2020
WOMEN IN MEDICINE AND SCIENCE SYMPOSIUM

BRIGHAM HEALTH
BWH BRIGHAM AND WOMEN'S
Center for Diversity & Inclusion
Office for Women's Careers

September 30 | 2020

Women in Medicine and Science Symposium

September 30, 2020

3:30 - 5:30 pm

2020 Program

Welcome and Opening Remarks

Kathryn Rexrode, MD, MPH
Director, Office for Women's Careers, CDI
Chief, Division of Women's Health
Associate Professor of Medicine, HMS

Elena Aikawa, MD, PhD, FAHA
Director, Vascular Biology Program, CICS, BWH
Director, Heart Valve Translational Research Program
Professor of Medicine, HMS

Keynote Speaker - The Five Times I (Almost) Quit and Why I'm Happy I Didn't

Dr. Daphne Haas-Kogan, MD
Professor, Radiation Oncology, Harvard Medical School
Department Chair, Radiation Oncology, Brigham and Women's Hospital, Dana-Farber Cancer Institute

Featured Oral Presentations

Siobhan Case, MD, MHS
Clinical Fellow
Division of Rheumatology, Inflammation and Immunity
Department of Medicine

Oluremi Ajala, MD, MPH
Research Fellow
Division of Preventative Medicine
Department of Medicine

Stefanie Mason, MD
Research Fellow
Division of Pulmonary and Critical Care Medicine
Department of Medicine

Inga-Marie Schaefer, MD
Instructor
Division of Anatomic Pathology
Department of Pathology

Featured Lightning-Round Presentations

Anna Poon, PhD
Postdoctoral Fellow
Division of Women's Health
Department of Medicine

Vesela Kovacheva, MD, PhD
Assistant Professor
Division of OB Anesthesia
Department of Anesthesia

Rakhshinda Rehman, PhD
Research Fellow
Division of Pulmonary and Critical Care Medicine
Department of Medicine

Pranali N. Shah, PhD
Postdoctoral Research Fellow
Divito Lab
Department of Dermatology

Ashwini Nadkarni, MD
Instructor
Department of Psychiatry

Christina Liu, MD
Resident
Harvard Combined Orthopaedic Residency Program
Department of Orthopaedic Surgery

What Women Faculty, Trainees, and Students say about WMSS...

"The first thing about empowerment is to understand that you have the right to be involved, the second one is that you have something important to contribute and the third is that you have to take the risk to contribute to it." A quote from Mae Jemison, the astronaut, doctor and first African American woman in space. To me, this statement represents the core values of WMSS, **a chance to empower women, validate our commitment to science and build our community based on courage and mutual support**.

Women in Medicine and Science face unique challenges, particularly when it comes to balancing personal and professional responsibilities. This symposium represents an opportunity for women to **demonstrate scientific and research leadership**.

I see mentorship and education as pathways to foster thoughtful, collaborative physicians who in turn serve as educators for patients.Celebrating women’s voices at this symposium is an **empowering acknowledgement** that our contributions to our patients and within academic medicine are valued.

For me, this symposium is to celebrate women like my mother who is a dermatologist but also a single mother of two children; **women who pursued their passions despite adversities** and society's expectations.

Opportunities like this symposium serve as fundamental reinforcements that we do have a voice, and that **our contributions matter**.

From the President

Dear Colleagues,

I'm delighted to welcome you to the 2020 Women in Medicine & Science Symposium, which marks the Brigham's eighth anniversary of celebrating the outstanding achievements in research made by women at our hospital. The Brigham has a rich history of extraordinary female faculty, and I want to offer my heartfelt thanks to you for your tireless efforts to push the boundaries of science and carry this legacy forward.

My hope is that today's symposium will energize you and generate new ideas and collaborative opportunities with your fellow colleagues.

The Brigham is your academic home, and it is important to me that you can grow professionally and feel a sense of belonging at our institution. I encourage you to engage with the many Brigham resources available to support your personal and professional development, including the Center for Diversity and Inclusion (CDI), the Office for Women's Careers (OWC), the Office for Research Careers (ORC), the Brigham Research Institute (BRI) and the Connors Center for Women's Health and Gender Biology, all of which are sponsors of today's event.

Please enjoy the outstanding diversity of research presented during today's program - thank you for your own contributions to medicine, science and our health care community.

With warm regards,

Elizabeth G. Nabel, MD
President, Brigham and Women's Health Care

From the OWC Director

Dear Colleagues,

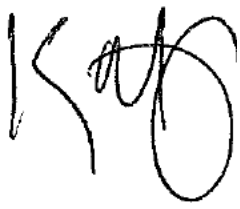
On behalf of the Center for Diversity & Inclusion (CDI), I would like to welcome you to the ninth annual Women in Medicine & Science Symposium. I want to personally acknowledge and celebrate the contributions of our women clinicians, scientists and researchers. You are all part of a group of exemplary individuals that reflects the great diversity of science, extraordinary range of talents and wonderful collaborative spirit at the Brigham and Women's Hospital.

The goal of the Women in Medicine & Science Symposium is to celebrate the contributions of women researchers and scientists in scientific discovery and clinical innovation. BWH is proud to support and advance some of the most important basic, translational, epidemiological and clinical research studies in the world, and to continue to support the advancement of women.

