuvant chemotherapy and gastrointestinal sarcoma treated with imatinib with progression of abdominal mass. Repeat biopsy of retroperitoneal mass revealed high grade sarcoma, consistent with recurrent dedifferentiated liposarcoma. The patient was started on chemotherapy Ifosfamide 2.5 g/m²/day IV continuous infusion on days 1-3 plus Doxorubicin 20 mg/m²/day IV continuous infusion on days 1-3 plus Mesna 2.5 g/m²/day IV continuous infusion on days 1-4 (MAI). The patient within 3 weeks of chemotherapy presented with lower extremity weakness and tingling which was initially attributed to peripheral neuropathy from oxaliplatin in past and patient was treated symptomatically and started on second cycle of ifosfamide, which led to rapid worsening of symptoms leading to progressive ascending quadriparesis. Chemotherapy was discontinued immediately. EMG revealed evidence of acquired inflammatory demyelinating polyneuropathy consistent with AIDP, CSF elevated protein. Imaging negative for metastasis. The patient was promptly treated with a 5 day course of intravenous immunoglobulin (IVIG) and had marked improvement by day 3 of treatment. He was accepted to inpatient rehab and made a full recovery.

Summary: We report one of the few cases of AIDP associated with ifosfamide administration. AIDP should be considered in the differential diagnosis of new neurologic symptoms in patients with treated with antineoplastic drugs. This case highlights importance of prompt recognition of AIDP and treatment with IVIG along with discontinuation of offending drug resulted in complete resolution of quadriparesis. The patient completed his inpatient rehab and has no residual weakness.

Notes:

PV22

HEMOPHAGOCYTIC LYMPHOHISTIOCYTOSIS IN AN ADULT: DIAGNOSTIC CHALLENGES

R Pinnamaneni, M Muzaffar, G Gagnon, D Liles, A Weil

Learning Objective: Secondary Hemophagocytic Lymphohistiocytosis (HLH) is a life-threatening hyperinflammatory syndrome caused by severe hypercytokinemia due to a highly activated but ineffective immune process resulting in phagocytosis induced cytopenias, progressive multi-organ failure and death. Early diagnosis of HLH is challenging as it often presents as a febrile illness with multisystem involvement. The learning objective of our case is to highlight the challenges associated in diagnosis and treatment of this rare but often fatal clinical entity due to a delay in treatment. **Case:** We present a 46 year old Caucasian male who presented with complaints of dark urine, 20 pound weight loss, night sweats and fevers over a week. On admission, he had fever (103F) leukopenia (1,100), absolute neutrophil count (800), hemoglobin of 11.5 g/dl and platelet (39,000), acute renal failure, liver failure, with a total bilirubin of 4.7. Differential diagnosis included malignancy and sepsis. The pancytopenia prompted a Hematology consultation which revealed ferritin of 8250 ng/ml and LDH 2379 U/L. This, coupled with fever, cytopenias, splenomegaly, and hypofibrinogenemia (79 mg/dl) triggered a clinical suspicion for HLH. Workup for infection and autoimmune disorder was negative except EBV on PCR 801 copies/ml. The patient met 5 of 8 required diagnostic clinical criteria for HLH, and in view of his hemodynamic instability and multi-organ failure, prompt treatment with HLH-94 protocol was initiated with etoposide 150mg/m² biweekly and dexamethasone 10mg/m² daily, while further work up was in process. A bone marrow biopsy was negative. PET scan of the chest, abdomen and pelvis showed increase activity in the spleen. Splenectomy was done to rule out splenic lymphoma. Pathology showed hemophagocytosis. Molecular tests showed reduced NK cell activity, and elevated soluble CD25 level at 12,042 units/ml, confirming the diagnosis of HLH. The patient dramatically improved and completed treatment course. **Conclusion:** This case highlights the importance of the need for high clinical suspicion for early recognition and prompt treatment of HLH which is often fatal if left untreated. The diagnosis of HLH is challenging because the symptoms are nonspecific and many features overlap with other causes of severe illness including sepsis and malignancy. While awaiting more definitive work up, expedited initiation of therapy should be pursued, aiming to suppress immune system, which, as in this case, can be lifesaving.

Notes:

PV23

DIFFUSE LARGE B CELL LYMPHOMA WITH TRISOMY 14

A Hegde, M Muzaffar

Learning Objectives: Diffuse Large B-cell lymphoma (DLBCL) comprises about 25- 30% of all Non-Hodgkin's lymphomas (NHLs). Various non-recurrent cytogenetic abnormalities, translocations, trisomies and monosomies are frequently found in DLBCL. Gene expression profile categorize DLBCL into different molecular prognostic groups. Trisomy 14 is a rare recurrent genetic abnormality found in myeloid neoplasm but not reported in DLBCL. We present a case of DLBCL with fulminant clinical course harboring a very rare cytogenetic abnormality, trisomy 14.

Case Information: A 60 year old woman presented with a 3 week history of abdominal pain, anorexia, 40lb weight loss and drenching night sweats. A CT abdomen/pelvis revealed a right upper quadrant (RUQ) mass, peritoneal carcinomatosis and ascites. Ascitic fluid was non-diagnostic. CA 125 was elevated at 9842U/mL. She was admitted to VMC following an unsuccessful EGD, EUS guided biopsy of the RUQ mass due to a large hiatal hernia. An FNA of an enlarged celiac lymph node was showed B-cell lymphoproliferative disorder of germinal center origin. Subsequent CT guided biopsy of the RUQ mass confirmed DLBCL, germinal center type. A bone marrow aspiration and biopsy showed only flow cytometric evidence of C10+ B cell lymphoma without morphologic evidence. The patient had a very rapid clinical decline with multiorgan failure, treatment was started immediately with R-CHOP regimen. Cytogenetics performed on bone marrow aspirate also showed trisomy 14 in 2 out of 20 GTG banded metaphases analyzed. Despite aggressive treatment and supportive care, the patient succumbed to multi-organ failure one week after initial presentation.

Summary: This case of germinal center-DLBCL, which is often associated with better prognosis, had a very rapid clinical course causing fatal multiorgan failure, highlighting an aggressive tumor biology. Cytogenetics revealed a rare trisomy 14 which is often associated with myeloid malignancy but has not been reported in lymphoid malignancies. Confirmation of this trisomy in additional tumor specimen with FISH could not be undertaken as patient is deceased. This patient's catastrophic disease course may have a possible association with trisomy 14, but further research is warranted.

