

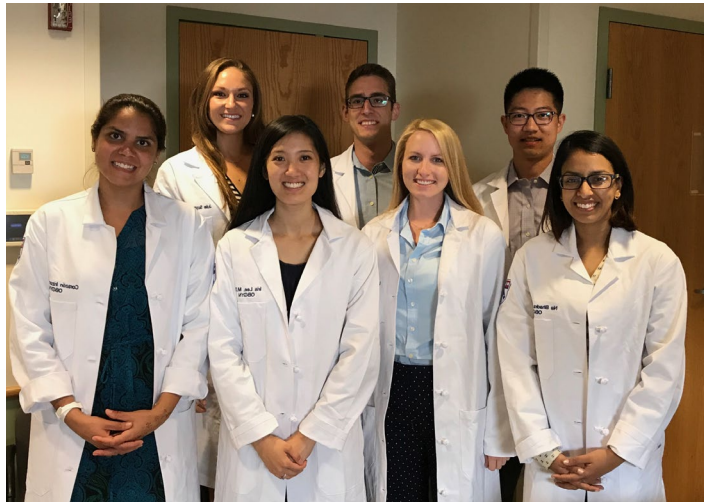


Penn Medicine

DEPARTMENT OF OBSTETRICS & GYNECOLOGY

18th Annual

RESIDENT RESEARCH DAY
& JOHN ROCK LECTURE



MAY 20, 2021

Welcome

18TH ANNUAL RESIDENT RESEARCH DAY & JOHN ROCK LECTURE

Welcome to the 18th Annual John Rock Lecture and Department of Obstetrics and Gynecology Resident Research Day. Resident Research Day is an opportunity for our trainees to present their research projects to their colleagues with the goal of challenging current thinking to improve women's health care. We believe this experience will inspire our young physicians to explore basic science, translational and clinical research opportunities in their future careers in order to benefit patients and advance our specialty.

We are honored to welcome as our speaker Arnold P. Advincula, MD, Levine Family Professor, Vice-Chair of Women's Health and Chief of Gynecology at the Sloane Hospital for Women, New York Presbyterian/Columbia University Irving Medical Center.

A special thank you to the Women's Health Clinical Research Center, The Penn Ovarian Cancer Research Center and The Center for Research on Reproduction and Women's Health.

We thank you all for your virtual attendance today and hope you will join us in congratulating all of today's participants on their achievements.

RESEARCH LEADERSHIP TEAM

Anuja Dokras, MD, PhD

Director, Resident Research Program

Catherine R. Salva, MD

Director, Residency Program

Elizabeth A. Howell, MD, MPP

Chair, Department of Obstetrics and Gynecology



JOHN ROCK LECTURER



Arnold P. Advincula, MD

Levine Family Professor

Vice Chair of Women's Health & Chief of Gynecology

Sloane Hospital for Women

New York Presbyterian/Columbia University Irving Medical Center

Dr. Advincula is a leader in minimally invasive surgical techniques and one of the world's most experienced gynecologic robotic surgeons. He has published and taught extensively in the area of minimally invasive surgery as well as developed surgical instruments in use worldwide. Dr. Advincula is a board certified obstetrician-gynecologist and a fellow of both the American College of Obstetricians and Gynecologists and the American College of Surgeons.

After graduating with honors from Temple University School of Medicine, Dr. Advincula completed an ob-gyn residency and a minimally invasive surgery fellowship at the University of North Carolina - Chapel Hill. He went on to spend 10 years at the University of Michigan where he rose to the rank of Professor. During his tenure there he served as Director of the Minimally Invasive Surgery Division and Fellowship. He also founded the Endometriosis Center at Michigan. In 2009, Dr. Advincula joined Florida Hospital Celebration Health as Director of the Center for Specialized Gynecology. While in Florida, he served as the Director of the Celebration Health Endometriosis Center and established an AAGL accredited Fellowship in Minimally Invasive Surgery. He was also Medical Director of Gynecologic Robotics at Florida Hospital, as well as Professor of Obstetrics & Gynecology at the University of Central Florida College of Medicine. Additionally, Dr. Advincula was the Education Institute Director of the Nicholson Center, an advanced medical and surgical simulation training facility in Celebration, Florida. Prior to leaving Florida Hospital, Dr. Advincula helped launch central Florida's first Women's Institute.