I would like to thank the Center for Diversity & Inclusion, the Office for Research Careers, the Brigham Research Institute and the Mary Horrigan Connors Center for Women's Health & Gender Biology for their support.

Your efforts are critical to our institution's mission and success, and I am delighted to be able to honor your research accomplishments, and most importantly, the energy and commitment that you bring to your work every day. Thank you so much for all that you do in advancing knowledge and training the next generation.

Sincerely,



Kathryn Rexrode, MD, MPH
Chief, Division of Women's Health
Director, Office for Women's Careers
Center for Diversity & Inclusion
Associate Professor of Medicine, HMS

From the Event Chairs

Elena Aikawa, MD, PhD, FAHA
Director, Vascular Biology Program, CICS, BWH
Director, Heart Valve Translational Research Program
Professor of Medicine, HMS

This year we celebrate our ninth Women in Medicine and Symposium (WMSS). Since our inaugural meeting in 2012, WMSS has provided a platform to recognize female clinical and research scientists from different departments and of varying academic ranks. WMSS has also fostered the initiation of numerous cross-departmental collaborations, the establishment of many mentor-mentee relationships, and allowed participants to share innovative discoveries with the entire Brigham community.

We would like to thank our reviewers for taking the time to ensure that each submitted abstract received fair consideration and acknowledge the members of OWC for their tremendous effort in organizing these meetings. We wish to thank Dr. Daphne Haas-Kogan, this year's keynote speaker, for her support of women's leadership and innovation. Please join us today in applauding the clinical and research achievements of women trainees and faculty at BWH, all of whom have worked to bridge the gender gap in academic medicine.

Kathryn Rexrode, MD, MPH
Chief, Division of Women's Health
Director, Office for Women's Careers
Center for Diversity & Inclusion
Associate Professor of Medicine, HMS

The Women in Medicine and Science Symposium allows us to recognize the many contributions that our women scientists, researchers, clinicians and trainees are making in scientific discovery, innovation and clinical collaboration. We hope to advance collaboration by creating a forum to share and celebrate the scientific and clinical achievements of our talented women faculty.

Keynote Speaker

Daphne Haas- Kogan, MD, is chair of the Department of Radiation Oncology at Dana-Farber Cancer Institute, Brigham and Women's Hospital and Boston Children's Hospital. She is a professor of Radiation Oncology at Harvard Medical School.

Dr. Haas-Kogan received her undergraduate degree in Biochemistry and Molecular Biology *magna cum laude* from Harvard University, was elected to Phi Beta Kappa, received prestigious Joseph L. Barrett Award for Teaching at Harvard University, and was awarded the Thomas T. Hoopes Prize and *summa cum laude* for her Senior Honors Thesis. While in medical school, she was an HHMI Medical Fellow in the laboratory of Dr. J. Michael Bishop at UCSF. She received her M.D. from the University of California, San Francisco and was elected to the Alpha Omega Alpha Medical Honor Society. She completed her residency in Radiation Oncology and post-doctoral fellowship in molecular neuro-oncology at UCSF in 1997. She remained at UCSF as a tenure track faculty member with joint appointments in Radiation Oncology and Neurological Surgery, was Vice-Chair for Research since 2003, and Educational Program Director since 2008. All the while she has maintained a productive, well-funded basic science laboratory in which she investigates signaling aberrations in human cancers, including adult and pediatric brain tumors.

Dr. Haas-Kogan's laboratory research has focused on characterizing aberrant signaling pathways in gliomas and investigating agents that target these signaling cascades. Dr. Haas-Kogan has been the Principle Investigator on many grants funded by the NIH/NCI, philanthropic organizations, and industry collaborations. Dr. Haas-Kogan has been selected as one of the top physicians in the United States by several publications included Best Doctors in American, San Francisco Magazine, and Consumers' Research Council of America. She has received several teaching awards including the Henry J. Kaiser Award for Excellence in Teaching from UCSF School of Medicine. Dr. Haas-Kogan continues to successfully lead and perform laboratory research, design clinical trials, establish robust collaborations with neuro-pathologists, neuro-oncologists, and neuro-radiologists, and develop a thriving clinical practice in radiation oncology. In 2019, Dr. Haas-Kogan was elected to the National Academy of Medicine and was awarded a Fellowship by the American Society of Radiation Oncology. In 2016, Dr. Haas-Kogan was appointed to the Blue Ribbon Panel of Scientific experts, cancer leaders, and patient advocates that will inform the scientific direction and goals at NCI of former Vice President Joe Biden's National Cancer Moonshoot Initiative.