Notes:

PV24

GRANULOMATOUS DISEASE MANIFESTING AS REFRACTORY HYPERCALCEMIA AFTER TYROSINE KINASE INHIBITOR (TKI) THERAPY

N Sharma, PA Lepera, JG Rosenman, PR Walker, G Stroud

Objectives: Ibrutinib, a Bruton's Tyrosine Kinase inhibitor, has emerged as an effective first line treatment for chronic lymphocytic leukemia (CLL) with 17p deletion. Ibrutinib is associated with various side effects, however activation of granulomatous disease has not been reported.

Case: 58 yo Caucasian female presented with worsening fatigue. She was found to have WBC $-42.6 \times 10^3/\text{mm}^3$, lymphocytes- 76%, normal Hb and platelets, Calcium(Ca)-10.1mg/dl, albumin – 4.4g/dl, Creatinine – 0.8mg/dl, beta-2 microglobulin – 2.2mg/L. A previous scan showed scattered lymphadenopathy with calcific granulomas in the spleen. She was diagnosed with Rai stage 0 CLL with bone marrow biopsy showing 40% involvement, del 17p, unmutated IGVH, ZAP70 positive. Considering the high risk features, she was started on ibrutinib 420 mg¹. Three months later, she was admitted with vomiting, constipation, abdominal pain with Ca– 14.3 mg/dl, Cr-1.4mg/dl, PTH - 6.3pg/mL(13.8-85) , PTH-RP 18 pg/mL(14-27), TSH - 2.1uIU/mL, 1.25 dihydroxy vitamin D – 148pg/mL(18-72), Angiotensin-1 convertase enzyme(ACE)- 99U/L(14-82). A bilateral bone marrow biopsy showed responding disease with 15% CLL cells without richter's transformation. CT scan did not reveal mycobacterial infection or occult primary. Other causes of hypercalcemia such as multiple myeloma, surreptitious calcium or vitamin intake were excluded. Tuberculin test was negative. Two months later she had inflammatory uveitis with lymphocytic infiltrate on biopsy. She had refractory hypercalcemia despite treatment with bisphosphonates and RANKL antibody until ibrutinib was discontinued.

Summary: In this case, elevated 1.25 di-hydroxy vitamin D, ACE level, uveitis and evidence of lymphadenopathy is suggestive of granulomatous disease. CLL cells exhibit regulatory function by expressing interleukin (IL-10)² causing immunosuppression. Ibrutinib inhibits production of IL-10 by CLL cells thus lowering immunosuppression³, and activating dormant granulomatous disease. Ibrutinib also modulates tumor microenvironment by promoting a Th1(T-helper cell) response thereby creating Th1/Th2 imbalance which has been studied in the pathogenesis of sarcoidosis.⁴ Further studies of the effect of ibrutinib on T-cell regulation are needed as its use is expected to increase in the near future.

Notes:

PV25

METASTATIC INVOLVEMENT OF THE STOMACH BY BREAST CANCER: 2 CASES

J Hildebrand, M Muzaffar

Learning Objectives: Gastric metastasis (GM) is an infrequent phenomenon in the natural history of breast cancer. The incidence of GM has been estimated at 0.3-18% of patients with metastatic breast cancer. It is important to distinguish gastric metastases from a primary gastric carcinoma as treatment differs and to avoid unnecessary surgery. **Case:** Patient 1 is a 43 year old female who was diagnosed in April 2010 with stage II ER/PR-, Her2+ breast cancer. She underwent partial mastectomy, adjuvant Docetaxel/Carboplatin/Traztuzumab followed by total mastectomy for positive margins. In March 2013, she was diagnosed with metastatic disease and treated with Docetaxel/Herceptin/Pertuzumab and radiation to the spine. Repeat imaging showed a mixed response and her treatment was changed to ado-trastuzumab emtansine. A PET scan in April 2014 demonstrated hypermetabolic activity throughout the stomach. A subsequent EGD showed a mass and diffusely abnormal mucosa. Biopsies reported metastatic poorly differentiated carcinoma ER+, PR-, Her2+. She was subsequently treated with trastuzumab/capecitabine/lapatinib. The patient had interval progression and is currently being treated with carboplatin/gemcitabine. Patient 2 is a 69 year old female who was diagnosed in 1997 with stage I ER+ breast cancer treated with partial mastectomy, radiation and tamoxifen. In 2002 she was diagnosed with a second primary stage I ER+ breast cancer treated similarly with anastrozole. In 2013 patient progressed with metastatic ER positive disease in the pelvis. She was treated with exemestane until disease progression and she was switched to capecitabine followed by with fulvestrant. In February 2015, PET scan revealed uptake in the stomach. An EGD subsequently revealed friable mucosa with ulcerations. Biopsies confirmed metastatic adenocarcinoma, ER+. Unfortunately, the patient declined further treatment after developing a small bowel obstruction and opted to pursue symptom management alone. **Summary:** Gastric metastasis of breast cancer is rare and often underdiagnosed. Metastatic spread to the stomach may occur many years after the initial treatment for breast cancer. GM must be distinguished from a primary gastric cancer as management is different. These cases also highlight the occurrence of GM in two different subtypes of breast cancer.

Notes:

PV26

RECOGNIZING A CASE OF MUIR-TORRE SYNDROME; A SUBTYPE OF LYNCH SYNDROME

J Turbeville, K Liner, R Proctor, W Burke, C Simons

Learning Objectives: This case will illustrate the importance of putting dermatologic findings together with the entire medical history to pinpoint a very important diagnosis: Muir-Torre Syndrome (MTS). MTS is considered to be a subtype of the autosomal-dominant Lynch Syndrome (Hereditary Nonpolyposis Colorectal Cancer Syndrome). We will also summarize the features of this syndrome and its diagnostic criteria, both of which carry lifelong significance to affected patients and their families.

Case information: A 46 year-old woman presented to the outpatient dermatology clinic for routine follow up due to history of keratoacanthoma-type squamous cell carcinoma (SCC-KA type). She had complaints of several long-standing yellowish lesions on the face, some of which were becoming symptomatic. The lesions appeared to be of sebaceous origin. Further questioning revealed a family history of colorectal cancer leading to death in her father at age 31 and grandfather at a young age. Furthermore, in the course of the year since she was last seen at our office, she was diagnosed and treated for urothelial bladder carcinoma. She also noted carrying a history of possible early endometrial carcinoma. A biopsy was performed on two of the greater than 20 lesions on her face. Pathology examination revealed sebaceous adenomas. These skin biopsies, her clinical appearance and her past medical and family histories yielded the diagnosis of Muir-Torre Syndrome. As a result of this diagnosis, she and her 5 children are empowered with knowledge of the syndrome, their risks, and appropriate strategies to detect this genetic disease and associated malignancies.