In 2014, Dr. Advincula accepted the position of Levine Family Professor, Vice-Chair of Women's Health & Chief of Gynecology at the Sloane Hospital for Women, Columbia University Irving Medical Center/New York Presbyterian Hospital. Dr. Advincula brings 20 years of clinical expertise, innovation and leadership to the position. In addition to his departmental responsibilities, he also serves as Co-director of the AAGL accredited Fellowship in Minimally Invasive Surgery. Shortly after his arrival to New York City, Dr. Advincula also accepted the role of Medical Director of the Mary & Michael Jaharis Simulation Center for the Columbia University Vagelos College of Physicians & Surgeons. Despite his busy clinical and administrative schedule, Dr. Advincula has not only helped guide the growth of the simulation center across all health care disciplines but also continues to leverage his expertise in simulation-based medical education to help elevate the training of medical students, residents, fellows and physicians worldwide in advanced surgical techniques and optimized clinical care. Dr. Advincula serves on numerous editorial boards including OBG Management where he manages a widely viewed video education channel. Dr. Advincula has served on the board of the Society of Gynecologic Surgeons in addition to 18 months as President of the AAGL where he helped rebrand the strategic direction of a global minimally invasive gynecologic surgery society of nearly 8000 members.

AGENDA

7:30 - 7:35 am

WELCOME REMARKS

by Elizabeth A. Howell, MD, MPP

7:35 - 7:40 am

INTRODUCTION

by Anuja Dokras, MD, PhD

7:40 - 10:00 am

RESIDENT PRESENTATIONS

The Era of PCA Shortages: A Re-Examination of Postoperative Pain Control and DisparityPage 4

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Racial Disparities in Frozen Embryo Transfer Success.....Page 7

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Peripartum Cardiomyopathy and Risk of Subsequent Pregnancy.....Page 9

by Olga Corazón Irizarry, MD

Impact of Facility-Volume on Achieving a Textbook Oncologic Outcome Following Primary Debulking Surgery for Advanced Stage Epithelial Ovarian CarcinomaPage 10

by Dimitrios Nasioudis, MD

Mechanisms Underlying Nocturia in Women with Bladder Pain Syndrome/Interstitial CystitisPage 11

by Julie Suyama, MD, PhD

10:15 - 11:15 am

JOHN ROCK LECTURE

A Self-destruction and the Changing Landscape of Gynecologic Surgery: Where Do We Go From Here?

by Arnold P. Advincula, MD

11:15 - 12:30 pm

RESIDENT (PGY2) RESEARCH PROPOSALS

The Effect of Withholding Ketorolac on Development of Post-Operative Ileus in Abdominal and Pelvic Surgery Patients

by Margaret Rush, MD

Ectopic Pregnancy and Operating Room Efficiency

by Camille McCallister, MD, MPP

Disparities in Access to Clinical Trials in Gynecologic Oncology

by Erin McMinn, MD, MPH

Can We Better Educate Our Patient on GYN Procedures: A Study Comparing Video vs Written Form

by Lakeisha Mulugeta-Gordon, MD

Ovarian Conservation at time of Torsion Surgery

by Hannah Ryles, MD

Understanding the Health State Utility of Postpartum Anemia

by Rosa Speranza, MD

Home Blood Pressure Monitoring in Postpartum Low Risk Women

by Hunter Terry, MD

Implementation of the Immediate Postpartum Edinburgh Postpartum Depression Scale

by Kelly Zafman, MD, MS



THE ERA OF PCA SHORTAGES: A RE-EXAMINATION OF POSTOPERATIVE PAIN CONTROL AND DISPARITY

Authors **Nia Bhadra-Heintz, MD, MS** | Robert Gallop, PhD | Nathanael Koelper, MPH
Nawar Latif, MD, MPH, MSCE

Background Past research has shown that patient-controlled analgesia (PCA) pumps provide better pain control and more opioid utilization when compared to nurse controlled intravenous (IV) narcotics. This comparison, however, has not been reexamined in many years or with a diverse patient population. Due to a recent and lasting shortage, PCA has become a limited resource. Additionally, studies have demonstrated poorer postoperative pain control for people of color in medical settings, non-English speaking patients, and elderly patients.

Methods A retrospective cohort study was performed of postoperative University of Pennsylvania Health System patients. All open hysterectomies on the benign gynecology and gynecology oncology services during a six-month time period with PCA as the default pain control pathway (N= 169), and a six-month time period during the PCA shortage (N=168) were included.