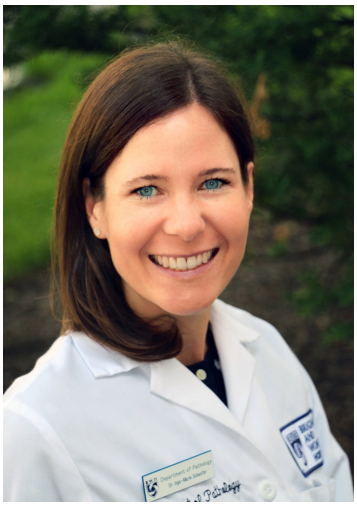
As chair of the Department of Radiation Oncology, her vision includes supporting each member of the Radiation Oncology Department in fostering close collaborative ties with diagnostic radiologists, medical and pediatric oncologists, surgeons, pathologists, and basic science investigators to spearhead cutting edge science, translational investigations and clinical studies, all based on the depth and breadth of success that already permeates Dana-Farber/Brigham and Women’s Cancer Center (DFBWCC). DFBWCC excels in all areas of academic medicine, including research, education, and clinical care, and Dr. Haas-Kogan aims to maintain and further develop a Radiation Oncology Department that remains at the forefront in all aspects of radiation oncology and academic medicine.

Featured Oral Presenters

Siobhan Case, MD, MHS
Clinical Fellow
Division of Rheumatology, Inflammation and Immunity
Department of Medicine

Oluremi Ajala, MD, MPH
Research Fellow
Division of Preventative Medicine
Department of Medicine

Stefanie Mason, MD
Research Fellow
Division of Pulmonary and Critical Care Medicine
Department of Medicine



Inga-Marie Schaefer, MD
Instructor
Division of Anatomic Pathology
Department of Pathology

Featured Lightning-Round Presenters

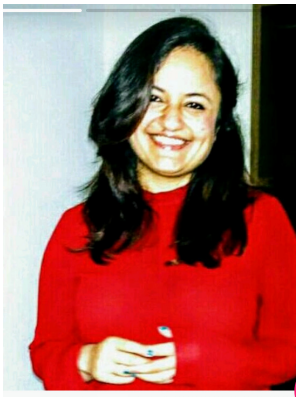
Vesela Kovacheva, MD, MPH
Assistant Professor
Division of OB Anesthesia
Department of Anesthesia

Christina Liu, MD
Resident
Harvard Combined Orthopaedic Residency Program
Department of Orthopaedic Surgery

Ashwini Nadkarni, MD
Instructor
Department of Psychiatry

Anna Poon, PhD
Postdoctoral Fellow
Division of Women's Health
Department of Medicine

Rakhshinda Rehman, PhD
Research Fellow
Division of Pulmonary and Critical Care Medicine
Department of Medicine



Pranali N. Shah, PhD
Postdoctoral Research Fellow
Divito Lab
Department of Dermatology

Abstracts

Post-Traumatic Stress Disorder (PTSD) and Risk of Systemic Lupus Erythematosus (SLE)

Submitted by: Case, Siobhan, MD, MHS
Authors: Candace H. Feldman, MD, ScD; Hongshu Guan, PhD; Laura D. Kubzansky, PhD, MPH; Karestan Koenan, PhD; Karen H. Costenbader, MD, MPH

Background: Post-traumatic stress disorder (PTSD), the sentinel stress-related mental disorder, may be associated with increased risk of developing autoimmune disease, including systemic lupus erythematosus (SLE). This study aimed to study the relationship between PTSD and risk of SLE in a large, diverse population of Medicaid enrollees. We hypothesized patients with incident SLE would be more likely to have a prior diagnosis of PTSD than those without SLE.

Methods: We performed a case-control study using patients ages 18 to 65 years old in the Medicaid Analytic eXtract (MAX) database between January 1, 2007 and December 31, 2010. Cases of SLE were defined as having >3 ICD-9 codes for SLE from hospital discharge diagnoses or physician visit claims, occurring at least 30 days apart. Index date was defined as the date of the first code for SLE. Controls were matched to SLE cases for age, sex and race using a 1:10 ratio. Controls were patients without any claims for SLE, but who had another inpatient or outpatient claim in Medicaid on the SLE index date of the matched case. Exclusion criteria included having less than 12 months of continuous Medicaid enrollment prior to the index or matched control date. The exposure was PTSD, defined as having >2 ICD-9 codes for PTSD on different dates within 4 months of each other, occurring prior to the index date for SLE (Gravely, 2011; PPV 82%). We used conditional logistic regression to calculate the odds ratio (OR) and 95% confidence interval (CI) for history of PTSD prior to index date in cases vs. controls. Finally, we used multivariable analysis to adjust for variables collected prior to the index date, including area-level socioeconomic status (SES), smoking, obesity, oral contraception use, and time enrolled in Medicaid.

Results: We identified 10,942 cases of incident SLE, who were matched to 109,420 controls. There were significant differences at the index date in several characteristics, including zip code level income as a measure of socioeconomic status (SES), US region of residence, smoking, obesity, and oral contraceptive use (Table 1). 1.46% of Medicaid enrollees with SLE met the definition of PTSD prior to the index date, compared to 0.75% of controls ($p<0.001$). The OR for PTSD and risk of incident SLE was 1.96 (95% CI 1.66-2.33, $p< 0.001$) in conditional logistic regression, and 2.02 (95% CI 1.65-2.48, $p<0.001$) after multivariable adjustment (Table 2). Further adjustment for the matching factors did not alter risk estimates.