Summary: Muir-Torre Syndrome is a subtype of the more well-known Lynch Syndrome (HNPCC Syndrome), which is caused by genetic mutations (loss of function in MLH1 and MSH2) in DNA-mismatch repair proteins. This failure to repair DNA is associated with sometimes-lethal malignancies including colorectal cancer, genitourinary cancers, breast cancer and non-melanoma skin cancers. By recognizing these skin lesions and taking a thorough history, a diagnosis can be made prior to the development of said cancers. Furthermore, families can receive genetic testing and counseling.

Notes:

PV27

TWO CASES OF OPHTHALMIC TRIGEMINAL TROPHIC SYNDROME

MM Ash, EL Stewart, CM Phillips

Learning Objectives: Trigeminal trophic syndrome (TTS) is a rare cause of ulcers secondary to skin excoriation due to trigeminal nerve (CN V) anesthesia and paresthesia. TTS typically affects the nasal ala within the maxillary distribution and results from trigeminal ablation and strokes. We report two cases of TTS within the ophthalmic distribution associated with herpes zoster and discuss the importance of early detection.

Case 1: A 73 year-old male had a herpes zoster outbreak within the left ophthalmic distribution. He was started on acyclovir and also developed a gram negative infection managed with antibiotics. Later, postherpetic neuralgia was diagnosed, and he was given 900 mg of gabapentin daily but switched to 150 mg of pregabalin daily at 1 month due to drowsiness. After 7.5 months, a left frontal scalp ulcer developed (negative for HSV1/2 and VZV by DFA). At 8.5 months, a biopsy of the 10 cm ulcer showed lichen simplex chronicus with erosion, ulceration, and mild atypia but no viral cytopathology or evidence of malignancy. He reported picking the ulcer due to the sensation of "hairs being pulled by the root" and was restarted on 900 mg of gabapentin daily. At 14 months, the 9 cm ulcer showed slow healing with silvercel treatment.

Case 2: An 82 year-old male had a herpes zoster outbreak on his left face and scalp in the V1 distribution. He was admitted to the hospital 2-3 weeks later due to malaise, chills, headache, and bilaterally blurred vision. His left eye was swollen by suppurative cellulitis extending from the left orbit to the left occipital scalp, which spread to his right eyelid and scalp. He developed sepsis and respiratory failure. He later developed a large scalp ulcer in the V1 distribution and was started on 600 mg of gabapentin daily. At discharge, the wound was mostly granulated, but after 2 months, a large scalp ulcer associated with burning and itching persisted. His left eye defect remained.

Summary: While gabapentin and other drugs may decrease TTS ulcer inducing paresthesias, management remains challenging. Early detection is critical for patient education and the reduction of paresthesias and self-manipulating behavior. However, the current cases showed slow healing despite gabapentin use. While infrequent, ophthalmic distribution post-zoster TTS can occur and should be included in the differential diagnosis of non-healing ulcers

Notes:

PV28

TWO CASES OF DEMODEX FOLLICULITIS

MM Ash, AI Grossman, CM Phillips

Learning Objectives: While *Demodex brevis* and *Demodex folliculorum* are mites that commonly inhabit the pilosebaceous units of most adults without consequence, increased mite density may induce dermatologic eruptions; therefore, demodicosis should be considered in refractory dermatologic eruptions. We describe two cases of demodex folliculitis.

Case 1: A 20 year-old male presented with erythema and scaling of the malar cheeks. His past medical history was significant for papulopustular acne, which was stable on minocycline 100mg twice daily and topical clindamycin phosphate 1% twice daily. A skin scraping KOH preparation was negative for hyphae but positive for demodex mites. Sulfacetamide sodium-sulfur 10-2% topical cream twice daily was added to his regimen, and he was instructed to return in two months.

Case 2: A 75 year-old male presented with pustules on his forehead, cheeks, and nose that he had treated with triamcinolone cream 0.025%. Gram stain of pustular fluid showed few gram positive cocci, and a KOH preparation of a facial pustule showed demodex mites. Metronidazole 0.75% lotion was prescribed for twice daily application. Three months later, he reported minimal improvement of the pustules, though he had only been using the metronidazole lotion once daily. Repeat KOH preparation showed demodex mites. He was instructed to increase use of the metronidazole lotion to twice daily and to begin using permethrin 5% cream 2-4 times a week if no improvement was noted with metronidazole alone.

Summary: Demodicosis can present as pityriasis folliculorum, pustular folliculitis, demodectic blepharitis, perioral/periauricular/periorbital dermatitis, rosaceiform demodicosis, demodectic abscesses, and papulopustular scalp eruptions. With the two current cases of demodex folliculitis, our patients received either sulfacetamide sodium-sulfur or metronidazole 0.75% lotion as the initial treatment. Treatment approaches for demodicosis have included oral metronidazole or ivermectin and various topical drugs (sulfur products, permethrin, crotamiton, benzyl benzoate, lindane, and metronidazole). Combining ivermectin with topical permethrin, benzyl benzoate, or metronidazole has also been used to achieve greater remission. While ivermectin may be considered the treatment of choice by some investigators, data is currently insufficient to accurately guide therapy.

Notes:

PV29

NON-MELANOMA SKIN CANCER IN SKIN OF COLOR: CASES OF MISTAKEN IDENTITY

A Newsome, J Subash, C Phillips

Learning Objectives

1. Understand the differences in clinical presentation of NMSC in skin of color
2. Reinforce the importance of considering NMSC in non-healing and/or chronic lesions in skin of color

Case Information

Basal cell carcinoma (BCC) and squamous cell carcinoma (SCC) are common non-melanoma skin cancers (NMSC) highly prevalent in fair-skinned populations. While UV light protection is an important risk factor, there are other environmental factors, immunosuppressed and chronic disease states that also increase risk of their development. NMSCs are commonly misdiagnosed or diagnosed at a more advanced stage in darker skinned individuals compared to white patients, and is often associated with increased morbidity and mortality. Here we present four cases of misdiagnosed SCC in skin of color:

A 57yr old black male with large ulcerated growth on penis treated as genital herpes for 8 years

A 19yr old black female with a growth under right middle fingernail present for 5 years.