Results For the PCA group (PCAG), there was no effect of PCA on pain scores at 12, 24, and 48 hours when controlling for type of incision (vertical or horizontal) or indication (benign or malignant). Younger patients were found to have higher pain scores at 12 hours ($p=0.001$) and patients of color were noted to have higher pain scores at 48 hours when compared to Caucasian patients ($p= 0.048$). There was no effect of language on pain scores. In the PCA shortage group (PCASG), patients with PCA had higher pain scores at 24 ($p=0.010$) and 48 hours ($p=0.030$) when controlling for type of incision or indication. Pain scores were higher for younger patients at 24 hours ($p= .050$). There was no effect of race or language on pain scores. Those with PCA used more opioids in both the PCAG ($p=0.0002$) and PCASG ($p=0.0006$). Younger patients also used more opioids in both the PCAG ($p=0.004$) and PCASG ($p=0.007$). There was no effect of race or language on amount of narcotic used in either group. Finally, in the PCASG, Caucasian patients were more likely to get PCA when compared to patients of color when controlling for pain scores, incision type, age, and indication for surgery ($p=0.012$).

Conclusion PCA was shown to have limited utility in postoperative pain control when used as a default for all patients. Importantly, people of color were less likely to receive PCA when compared to Caucasian patients during limited PCA availability. Future directions should undertake a more protocolized and less subjective escalation pathway in response to patient discomfort to reduce this disparity and provide less biased care.



THE ASSOCIATION OF PAYER STATUS WITH POSTPARTUM STERILIZATION FOLLOWING UNINTENDED PREGNANCY

Authors **Arina Chesnokova, MD, MPH** | Robert Gallop, PhD | Nathanael Koelper, MPH
Sarita Sonalkar, MD, MPH

Objectives Patients with public insurance in the United States (US) face disparate administrative barriers to obtaining permanent contraception, as compared with those with private insurance. We sought to evaluate the association of public insurance status with postpartum sterilization utilization following an unintended pregnancy in a nationally representative sample.

Methods We performed an analysis of the nationally representative 2013-2015 National Survey of Family Growth (NSFG). Respondents with either Medicaid or private insurance were included if they reported a prior unintended pregnancy that resulted in a live delivery. We excluded respondents who never had a live delivery, as well as those with Medicare, military, Indian Health Service, single service plan, or no insurance. Completion of tubal sterilization within 2 months of the unintended delivery was the primary outcome. Propensity scores were calculated assuming insurance status as the treatment. Age at time of index delivery, race/ethnicity, nativity, educational achievement, English proficiency, partner status, religious affiliation, mode of delivery, parity, BMI, and gestational age at delivery were included in the propensity score estimation model. To account for the complex survey design as well as to control for residual unobserved confounding, a multiple logistic regression was then built weighted by product of the survey and propensity score weights. Demographic and clinical variables were extracted from the NSFG to inform the model.

Results Our sample comprised 476 respondents representing 4,519,780 people in the US. In the final model described above, Medicaid insurance was found to be statistically significantly associated with lower odds of obtaining postpartum sterilization (OR 0.35 95% CI 0.15-0.79).

Conclusion Prior literature analyzing the impact of structural barriers posed by Medicaid insurance on obtaining desired sterilization is limited to single center studies. We show that Medicaid insurance may independently lead to lower rates of sterilization in a nationally representative sample of people with unwanted births.



OBSTETRICAL OUTCOMES OF LATE PRESENTING INTRAUTERINE PREGNANCIES

Authors

Olanrewaju Dawodu, MD | Jessica Wu, Robert Gallop PhD | Kurt T. Barnhart, MD, MSCE

Background

The discriminatory zone has been defined as the level of human chorionic gonadotropin when the normal landmarks of an intrauterine pregnancy are visible. This value varies across institutions from 1500-3000mIU/mL. However, many studies have documented viable pregnancies initially diagnosed as pregnancies of unknown location above this threshold. Little is known as to whether the late appearance of an intrauterine pregnancy on ultrasound is associated with adverse perinatal outcomes.

Objective

To investigate the relationship between delayed presentation of definitive intrauterine pregnancy landmarks on ultrasound with later adverse perinatal outcomes.

Methods

Data on pregnancy outcomes on women initially presenting as pregnancies of unknown location to the Emergency Department at the Hospital of the University of Pennsylvania between January 2007 to December 2019 were abstracted from electronic medical records. Patients were included if serum human chorionic gonadotropin was between 500-10,000mIU/mL and if eventually diagnosed with an intrauterine pregnancy. Cohorts were defined based on human chorionic gonadotropin levels <2000 or ≥ 2000 mIU/mL within 48 hours of pregnancy of unknown location diagnosis. The primary outcome of the study was the incidence of a good perinatal outcome, defined as a singleton live-born infant delivered at 37 weeks or later and weighing more than 2500 g. Secondary outcomes included spontaneous abortions, live birth, intrauterine fetal demise, birth weight (g), gestational age (days), hypertensive disorders of pregnancy (gestational hypertension and preeclampsia), postpartum hemorrhage, placental abruption, and gestational diabetes.