Conclusions: In this large, racially and sociodemographic diverse US patient population, we found a near doubling of odds of SLE associated with prior PTSD diagnosis. Chronic stress leading to hypothalamic-pituitary axis dysregulation and inflammatory cytokine upregulation are postulated mechanisms. Future studies are needed with longer follow-up time to clarify the underlying pathophysiology and characterize modifying influences in the relationship between PTSD and SLE.

Abstracts

Determinants of Statin Response in the Pravastatin Inflammation/CRP Evaluation (PRINCE) Trial

Submitted by: Ajala, Oluremi, MD, MPH
Authors: Olga Demler, Yanyan Liu, Paul Ridker, Robert Glynn, Daniel Chasman, Michelle Albert, Samia Mora

Background: Wide variability in LDL-C change is observed with statins, yet determinants of statin response are uncertain.

Methods: Participants were selected from the primary prevention cohort of the Pravastatin Inflammation/CRP Evaluation (PRINCE) double-blind trial that randomized participants to pravastatin 40 mg/d or placebo over 24 weeks. Baseline and 24-week follow-up levels of LDL-C and 15 biomarkers were measured in 495 participants. We defined optimal statin response as ≥30% and suboptimal response as <30% reduction in LDL-C. x2, t-tests and ANOVA were used to compare variables across optimal (N=181) and suboptimal (N=272) response. Logistic regression models evaluated associations of determinants of statin response. Backward selection identified variables that associated with response. Xgboost was used to train and validate the models.

Results: Significant determinants of better response included higher baseline levels of LDL-C and glucose. By contrast, higher baseline levels of lipids [apo B, lipoprotein(a)], branched-chain amino acids, and diastolic blood pressure associated with decreased response (Table). Training and validation of models, and Xgboost predicted suboptimal response with an AUC of 0.80 and 0.83 respectively.

Conclusions: This study identified determinants of moderate-intensity statin response and suggests other pathways of CVD risk beyond those addressed by statin treatment that require future investigation.

Abstracts

Novel Artificial-Intelligence-Powered Algorithm to Personalize Hemodynamic Management in Patients Presenting for Cesarean Delivery Under Spinal Anesthesia

Submitted by: Kovacheva, Vesela, MD, PhD
Authors: Raphael Cohen, B.S.; William Lawrence Armero, B.S.; Yun-Yun Chen, M.D.; Katherine Andriole, Ph.D.

Background: Hypotension after spinal anesthesia occurs in up to 74.1% of cesarean deliveries (CD) and the current guidelines recommend starting a vasopressor, phenylephrine, prophylactically. We used artificial intelligence (AI) methods to attain hemodynamic stability in healthy patients.

Methods: We annotated a cohort of 1400 patient records. We used partial differential equation to inject physiological information into a model for systolic blood pressure (SBP) prediction. With the forecast of the patient's SBP, the model itself was subsequently used to predict the optimal amount of phenylephrine

Results: Using 300 retrospective records not used in the model, the model was able to predict SBP<90 mmHg with sensitivity 0.997 and specificity 0.965. We developed a software application that predicts SBP and phenylephrine dose every minute. We demonstrate the decision making of the algorithm and empower the physician to take care of patients even with conditions that were not present in the training cohort.

Conclusions: Our AI-powered algorithm can increase the safety and well-being of millions of mothers and babies annually. In the long run, we plan to create an automated system able to deliver personalized drug infusions, thus increasing safety, decreasing cost of care and, ultimately, transforming the way we perform anesthesia.

Abstracts

Respiratory exacerbations are associated with accelerated muscle wasting

Submitted by: Mason, Stefanie, MD
Authors: Rafael Moreta-Martinez; Matthew J. Strand, PhD; Ruben San Jose Estepar, MS; Raul San Jose Estepar, PhD; George R. Washko, MD

Background: We sought to explore the relationship between respiratory exacerbations and long-term muscle loss using serial measurements of pectoralis muscle area (PMA).

Methods: PMA was measured on chest computed tomography scans at two timepoints using a deep learning algorithm. Linear mixed effects models were used to fit PMA longitudinally in 1,332 participants from ECLIPSE and 4,384 participants from COPDGene who had complete data from their baseline and follow-up visits. Self-reported exacerbation data were collected from participants in both studies through the use of periodic longitudinal surveys.

Results: Age, sex, race, and body mass index were associated with baseline PMA. Participants experienced age-related decline at the upper end of reported normal ranges. In ECLIPSE, the exacerbation rate over time was associated with an excess muscle area loss of 1.3% (CI 0.7-1.9, $p<0.001$) over three years and in COPDGene with an excess muscle area loss of 2.1% (CI 1.5-3.0. $p<0.001$) over five years. Excess muscle area decline was absent in 271 individuals who participated in pulmonary rehabilitation.

Conclusions: Exacerbations are associated with accelerated skeletal muscle loss. Each annual exacerbation was associated with an additional 0.5 times a participant's age-expected decline in muscle mass. Ameliorating exacerbation-associated muscle loss represents an important therapeutic target.