A 50 yr old black male with hx of kidney transplant with painful brown plaque on right hip present for 1 year.

A 32yrs old black female with history of non-healing ulceration on gluteal cleft for 5 years.

Summary

As each case prior to biopsy in our clinic were diagnosed as herpes, hang nail, seborrheic keratosis, and decubitus ulcer respectively, we hope to illustrate the importance of increasing the index of suspicion and understanding the different presentations of NMSC in darker skinned individuals which is paramount to early and successful intervention

Notes:

PV30

HYPERNATREMIA AFTER BARIATRIC SURGERY: NDI WITH UNKNOWN ETIOLOGY

J Zhang, I Owoyemi, R Obi, MJ Barchman, HL Lai

Importance: Hypernatremia is a common electrolyte disorder with incidence of about 0.3-5.5% in hospitalized patient, bearing 30-80% mortality in the setting of ICU patients. Thus, appropriate recognition of underlying etiology is vital to treatment of this disorder.

Objective: A rare etiology of hypernatremia and its therapeutic course.

Case: Here we report 56 yo CM w/PMHx of T2DM, morbid obesity, who was referred to nephrology consult service for evaluation of hypernatremia. He was initially admitted to the hospital for bariatric surgery complicated by EJ tube leakage, ended up with multiple OR visits. His lab testing revealed Na⁺ level of 140s prior to hypernatremia (160-165). Serum osmolality was 320s mOsm, urine osmolality 100s mOsm, urine Na⁺ of 20 mmol/L, urine CL⁻ 43, urine K⁺ 15.4, urine Cr 18.18 mg/dL. No proteinuria or glycosuria.

His free water deficit was calculated as 11L, abnormality in sodium was soon corrected to 140s by D5W. Shortly after, the patient developed massive volume of urinary output greater than 4L per day. DDAVP was administered and titrated to 30 mcg bid without improvement in urine output or osmolality, suggesting that nephrogenic diabetes insipidus was the likely cause in this case. Thereafter, HCTZ and amiloride were started with gradual improvement in the polyuria-polydipsia over a period of about 3 weeks. The patient was educated on good management of osmotic load and water intake and ultimately discharged on HCTZ 12.5mg bid.

Evidence review: NDI is a rare cause of hypernatremia, but inherited defects may become manifest in post-operative or otherwise NPO patients. In adult settings, most cases of NDI are an acquired form secondary to medications or electrolyte abnormalities. Here, we ruled out lithium use, hypokalemia and hypercalciuria. Genetic testing for possible mutations in patient and his family were discussed. Samples will be drawn and sent to lab in Hopital du Sacre-Coeur de Montreal (Quebec) CANADA (Dr. Bechet).

Findings/Relevance: Compared to the many common pathogeneses of hypernatremia, nephrogenic diabetes insipidus (NDI) is a rare kidney disorder that may be inherited or acquired, and characterized by impaired ability of kidney collecting duct tubules to concentrate urine. Management for NDI paradoxically involves diuretics after correction of modifiable secondary contributing components. However, screening for genetic factors is warranted in scenarios with unknown etiology.

Notes:

PV31

UNCOVERING SCLERODERMA RENAL CRISES MASKED AS END STAGE RENAL DISEASE

S Sajadi, R Sarsour, R Obi

Learning Objective: To review an unexpected case of end stage renal disease associated with acute hypertension with emphasis on cause, methods of diagnosis, therapy, and applicability to practice.

Case: 47-year-old African American female with no pertinent past medical history other than a history of possible lupus diagnosed 6 months prior to presentation after complaints of symmetric joint pains/fatigue and seropositive laboratory markers. She was treated with plaquenil and prednisone, but again presented to an outside hospital with recurrent episodes of malaise and fatigue. She was found to have malignant hypertension (HTN) with severe acute kidney injury (AKI). Renal biopsy revealed findings of malignant HTN with associated arteriopathy with medullary predominance. There was no evidence of lupus nephritis with no immune complexes in IF and EM. There was insufficient cortical sampling of tissue to assess chronicity of injury. With no initial recovery of renal function after several intermittent hemodialysis (HD) treatments the patient was discharged to continue routine HD. A second opinion was requested for the etiology of her renal failure as she had no previous history of HTN.

Evaluation twenty-four hours after a HD a physical exam was pertinent for BP of 120/70 on Amlodipine 10 mg QD and Lopressor 100 mg BID. Skin exam showed symmetric thickening of the fingers extending proximal to the metacarpalphalangeal joints as well as shiny stretched appearance of the face. Labs were pertinent for BUN, Cr, K, Hgb, Platelet, positive anti-RNP, anti-Smith, Anti-Scl-70, ANA and anti-chromatin. It was concluded her renal failure was secondary to Scleroderma Renal Crises (SRC).

Summary: The presentation of new onset HTN and rapid progressive AKI leading to HD dependence warrants thorough clinical investigation to uncover the etiology. Renal failure may be reversible with appropriate therapy in the case of injury secondary to scleroderma renal crises. In our case study, there was great index of suspicion for SRC as the etiology of renal failure. For SRC related ESRD, continued ACE-I use is recommended.^{5,6} Lisinopril was maintained in our patient while on HD. Almost 3 months later, a 24-hour Urine study showed CrCl of 37 ml/min and HD was discontinued.

Notes:

PV32

IS THIS ORGANISM CAUSING MY SKIN INFECTION?

D Lebron, D Markham

Non-tuberculous mycobacteria (NTM) are generally free-living organisms that are ubiquitous in the environment. They were previously considered contaminants, but with the development of new microbiological methods, the importance of NTM in human disease became significantly evident. *Mycobacterium smegmatis*, a rapidly growing mycobacterium (RGM), is an uncommon cause of disease in humans, but it can cause skin and soft tissue infection, osteomyelitis and pulmonary infections as well. Acid Fast Bacilli (AFB) smear and tissue culture make the diagnosis. Treatment can be challenging as *Mycobacterium spp* are resistant to some antimicrobials. Combination of antibiotic therapy and surgical management appear to be the most effective treatment for the RGM.