Results

A total of 487 patients met our inclusion criteria with 55.4% (n=270) presenting with human chorionic gonadotropin levels <2000 while 44.5% (n=217) had initial serum levels ≥ 2000 . The mean human chorionic gonadotropin in the control group was 1129.8, and 4295.6 for the exposed. There was no significant difference in the incidence of live birth, spontaneous abortion, or intrauterine fetal demise between the two groups. For our primary outcome (good perinatal outcome), we found no difference in incidence between both groups (RR=1.01, 95%CI (0.98-1.10)). The mean birth weight for the unexposed cohort was 3125 g, while that of the exposed was 3010 g. Adjusting for confounders including age and prior term births resulted in a significant difference in birth weight of 115grams with $p=0.044$. Sensitivity analysis on cohorts with human chorionic gonadotropin levels above 3000, 4000 and 5000 showed decreasing average birth weight 3,046.6 g (n=135, $p=0.115$), 3,009.9 g (n=93, $p=0.049$), and 2,990.9 g (n=53, $p=0.076$) respectively. Differences in mean gestational age at delivery between both groups did not reach statistical significance. There was a trend towards significance with incidence of iatrogenic preterm deliveries (RR=2.05, 95%CI (0.95-4.37)). Finally, we found no difference in other analyzed perinatal outcomes.

Conclusion

Absence of definitive of intrauterine pregnancy landmarks in patients with human chorionic gonadotropin levels above or below typical discriminatory zones is associated with similar good perinatal outcomes. Delayed presentation is associated with lower birth weights and could be a marker of placental dysfunction.



RACIAL DISPARITIES IN FROZEN EMBRYO TRANSFER SUCCESS

Authors

Quetrell Heyward, MD, MBA | Jessica R. Walter, MD | Snigdha Alur-Gupta MD MSCE
Arnav Lal, Dara S. Berger, PhD | Nathanael Koelper, MPH | Samantha F. Butts MD,
MSCE | Clarisa R. Gracia MD, MSCE

Background

Racial and ethnic disparities in pregnancy outcomes have been reported after fresh in vitro fertilization (IVF) cycles, but there are limited data on disparities after frozen embryo transfers (FETs). The objective of this study was to compare pregnancy and live birth rates after FETs among White, Black, and Asian women as well as explore the effect of patient, protocol, and cycle characteristics on success.

Methods

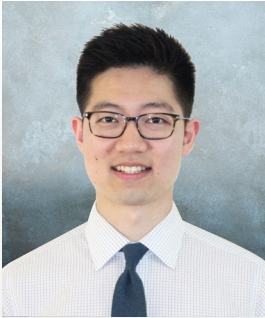
Women undergoing an autologous FET between January 2013 and March 2020 at Penn Fertility Care were included in the study. Co-maternity, surrogacy, donor oocyte/embryo cycles, and cycles involving preimplantation genetic testing (PGT) were excluded. Demographics and clinical characteristics including self-reported race and ethnicity were collected from the medical record. Continuous variables were compared using one-way ANOVA or Kruskal-Wallis test where appropriate while Pearson Chi-squared or Fisher's exact tests were used to compare categorical variables. Generalized estimating equation (GEE) models were used to examine the relationships between pregnancy, live birth, and race adjusting for BMI, age at the time of oocyte retrieval, and the number of embryos transferred.

Results

White, Black, and Asian women underwent 1181 (71.7%), 230 (14.0%), and 235 (14.3%) frozen embryo cycles, respectively. Black women were significantly less likely to achieve a positive hCG level (AOR 0.66, 95% CI 0.49-0.90), clinical pregnancy (AOR 0.71, 95% CI 0.53-0.97), and live birth (AOR 0.65, 95% CI 0.47-0.89) compared to White women after adjusting for BMI, age at the time of oocyte retrieval, and the number of embryos transferred. There were no differences in outcomes between Asian and White women after adjusting for the aforementioned confounders. Finally, when looking at endometrial preparation protocol, while there were no notable differences in clinical pregnancy by protocol, significant differences were seen amongst the three groups when looking at live birth rates following natural cycle FETs (52.36% vs. 25.81% vs. 44.19% for White, Black, and Asian women, respectively, $p=0.02$), a difference not appreciated with programmed FETs.