In-Situ Detection of SARS-CoV-2 in Lungs and Airways of Patients with COVID-19

Submitted by: Schaefer, Inga-Marie, MD
Authors: Robert F. Padera, Isaac H. Solomon; Sanjat Kanjilal, Mark M. Hammer; Jason L. Hornick; Lynette M. Sholl

Background: Coronavirus disease 2019 (COVID-19) caused by SARS-CoV-2 has led to a global public health crisis. In elderly individuals with comorbidities, COVID-19 is associated with high mortality, frequently caused by respiratory failure. We examine in-situ expression of SARS-CoV-2 in airways and lungs obtained at autopsy of individuals with COVID-19. Methods: 7 autopsy cases (male, N=5; female, N=2) with RT-PCR-confirmed SARS-CoV-2 infection and a median age of 66 (range, 50-77) years were evaluated using an anti-SARS Nucleocapsid protein antibody in correlation with clinical parameters.

Methods: 7 autopsy cases (male, N=5; female, N=2) with RT-PCR-confirmed SARS-CoV-2 infection and a median age of 66 (range, 50-77) years were evaluated using an anti-SARS Nucleocapsid protein antibody in correlation with clinical parameters.

Results: The median time from symptom onset to death was 9 (6-31) days, from hospitalization 7 (1-21) days, from RT-PCR 7 (0-18) days, and from onset of respiratory failure 3 (1-18) days. Imaging identified diffuse airspace disease corresponding to acute (N=5) or organizing (N=2) diffuse alveolar damage (DAD). Among 5 patients with acute-phase DAD (£7 days from onset of respiratory failure), SARS-CoV-2 was detected in pneumocytes and airway cells (N=5), and in upper airway epithelium (N=2). No virus was detected in 2 patients with organizing DAD.

Conclusions: SARS-CoV-2 infection of lung and airway epithelium in patients with COVID-19 who developed respiratory failure is detectable during the acute phase of lung injury and absent in the organizing phase.

Abstracts

Similar 15-year Survivorship for Single and Bilateral Total Knee Arthroplasty (TKA)

Submitted by: Liu, Christina, MD
Authors: Nathan Varady, BS; Brielle Antonelli, BS; Thomas Thornhill, MD; Antonia Chen, MD, MBA

Background: The purpose of this study was to compare implant survivorship between primary single and bilateral TKA to provide accurate updates to guide patient expectations.

Methods: This retrospective study included 826 patients (1090 TKA) who underwent primary single (n=454), simultaneous bilateral (n=266), or staged bilateral (n=370) TKA using Sigma® Total Knee System (DePuy Synthes, Warsaw, IN, USA) by a single surgeon from 1991-2005 with 15-year minimum follow-up. Demographics, clinical variables, and surgical outcomes were collected and compared using Student's t-test, chi-squared tests, or Kaplan-Meier analyses, as appropriate.
Reoperation was defined as all surgeries performed after the index procedure; revision TKA was defined as complete implant exchange. $p<0.05$ was significant.

Results: Patients in the staged cohort were younger (65.4 years=staged, 67.8=simultaneous, 67.1=single,$p<0.019$). Women were less likely to receive simultaneous TKAs (22%vs.29%,$p<0.001$). Postoperative range of motion was similar (116.8°=simultaneous, 114.9°=staged, 114.8°=single,$p=0.11$). Overall 15-year implant survival based on revision TKA was similar (97.7%=simultaneous, 97.2%=staged, 96.7%=single,$p=0.45$). The estimated 15-year reoperation rate was 7.0% (95% CI,5.5%-8.7%). Reoperations were secondary to infection (35.5%), implant wear (26.3%), arthrofibrosis (18.4%), traumatic injuries (10.5%), pain (6.6%), pathologic lesion (1.3%), and
avascular necrosis (1.3%).

Conclusions: This study demonstrated a high implant survival rate of 96-97% at 15-20 years after single and bilateral TKA.

Abstracts

Understanding Drivers of Perceived Appreciation to Develop Strategies for Physician Burnout

Submitted by: Nadkarni, Ashwini, MD
Authors: Elizabeth Harry, MD; Heidi Kimberly MD; Scott Schissel MD; Maria DeOliveira; Amy Jackson; Cathy Giess MD; Stanley Ashley, MD; Jessica Dudley, MD

Background: Physician burnout remains a prevalent and worrying phenomenon across the country, an issue further brought to the forefront by the Covid-19 pandemic.

Methods: To clarify the drivers of perceived appreciation and faculty well-being at a large, academic health center we conducted a two-question, open-ended response survey among clinical faculty in five departments. We additionally collected two demographic questions which included gender and department identity. We utilized grounded theory methodology to analyze the narrative responses.

Results: A total of 179 faculty respondents filled out the survey for an overall response rate of 29%. Major drivers of perceived appreciation were patient and families (42%); physician, trainee and non-physician colleagues (32.7%); chairs (10%); and compensation (3.3%). Major drivers of perceived lack of appreciation were disrespect for time and skill level, including inadequate staffing (34%), devaluation by a physician colleague, chief of one's service or the chair (33%); poor communication and transparency (15%); and patient and family anger (7%).

Conclusions: Drivers of perception of appreciation and lack of appreciation highlight the importance of implementing interventions to boost a culture of wellness to address physician burnout. Opportunities include structured communication of patient gratitude, peer support programs, top of licensure initiatives and accountability for physician wellness from organizational leaders.