We present a 75-year-old woman with history of HPV infection with diagnosis of squamous cell carcinoma of the vulva moderately differentiated, s/p right vulvectomy and right inguinal lymphadenectomy x 3, negative for metastasis. The surgical wound was healing well. 3 months later, she observed redness, swelling, and purulent discharge from the right groin different from the surgical wound site. She went to her primary physician and was started on Ciprofloxacin orally, which she took for 2 days, with mild improvement in symptoms, but it was discontinued due to interaction with warfarin. Cephalixin was recommended for 5 days without response, with another abscess in the surgical wound and a small one in the lower abdomen. She was admitted to the hospital for surgical debridement. AFB of the tissue was positive. Cultures showed *Mycobacterium smegmatis*. Patient was started on antibiotics awaiting susceptibilities. Eventually therapy was modified based on susceptibilities report achieving complete healing of the wound in 4 months.

M. smegmatis infection is extremely rare, but it can affect immunosuppressed and immunocompetent individuals. Non-tuberculous mycobacteria infection should be considered if adequate response is not achieved with commonly used antibiotics. AFB smear and culture for non-tuberculous mycobacterial organisms should be performed and susceptibilities studies should be ordered to identify the best antimicrobial therapy for these patients

Notes:

PV33

ARDS AFTER A SINGLE ORAL DOSE OF ACETAZOLAMIDE

A Abubaker, T Pancost, D Siraj

Introduction: Acute Respiratory Distress Syndrome (ARDS) is a life threatening respiratory condition characterized by hypoxemia and stiff lungs. The clinical manifestations of ARDS have been thought to be caused by a variety of insults.

We encountered a case of serious ARDS caused by a single oral intake of acetazolamide, a frequently used medication by several medical specialties especially in ophthalmology

Case Report: A 61-year-old male who underwent cataract surgery under local anesthesia. Post operatively, he received 500mg of acetazolamide to control intraocular pressure. One hr after, he presented to ED with severe chest pain associated with nausea and diaphoresis. Subsequently, he developed a respiratory failure. A diagnosis of ARDS was made. Patient had associated metabolic acidosis with Hco3 of 17 and PH of 7.22. After all of infectious and cardiac cause were ruled out, acetazolamide associated ARDS was considered.

Literature Review: We searched the English language literature published until May 11, 2015. Three Published cases of Acetazolamide induced ARDS were found. All three of them received acetazolamide prior to cataract surgery. Patients suffered acute respiratory failure few hours after administration of a single dose of acetazolamide. In each case, other causes of ARDS including infectious causes were ruled out. All of these cases were due to severe anaphylactic reaction to carbonic anhydrase inhibitor. Although uncommon, anaphylaxis or type I, IgE-mediated hypersensitivity reactions have been attributed to antibiotic sulfonamides. Type I reactions are mediated primarily by specific IgE antibodies, which trigger sensitized mast cells and basophils to degranulate, releasing histamine and other vasoactive mediators and resulting in urticaria, angioedema, bronchospasm, laryngeal edema, gastrointestinal disturbance, and hypotension.

Conclusion: clinicians and ophthalmologists should be aware of the potential for the development of ARDS in any patient who takes acetazolamide orally and develops any signs of acute respiratory failure with metabolic acidosis.

Notes:

PV34

A RARE CASE OF A FUNGAL PACEMAKER INFECTION

P Shah, A Stang, N Fadul, D Siraj

Learning objectives: To review and discuss the medical literature on a rare mucormycosis (zygomycosis) infection in an immunocompetent patient

Case Presentation:

A 87 year old white male with past medical history of HTN and complete heart block, status post pacemaker placement 10 years ago, underwent a pacemaker battery change at an outside hospital. A week later, he experienced pain and redness around the pacemaker site. He developed fever, chills, and worsening redness around the pacemaker, spreading to the left side of his chest, despite oral antibiotics. The patient was admitted, placed on IV antibiotics, and transferred to Vidant Medical Center. Subsequently he underwent removal of the pacemaker and all the leads. Cultures obtained in the OR revealed mold and yeast. Patient was placed on conventional amphotericin B but had a reaction to the drug, prompting its discontinuation. Instead, the patient was placed on a novel antifungal drug isavuconazonium sulfate. He required repeated debridement of the chest wall to achieve control of the infection. Due to lack of improvement after a week of treatment with this new antifungal agent, therapy was changed to liposomal amphotericin B, which he tolerated. The patient clinically improved, underwent a skin graft and was eventually transitioned to posaconazole. Patient was followed up as an outpatient and was doing very well. The mold infection was subsequently identified as *Apophysomyces trapeziformis*.

Discussion:

Mucormycosis is an aggressive, angioinvasive infection caused by mold species belonging to the Order Mucorales found in the soil or decaying organic matter. *Apophysomyces* species cause only about 5% of these rare infections and tend to affect immunocompetent hosts, in contrast to most mucormycoses. Specifically, necrotizing soft tissue infections with *Apophysomyces trapeziformis* have been reported in patients with traumatic injuries, including those sustained by a cluster of tornado victims in Joplin, Missouri. Successful treatment requires early debridement and initiation of effective IV antifungal therapy. Isavuconazonium sulfate is a new antifungal drug with activity against mucormycosis that was approved in 2015. Optimal duration of treatment of these rare infections is generally prolonged. Once the patient improves, the patient can be transitioned to an oral antifungal agent. As for this patient, the overall plan was to treat for 6 months.

Notes:

PV35

PULMONARY CRYPTOCOCCOSIS IN A PATIENT WITH PULMONARY-RENAL SYNDROME, RECENTLY INITIATED ON CORTICOSTEROIDS

K Malik, CJ Brown, ME Dauterive, BU Patel

Learning objectives:

Our patient with pulmonary-renal syndrome, soon after initiating corticosteroids, developed a pulmonary infection with *Cryptococcus neoformans*. We aim to learn about predisposition of patients with pulmonary-renal syndrome and on corticosteroid therapy, to develop pulmonary cryptococcosis. Cryptococcal colonization will also be discussed.

Case Information:

An 84-year-old man, with past medical history significant for CAD, atrial fibrillation on apixaban, CKD (baseline Creatinine 1.2), was initially admitted to an outside-hospital for progressive dyspnea for a week, and was treated with diuretics for presumed CHF. The patient developed hemoptysis during the hospital stay, prompting a CTA chest, which showed diffuse bilateral perihilar infiltrates. Antibiotics were started and anticoagulation discontinued. The patient's respiratory status failed to improve despite antibiotics and diuretics, and his renal failure worsened, for which he was transferred to Vidant Medical Center. On admission to VMC, Diffuse Alveolar Hemorrhage & pulmonary-renal syndrome were considered. Intravenous steroids were started. P-ANCA tested positive. Renal biopsy was consistent with pauci-immune glomerulonephritis. Patient underwent plasmapheresis. Bronchoscopy was consistent with diffuse alveolar hemorrhage, and BAL cultures revealed *Cryptococcus neoformans*; fluconazole was initiated. There was no evidence of systemic dissemination of cryptococcosis.