Abstracts

Child abuse and adult cardiovascular disease: mediation by post-traumatic stress disorder and depression

Submitted by: Poon, Anna, PhD
Authors: Jennifer J Stuart; Karestan C Koenen; Laura D Kubzansky; Andrea Roberts; Janet W. Rich-Edwards

Background: Childhood physical and sexual abuse are associated with cardiovascular disease (CVD) in adulthood. The contribution of post-traumatic stress disorder (PTSD) and depression remains unknown.

Methods: We included 49,337 women followed from 1989-2015 in the Nurses' Health Study 2. Physical abuse before age 18 was defined as none, mild, moderate, or severe. Sexual abuse before age 18 was defined as none, sexual touching, or forced sex. PTSD was defined by trauma history and ≥4 symptoms. Depression was assessed by self-reported symptoms and report of symptoms to a clinician. CVD was confirmed by medical record review. We used hazard ratios to estimate the effect of child abuse on CVD, then used the difference method to estimate the proportion of this effect mediated by PTSD and depression.

Results: Women with vs without a history of severe physical abuse had a 37% higher rate of CVD (CI:1.09-1.72); PTSD and depression accounted for 61% (CI: 24-88%) of this association. Women with vs without a history of forced sex had a 39% higher rate of CVD (CI: 1.13-1.71); PTSD and depression accounted for 50% (CI: 26-75%) of this association.

Conclusions: Among women with a history of abuse, PTSD and depression may exacerbate CVD risk.

Abstracts

Regulation of Mitochondrial Dynamics (Mitophagy) via Yap/Taz signaling in Pulmonary Arterial Hypertension

Submitted by: Rehman, Rakhshinda, PhD
Authors: Shamsudheen Karuthedath Vellarikkal; Hilaire Lam; Charilaos Filippakis; Paul B. Dieffenbach; Nathan Kingston3; Xaralabos Varelas; Laura E. Fredenburgh

Background: Abnormalities in mitochondrial metabolism i.e. metabolic shift from glucose oxidation to glycolysis are well known to occur in pulmonary arterial hypertension (PAH). This Warburg effect promotes proliferation and resistance to apoptosis in pulmonary vascular cells in PAH. However, there is limited understanding of mitochondrial dynamics dysregulation in PAH. We hypothesized that Yes-associated protein (YAP) and Transcriptional activator with PDZ-binding motif (TAZ), key regulators of cellular proliferation and apoptosis, may regulate mitochondrial dynamics in PAH.

Methods: PASMCs were isolated from Rosa26-CreYAPflox/floxTAZflox/flox and Rosa26-Cre Control C57BL/6J mice and treated with 4-hydroxytamoxifen for different durations (1-6 days). Mitochondrial shape, content and activity were assessed using TMRM, Mitotracker Green, and Tom20 staining by imaging and flow cytometry (FC). Drp1 and Mfn2 expression were assessed by Western blot in PASMCs stably overexpressing constitutively active TAZ(TAZ4SA), YAP(YAP5SA), and control vector(pLVX-Puro).

Results: YAP/TAZ-deleted PASMCs showed significantly decreased Drp1and Mfn2 expression compared to Cre-Control PASMCs. YAP/TAZ deficient cells showed reduced TMRM vs Mitotracker-green intensity ratio indicative of lower membrane potential. TAZ4SA stably transformed PASMCs demonstrated an increase in Drp1 but decrease in Mfn2 expression compared to pLVX-Puro cells, whereas there was a reduction in both Drp1 and Mfn2 expression in YAP5SA cells. PASMCs from PAH patients showed an increase in Drp1 expression compared to control donor PASMCs, and YAP/TAZ knockdown reduced Drp1 expression in PAH PASMC.

Conclusions: YAP/TAZ deficient PASMCs demonstrate significant mitochondrial depolarization, decreased mitochondrial mass, and reduced mitochondrial fission and fission, which may correlate with attenuated proliferation and increased apoptosis. Our findings suggest that YAP/TAZ may regulate mitochondrial dynamics via modulating Drp1 and Mfn2 expression in PASMC in PAH.

Investigating skin resident memory T cells in a mouse model of DRESS

Submitted by: Shah, Pranali, N., PhD
Authors: Pei-Chen Hsieh; Roderick T. Bronson; Sherrie J. Divito

Background: Drug Rash Eosinophilia and Systemic Symptoms (DRESS) is a severe cutaneous adverse reaction with high morbidity and mortality. Disease pathogenesis is poorly understood and research has been hampered by the lack of an available animal model.

Methods: A recently developed mouse model of DRESS employed C57BL/6 mice transgenically expressing human HLA-B*57:01 and treated with abacavir intraperitoneally (i.p.) and topically to induce ear dermatitis at the site of topical treatment. We have modified this model to investigate T cell activation, migration and function in disease pathogenesis.