Summary:

Pulmonary cryptococcosis is not always symptomatic, and manifestation depends on immune status among other factors. Our literature review did not reveal any link between pulmonary cryptococcosis and pulmonary-renal syndrome. However, chronic, not acute, steroid therapy has been implicated as a culprit with the general mechanism being reduced cell-mediated immunity. There have been no case reports of development of pulmonary cryptococcosis after a short course of steroids, such as what our patient experienced. Our case highlights the importance of bronchoscopy with cultures in cases of pulmonary-renal syndrome, as concurrent infection would be critical to treat, especially since steroid and other immunosuppressive therapy would worsen the infection.

Notes:

PV36

SACCHAROMYCES CEREVISIAE EMPYEMA

MG Al Janabi, MS Dhillon, M Bowling

Learning Objectives:

Saccharomyces cerevisiae (S.c) is non-spore forming yeast, It is commonly known as "bakers or brewer's yeast". It is also used as a probiotic in humans, containing *Saccharomyces boulardii* (a subtype of S.c). *Saccharomyces* can colonize the mucosal surfaces and has been known to produce infections in immunocompromised patients, but rarely results in disease in the immunocompetent host.

Case Information:

An 89-year-old Caucasian female had been evaluated for chronic abdominal pain. A CT scan of the abdomen demonstrated a large hiatus hernia and she subsequently underwent a laparoscopic surgical repair. The postoperative course was unremarkable, and she was discharged home in stable condition on hospital day three. On postoperative day ten, she presented to the emergency department with coffee-ground emesis, tachypnea and hypoxia, Physical examination revealed decreased breath sounds in the right posterior hemi thorax, but crackles bilaterally. Laboratory tests revealed a (WBC) of 15.9 K/uL with 12-30% bands, lactic acid of 5.9 mmol/L. Due to impending respiratory failure, she required orotracheal intubation and mechanical ventilation. She later became hypotensive requiring vasopressor agents. A chest X-ray revealed a right basilar opacity and pleural effusion, and a CT scan of chest confirmed the presence of a right lower lobe consolidation and a pleural effusion. A thoracentesis was performed and 850 ml of red-colored fluid was removed. The pleural fluid analysis demonstrated WBC of 960, RBC of 83,685, PMN 84%, protein 2.9 g/dL (serum protein 3.9), LDH 150 U/L (serum LDH 248). The patient was initially treated empirically for aspiration pneumonia with Piperacillin/Tazobactam. Cultures obtained from the pleural fluid grew *Saccharomyces cerevisiae*.

Summary:

In the case above it is likely this immunocompetent patient, who had been ingesting probiotic supplements, became infected with this yeast due to micro-perforation during the hiatus hernia repair. One should obtain a high level of suspicion for infections with these organisms in any patient that has a potential interruption of a mucosal surface and ingestion of probiotics.

Notes:

PV37

AXONAL VARIANT GUILLAIN-BARRÉ SYNDROME ASSOCIATED WITH NON-HODGKIN'S LYMPHOMA – A RARE CASE REPORT

M Dhillon, L Zha, H Nguyen, FJ Lodeserto

Case Information: 75 year female old presented with upper extremity weakness, dyspnea associated with decreased sensation in upper extremities for 1 month. Other finding associated with her illness were constipation, urinary retention, and confusion and right eye visual disturbance for 3 days prior to admission. Admitted to general medicine floor with pneumonia however developed hypoxemic respiratory failure and cardiac arrest and transferred to the intensive care unit post cardiac arrest. Her course was complicated by septic shock, ARDS from underlying pneumonia as well as Acute Kidney Injury.

Investigations: CT scan of head and C-spine, EEG were unremarkable but CSF consistent with cyto-albuminic dissociation (WBC 4, Protein 438). Nerve conduction studies suggestive of primary polyneuropathy without evidence of demyelination or neuromuscular junction disorder.

Hospital Course: Treated with IVIG with initial working diagnosis of Millard Fisher variant of Guillain-Barre syndrome, however persistent weakness eventually requiring tracheostomy. Due to persistent lactic acidosis despite hemodynamic stability, patient underwent CT scan of abdomen and pelvis and chest which revealed an intra-abdominal malignancy, findings consistent with peritoneal carcinomatosis. Unable to biopsy lymph nodes due to their location near the aorta, repeat cytology from peritoneal fluid revealed non-Hodgkin lymphoma. Patient was treated aggressively with R CHOP treatment for non-Hodgkin B-cell lymphoma.

Summary: Though rare, clinical suspicion needs to be raised when a patient has type B lactic acidosis and variant of GBS for possible underlying malignancy.

Notes:

PV38

SEVERE ACUTE HEPATITIS DUE TO SERONEGATIVE AUTOIMMUNE HEPATITIS: A CASE REPORT

B Patel, S Jayananda, N Gollol-Raju, W Leland

Introduction: Autoimmune hepatitis [AIH] is a chronic hepatitis characterized by the presence of circulating autoantibodies and high serum globulin concentrations. It affects adults of all ages with a female predominance. Diagnosis of AIH based upon characteristic serologic and histologic findings and the exclusion of other forms of chronic liver disease. Seronegative AIH exhibit all the features of AIH but lack circulating autoantibodies. We here by present an interesting case of seronegative AIH who presented with severe hepatitis.

Case report: A 39 year old obese African American female with no significant past medical history presented with epigastric abdominal pain of several weeks duration and markedly abnormal liver function tests. At presentation she had stable vital signs. Examination was unremarkable except for scleral icterus. Her laboratory profile showed transaminases >1900 U/L, total bilirubin 9.5 mg/d, alkaline phosphatase 185 U/L, albumin 2.7 g/dL, total protein 7.4 g/d and INR 1.4. Patient denied alcohol or hepatotoxic medication use. A CT of the abdomen was significant for cirrhotic changes of the liver. Work up was significant for negative viral hepatitis profile and drug screen. Serology was negative for AIH autoantibodies. Liver biopsy demonstrated severe inflammatory and fibrotic changes with the presence of plasma cells. A diagnosis of seronegative AIH was made and considering the severity of hepatitis corticosteroid therapy was started. Liver function tests have significantly improved with ongoing corticosteroid therapy.

Discussion: Autoimmune hepatitis is a form of chronic hepatitis usually characterized by the presence of circulating autoantibodies which our patient lacked. It has marked variability in its clinical manifestation varying from asymptomatic indolent state to acute fulminant hepatitis. Our patient likely has had chronic indolent AIH with an acute exacerbation as demonstrated by cirrhotic changes on imaging study and acute on chronic inflammation with fibrosis in histology. Our patient did not have usual autoantibodies but histology was consistent with AIH with the demonstration of severe hepatic inflammation with many plasma cells. Corticosteroid therapy is the mainstay of treatment in AIH patients with acute severe presentation. Seronegative patients can respond well to corticosteroid treatment as well and those with severe presentations should not be denied this potential benefit.

Notes:

PV39

REFRACTORY HYPOXEMIA FROM INTRA-CARDIAC SHUNTING THROUGH PATENT FORAMEN OVALE

B Patel, P Singh, S Ogake, S Durrett, FJ Lodeserto

Learning Objectives: We describe a case of refractory hypoxemia caused by an acute elevation in pulmonary vascular resistance (PVR) secondary to a pulmonary embolism with resulting right to left intra-cardiac shunt through a patent foramen ovale (PFO).

Case Information: We describe a case of a 44-year-old female who presented with sudden onset of hypoxemic respiratory failure requiring emergent endotracheal intubation. In the immediate post-intubation course, the patient developed refractory hypoxemia not responsive to conventional therapies such as increased PEEP, increased FiO₂, and paralytics. Prior to intubation the patient received a CT Scan, which revealed a pulmonary embolism and bilateral infiltrates consistent with pneumonia. After careful review of the CT Scan, the medical team was not convinced there were enough radiographic abnormalities to account for the patient's extreme degree of hypoxemia. Following this heightened suspicion, a bedside echocardiogram was performed, which revealed right ventricular dysfunction and a PFO with right to left intra-cardiac shunting.

Summary: The acute management of elevated PVR leading to right to left intra-cardiac shunting through a PFO is not widely reported. The management includes: 1. Reduction and prevention of the clot burden, 2. Reducing pulmonary vascular resistance due to thromboembolism, 3. Supporting the systemic blood pressure to allow adequate coronary perfusion to the failing right ventricle, and 4. Inotropic support for the failing right ventricle. Studies suggest that inhaled nitric oxide decreases PVR without causing or exacerbating systemic hypotension. Recent publications also report the benefits of adding inotropic agents for increasing cardiac output. Without a bedside echocardiogram to diagnose sudden onset of elevated PVR, proper therapy could be delayed and consequences of worsening hypoxemia could result. Sudden onset of hypoxemic respiratory failure with refractory hypoxemia from Acute Respiratory Distress Syndrome is not uncommon in the acute setting. Management includes titrating PEEP, increasing FiO₂ and perhaps a trial of paralysis and prone positioning. We recommend not closing the PFO in the acute setting as this may decrease right ventricular function in the acute setting. A clinical judgment should be made to start the patient on anticoagulation or antiplatelet therapy.

Notes:

PV40

BORROWING A PAGE FROM THE PAST: USING AMINOPHYLLINE FOR AN ADULT WITH STATUS ASTHMATICUS

E Houshmand, J Stahl, H Nguyen, FJ Lodeserto

Learning Objectives:

Management of patients with status asthmaticus continues to pose a challenge to clinicians. Although use of corticosteroids and nebulized beta-2 agonists remain as cornerstones of therapy, there are cases when treatment becomes refractory. Although rarely used, Aminophylline remains an option to be used for adult patients with severe bronchospasm or in individuals where tachyphylaxis for beta-2 agonists occurs. It is crucial to be familiar with not only mechanism of action of the drug, but also monitoring strategies and adverse effects when managing such patients in a critical care setting.

Case Information:

52 year-old asthmatic presented with hypercapneic respiratory failure requiring mechanical ventilation. He was initially paralyzed, but after paralysis was discontinued he had persistent bronchospasm despite use of corticosteroids, continuous nebulized beta-2 agonists, heliox as well as anticholinergics. Furthermore, use of ketamine showed minimal help in his bronchospasm but its use was limited due to bronchorhea. With limited remaining options, aminophylline was started with excellent clinical response in the reduction of his bronchospasm.

Summary:

Use of aminophylline in management of status asthmaticus refractory to standard therapeutic measures was beneficial for our patient. Therapeutic characteristics of aminophylline have been addressed for decades. Data is scarce in adult population and rare trials are inconclusive. Prior case series have been noted to show therapeutic benefit in refractory cases. Monitoring serum levels to maintain a therapeutic level is essential to minimize well-known side effects of aminophylline.

Notes:

PV41

ALTERED WITH EXTREME AGITATION: 2 CASES OF POSTERIOR REVERSIBLE ENCEPHALOPATHY SYNDROME IN THE MEDICAL INTENSIVE CARE UNIT

J Stahl, F Houshmand, H Nguyen, FJ Lodeserto

Learning Objectives: To present a hard to diagnose cause of altered mental status. Describe clinical presentation of PRES (Posterior Reversible Encephalopathy Syndrome). Discuss clinical aspects of PRES including radiographic features, treatment, and prognosis.

Case Description #1: A 60 year old female with PMH Depression presented with confusion, disheveled appearance, and extreme agitation requiring medical sedation and eventual intubation. She had elevated blood pressure and Head CT scan findings consistent with decreased attenuation in occipital areas concerning for PRES. Patient also suffered acute onset of stress cardiomyopathy (Takotsubo's) and eventually passed away from her severe cardiac and neurologic insults.

Case Description #2: A 40 year old female with PMH HTN presented with initial headache and confusion that progressed to severe agitation requiring medical sedation and intubation. Of note patient had elevated blood pressure at initial presentation. Pt had extensive work up including a Brain MRI showing T2 signal abnormalities in all lobes of the cerebral cortex concerning for PRES. Pt had a negative work up for vasculitis, infectious, and immunologic etiologies including a brain biopsy. This patient recovered well and eventually was discharged home after brief medical rehabilitation.

Discussion: PRES is a neurotoxic state with a clinical syndrome that is often seen in association with hypertension. It is a poorly understood clinical phenomenon with a variable presentation, controversial pathophysiology, and varied radiographic descriptions. Early recognition of PRES is vital for clinical recovery. The two cases in this series describe hard to diagnose presentations, which emphasizes the importance of keeping PRES on the long differential for causes of altered mental status and agitation.