Results: We observed clinically dermatitis and increased ear thickness in 100% of treated and contralateral untreated ears of HLA-B*57:01 mice administered abacavir i.p. and topically. Disease correlated activation of CD3+CD8+ T cells in draining lymph nodes and migration through blood with accumulation in both treated and untreated ears. CD8+ T cells expressed the skin homing molecule CLA (E-selectin+) as well as the activation phenotype CD44hi CD62LloCD69+ and produced the proinflammatory cytokines IFNg and TNFa and the cytotoxic molecule Granzyme B ex vivo. Disease resolved slowly in mice in parallel to human disease. Despite complete clinical and histologic resolution, a population of CD8+CD44hiCD62LloCD69+CLA+ T cells remained in treated and untreated ears even 90+ days later consistent with skin resident memory T cells. These cells were immunologically quiescent. HLA-B*57:01 negative mice treated with abacavir and HLA-B*57:01 positive mice treated with vehicle served as controls and failed to develop inflammation indicating T cell responses were drug and HLA-B*57:01 specific.

Conclusions: Taken together these data indicate that skin resident memory T cells develop as a result of drug/HLA specific DRESS-like dermatitis. We are currently testing whether these skin-resident memory T cells can mediate repeated episodes of DRESS-like dermatitis in response to drug, consistent with true drug allergy.

Honorable Mentions

High Glucose Environment Augments the Clonal Evolution of Hexokinase-2 Gene Copy Number Expression and Cellular Proliferation in Anaplastic Thyroid Cancer
Aggarwal, Abha, PhD
Division of Oncosurgery, Department of Surgery, Research Fellow

Breastfeeding Associated With Lower Prevalence of Metabolic Syndrome In Women With Gestational Diabetes in the Early Postpartum Period
Blair, Rachel, MD
Division of Endocrinology, Diabetes, and Hypertension, Department of Medicine, Clinical Fellow

Faculty and medical student perspectives on coproduction of clinical curricula: an international mixed-methods study of best practices in Longitudinal Integrated Clerkship (LIC)
Callahan, Dana, MD
Department of Medicine, Resident

Vitamin D Supplements and Advanced Cancer: A Randomized Clinical Trial
Chandler, Pauette, MD, MPH
Division of Preventative Medicine, *Department of Medicine, Assistant Professor*

PAX8-directed nanotherapeutics for high-grade serous ovarian cancer
Chandrasekaran, Akshaya, PhD
Division of Gynecologic Oncology, *Department of OB/GYN, Research Fellow*

Patterns of Palliative Care Among Patients with Metastatic Cancer Receiving Palliative Radiotherapy
Chen, Jie Jane, MD
Department of Radiation Oncology, Clinical Fellow

Development of a Novel Mentorship Platform to Foster Relational Mentoring and Professional Identity Formation in Undergraduate Medical Education
Chen, Jie Jane, MD
Department of Radiation Oncology, Clinical Fellow

ATP-binding cassette protein ABCF1 couples gene transcription with maintenance of genome integrity in embryonic stem cells
Choi, Eunbee, PhD
Division of Cardiovascular Medicine, *Department of Medicine, Research Fellow*

A Combination of Healthy Lifestyle Behaviors Reduce Risk of Incident Systemic Lupus Erythematosus in the Nurses' Health Studies
Choi, May, MD, FRCPC
Division of Rheumatology, Immunology & Allergy, Department of Medicine, Research Fellow

Honorable Mentions

In vivo printing of nanoengineered growth factor eluting hydrogel-based scaffolds for promoting muscle regeneration
Endo, Yori, MD, MPhil, BSc
Division of Wound Healing & Muscle Regeneration, Department of Surgery, Research Fellow

Lipoprotein(a) Cholesterol and Cardiovascular Events in the VITamin D and OmegA 3 TriaL (VITAL)
Farukhi, Zareen, MD, MPH
Division of Preventative Medicine, Department of Medicine, Instructor

Challenges and best practices for integrating Advanced Practice Providers (APPs) in an academic Department of Neurology: perspectives and experiences of current APPs
Gheihman, Galina, MD
Department of Neurology, Resident

Spectrum of Germline and Somatic Mitochondrial DNA Variants in Tuberous Sclerosis Complex
Giannikou, Krinio, BSc, MSc, PhD
Division of Pulmonary and Critical Care, Department of Medicine, Research Fellow

Geographic Distribution of Eosinophilic Fasciitis Cases in Massachusetts and Its Associated Etiologic Triggers
Kassamali, Bina, BA
Department of Dermatology, Medical Student

The First Genome-wide Association Study of Patients With Postpartum Hemorrhage Identifies Genetic Loci Related To Immunity And Cell Interactions
Kovacheva, Vesela, MD, PhD
Department of Anesthesia, Research Fellow Fellow

Refining the TEACHH model: Towards improved clinical utility in the modern era
Krishnan, Monica, MD
Department of Radiation Oncology, Assistant Professor

3D-printed ABCB5+ dermal stem cells for the treatment of limbal stem cell deficiency
Lee, Catherine, MS, MS, PhD
Division of Genetics, Department of Medicine, Research Fellow

Sex Differences In Outcomes After Arthroscopic Bankart Repair
Lowenstein, Natalie, BS
Division of Women's Sports Medicine, Department of Orthopedics, Clinical Research Coordinator

Hip Fracture Patients with Preoperative Echocardiograms Have Delayed Surgery and Poor Outcomes
Lu, Laura, MD
Department of Orthopedics, Resident