Notes:

PV42

AORTIC DISSECTION BY COITIS: A CASE REPORT

IA Siddiqui, E Levin, A Hidalgo

Learning Objectives: The purpose of this case is to highlight the varying and unique presentations of aortic dissection and the importance of prompt recognition and treatment.

Case Information: Aortic dissection has varying presentations depending on type and extent, ranging from sudden, intense pain in the interscapular region to myocardial infarction, stroke, or a pulseless limb. Here we present the case of a 48 year old male who presented as a transfer from an outside facility with a history of intermittent unresponsiveness, slurred speech, and confusion following severe back pain during intercourse. On presentation he was found to be afebrile with normal heart rate however hypotensive. A CT head showed possible basal artery thrombus. Further imaging included MRI/MRA brain which demonstrated multiple tiny subacute infarcts in the bilateral cerebellum and right cerebral hemisphere, however had poor visibility of the basal artery. A CTA neck was done to further illicit the basal artery and subsequently showed an extensive type A aortic dissection. A complete CT chest and abdomen demonstrated extensive dissection involving the aortic arch, right brachiocephalic artery and into right and left common carotid artery and left subclavian artery, as well as distally through the abdominal aorta involving the superior mesenteric and celiac arteries, and bilateral common iliac, external, and internal iliac arteries. The patient went to emergent surgery with resection and grafting of ascending aorta. After several days of monitoring, the patient was sent to rehabilitation where was noted to become hypoxic with desaturations in the 80's and was subsequently diagnosed with a saddle embolism via CTA of chest. He was treated with anticoagulation and sent back to rehab. He is currently still participating in rehab and can now walk with the help of a walker.

Summary: Diagnosis of aortic dissection requires a high index of suspicion given its wide variation in clinical presentation. In our case we illustrate an unusual presentation of dissection during coitus with symptoms of altered mental status. This case demonstrates the importance of a physical exam, accurate history, and prompt review of proper imaging studies.

Notes:

PV43

SIMULTANEOUS PULMONARY AND PARADOXICAL EMBOLI WITH IMPENDING PARADOXICAL EMBOLUS (IPDE); A RARE PRESENTATION.

M Rizwan, S Chalise, M Al-Janabi, N Sultana, Z Rehman

Learning objects: IPDE carries a high mortality of about 18%. Two thirds of patients die within the first 24 hours. Management is highly individualized and optimal approach depends on patient's characteristics and facilities available. A multidisciplinary approach is recommended to achieve best results.

Case report: 55 year old male, never smoker with hypertension, presented to ER with progressive shortness of breath of one week. He complained of paresthesias and feeling of coldness in left upper extremity and right foot. Patient's vitals were stable. On physical examination, patient had cold left hand, absent left brachial and radial pulses, and diminished right dorsalis pedis pulse. Labs were within normal limits. CT Angiogram of the chest showed extensive bilateral thromboembolic disease. DVT of right lower extremity was confirmed by Doppler studies. Vascular surgery recommended medical management of non-limb-threatening ischemia of left upper and right lower extremities. Therapeutic LMWH was initiated. TTE showed a large, mobile, echodensity in the right atrium that appeared to extend across the interatrial septum. TEE revealed patent foramen ovale(PFO) without thrombus (thrombus likely dislodged). Soon after, patient developed massive right middle cerebral artery stroke. Percutaneous PFO closure was done and an IVC filter was placed. Later during the day, patient became obtunded. Emergent right hemicraniectomy was performed. Afterwards, right frontal lobectomy and strokectomy was done for worsening cerebral edema. Post operatively patient's neurological status improved and transferred to acute rehab facility.

Discussion: IPDE presents as isolated PE in 50% of the cases, combined PE and PDE in 40%, and isolated PDE in the remaining patients. PDE commonly manifests as stroke, brain abscess and limb ischemia. Occasionally coronary, retinal, renal or splenic arteries are involved. PFO is the most common defect described. TEE is superior to TTE and MRI for diagnosis. Definite diagnosis is only by the evidence of thrombus entrapped through the PFO or by autopsy. When found, IPDE, require emergent thromboembolectomy. Recently, percutaneous thrombectomy has been used successfully⁴. Alternate therapies include thrombolysis and systemic anticoagulation. To prevent recurrence, systemic anticoagulation and percutaneous or surgical closure of the intracardiac defect is indicated

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A CASE OF SARCOIDOSIS PRESENTING WITH FOOT DROP

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Learning Objectives: Sarcoidosis is an inflammatory disease, it can affect any organ but most commonly affects the lungs, eyes and skin. Bone involvements as well as neurosarcoidosis are uncommon, especially without pulmonary manifestations. Bone marrow involvement and foot drop are rare. We present a case who had peripheral neuropathy manifesting with bilateral foot drop and weight loss, he was found to have bone marrow involvement, all with no symptoms or signs of pulmonary sarcoidosis.

Case: 46 year old male presented with generalized weakness, 70 lb weight loss over a year, bilateral lower extremity numbness, tingling and weakness. Exam showed clubbing and bilateral foot drop. His labs showed WBC 1.7 k/ul, an elevated ACE 186U/L (Ref 9-67), Ca levels were normal, CXR was normal. His presentation was concerning for malignancy and so further imaging was ordered. A CT scan chest, abdomen and pelvis showed: A 7 mm left lung nodule, no hilar or mediastinal lymphadenopathy, no pulmonary infiltrates, splenomegaly, hepatic steatosis, and adenopathy of the gastroesophageal junction. PET CT showed: Multiple sites of abnormal metabolic activity within osseous structures including the sternum, right posterior iliac bone, the sacrum and scattered foci throughout the spine, as well as lymphadenopathy at the level of the gastroesophageal junction and porta hepatis with a lower metabolic activity. A bone marrow aspiration and biopsy revealed non-necrotizing epithelioid granulomas, with no fugal, tuberculous or malignant elements. He was started on oral steroids, with close follow up. During the following 2 months he had gained 20 lbs, had increase of his strength to where he could walk again, and his WBC increased to normal. He developed DM and so the steroid was slowly tapered to a lower dose and he was started on methotrexate.

Summary: Sarcoidosis diagnosis is based on finding non-caseating granulomas on a tissue biopsy and excluding other causes. When the skeletal system is involved there is usually pulmonary and/or skin involvement as well. Bilateral foot drop, bone and bone marrow involvement are rare. In these cases it may be a diagnostic challenge and it requires thorough investigation and a high index of suspicion.

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