Honorable Mentions

Threshold Level for Long-term Healthy Diet Adherence to Reduce the Risk of Rheumatoid Arthritis Among Young Women in a Prospective Cohort using a Marginal Structural Model Approach
Marchand, Nathalie, ScD
Division of Rheumatology, Inflammation, and Immunity, Department of Medicine, Research Fellow

Survival outcomes of older adults (OA) receiving 2nd line therapy for metastatic CRC (2mCRC): 5289 patients (pts) from ARCAD Clinical Trials Program
McCleary, Nadine, MD, MPH
Gastrointestinal Cancer Center, Department of Medicine, Assistant Professor

Resource utilization rates among English vs. limited English proficient patients (pts) by patient-report of low health literacy (LHL)
McCleary, Nadine, MD. MPH
Gastrointestinal Cancer Center, Department of Medicine, Assistant Professor

Patient-reported outcomes (PROs) and emergency department (ED) visits among gastrointestinal (GI) cancer patients (pts) prescribed anti-CTLA4/PD-1/L-1 antibody immunotherapy
McCleary, Nadine, MD. MPH
Gastrointestinal Cancer Center, Department of Medicine, Assistant Professor

Developmental Genome Anatomy Project (DGAP): Classical Cytogenetics as a Crucial Tool for Locating Chromosomal Abnormalities
Nalbandian, Katarena, Pursuing a Doctor of Pharmacy Degree with a Minor in Public Health
Department of OB/GYN, Research Trainee

Initiation of SGLT-2 inhibitors in hospitalized patients with CVD and diabetes
Palermo, Nadine, DO
Division of Endocrinology, Diabetes, and Hypertension, Department of Medicine, Instructor

Use of SGLT2 inhibitors in hospitalized patients
Palermo, Nadine, DO
Division of Endocrinology, Diabetes, and Hypertension, Department of Medicine, Instructor

Efficacy of Autologous Micrografts in a Collagen-Glycosaminoglycan Scaffold for Murine Skin Wound Healing
Panayi, Adriana, MD
Division of Plastic Surgery, Department of Surgery, Instructor

Mammographic Positioning Quality in Women with Pectus Excavatum
Portnow, Leah, MD
Department of Radiology, Instructor

Honorable Mentions

Cognitive Impairment in Adults CHD Survivors: a pilot study
Rodriguez-Monserrate, Carla, MD
Division of Cardiology, Department of Medicine, Clinical Fellow

Prediction of Persistent Pain After Breast Cancer Surgery: towards Personalized Medicine for Prevention
Schreiber, Kristin, MD, PhD
Division of Anesthesiology, Perioperative and Pain Medicine, Department of Anesthesia, Assistant Professor

The Immunologic Complexity of Fixed Drug Eruptions
Schunkert, Elisa, MD
Department of Dermatology, Research Fellow

Women in Clinical Trials: National Analysis of ClinicalTrials.gov 2016-2019
Sosinsky, Alexandra, MS
Division of Pharmacoepidemiology and Pharmacoeconomics, Department of Medicine, Research Trainee

Prothymosin alpha (ProTα) associates with pathogenesis and sex predisposition in rheumatic heart valve disease
S.A. Passos, Livia, PhD
Division of Cardiovascular Medicine, Department of Medicine, Research Fellow

Contrasting the pathomechanisms of membrane versus cytosol alpha-synuclein excess
Tripathi, Arati, PhD
Department of Neurology, Research Fellow

Identification of key regulators of T-cell function with the use of CRISPR
Wacleche, Vanessa, PhD
Department of Medicine, Research Fellow

Trends in Gender Disparities in Authorship of Arthroplasty Research
Xu, Raylin, BA
Division of Arthroplasty, Department of Orthopedics, Research Fellow

Women in Medicine and Science Symposium 2020

BRIGHAM HEALTH
BWH BRIGHAM AND WOMEN'S
Center for Diversity & Inclusion
Office for Women's Careers

BRIGHAM HEALTH
BWH BRIGHAM AND WOMEN'S
Mary Horrigan Connors Center
for Women's Health and Gender Biology

BWH Office for
Research Careers

BRIGHAM HEALTH
BWH BRIGHAM
Research Institute

Special Thanks to our Abstract Review Committee

Kathryn Rexrode, MD, MPH
Director, Office of Women's Careers, CDI
Chief, Division of Women's Health, BWH
Associate Professor of Medicine, HMS

Elena Aikawa, MD, PhD, FAHA
Director, Vascular Biology Program, CICS
Director, Heart Valve Translational Research Program
Professor of Medicine, HMS

Laura E. Fredenburgh, MD
Faculty Director, Office for Research Careers, BWH
Assistant Professor of Medicine, HMS

Frederick J. Schoen, MD, PhD
Executive Vice Chairman, Department of Pathology
Professor of Pathology and Health Sciences and Technology, HMS

Hadine Joffe, MD, MSc
Excecutive Director, Mary Horrigan Connors Center for Women's Health and Gender Biology
Paula A. Johnson Associate Professor of Psychiatry in the Field of Women's Health, HMS
Vice Chair for Research, Department of Psychiatry