Conclusion

Black race is associated with significantly lower positive hCG, clinical pregnancy, and live birth rates following FET independent of the effects of BMI, age at the time of oocyte retrieval, and the number of embryos transferred when compared to White women. Additionally, significant differences in live birth rates among White, Black, and Asian women exist following natural cycle FET when comparing outcomes by endometrial preparation protocol.



A RESOLVED PLACENTA PREVIA IS STILL ASSOCIATED WITH POSTPARTUM HEMORRHAGE

Authors

Sun Woo Kim, MD | Rebecca Hamm, MD, MSCE | Nadav Schwartz, MD

Background

Placenta previa and low-lying placentas are associated with pregnancy-related hemorrhage. However, most cases resolve prior to delivery. Our objective was to determine whether resolution of a low-lying placenta or placenta previa are associated with postpartum hemorrhage (PPH).

Methods

This is a retrospective matched-control cohort study of women who underwent transvaginal sonography during fetal anatomic survey at the University of Pennsylvania from 1/2017-5/2019. Exposure was defined as low-lying placenta (≤ 1 cm from cervical os) or placenta previa at anatomic survey followed by resolution on third trimester ultrasound. For each exposure, we identified a control with placenta > 1 cm from internal os at anatomic survey performed on the same day. Exclusion criteria were: multiple gestation, malpresentation at delivery, bleeding disorder, anticoagulation therapy, placenta accreta, and persistent previa. The primary outcome was PPH at delivery, defined as estimated blood loss > 1000 mL.

Results

447 women were included (225/group). Of exposed, 85.0% had resolved low-lying placenta, while 15.0% had resolved previa; these were grouped for analysis. The rate of PPH was significantly higher with resolved previa versus controls (9.8% vs. 4.4%, $p=0.03$). Women with resolved previa were 2.5 times more likely to experience PPH than controls (aOR 2.58, 95%CI 1.17-5.69), even when controlling for parity, prior cesarean, and delivery mode. Women with resolved previa were also more likely to present to triage with bleeding (16.4% vs. 8.0%, $p=0.006$), receive antenatal corticosteroids, (9.3% vs. 3.1%, $p=0.006$), be induced for bleeding (5.8% vs 1.3%, $p= 0.02$), require unanticipated uterotonic (22.7% vs 15.1%, $p=0.04$) and require intravenous iron postpartum (7.6% vs. 3.1%, $p=0.04$).

Conclusion

Our data demonstrate that women with a resolved low-lying placenta and placenta previa remain at significantly increased risk of bleeding-related complications in pregnancy and during delivery when compared to those who never had a previa. Clinicians should consider this association when counseling and performing hemorrhage risk stratification.



PERIPARTUM CARDIOMYOPATHY AND RISK OF SUBSEQUENT PREGNANCY

Authors **Olga Corazón Irizarry, MD** | Camille McCallister, MD, MPP | Nathanael Koelper, MPH
Zoltan Arany, MD, PhD | Jennifer Lewey, MD, MPH | Lisa Levine, MD, MSCE

Background Peripartum cardiomyopathy (PPCM), a condition characterized by left ventricular heart failure, is associated with significant maternal morbidity and mortality. Small studies suggest a high risk of recurrence of PPCM in patients with a subsequent pregnancy (SSP), however data are limited when comparing demographic and clinical characteristics for women that elect to proceed with a SSP. This study aimed to use a mixed-methods approach to obtain quantitative information regarding demographic and clinical differences between patients with and without a SSP and to qualitatively describe the decision-making process for why patients do or do not elect to proceed with SSP.

Methods A prior study of 220 cases of PPCM was conducted within the University of Pennsylvania Health System (UPHS) and identified 72 patients with a SSP, representing 87 SSPs in the cohort. Demographic and clinical characteristics between patients with and without a SSP were compared. Patients with a SSP were invited to participate in a survey regarding clinical and obstetric outcomes with a SSP along with decisions surrounding SSPs.

Results Patients with a SSP were more likely to be younger (26.1 vs. 31.1 years; $p < 0.001$) at time of their PPCM diagnosis, nulliparous at diagnosis (60% vs. 42%, $p = 0.01$) and African American (75% vs. 45%; $p < 0.001$) compared to patients without a SSP. There was no difference in EF at time of diagnosis (31.3% vs. 27.5%; $p = 0.2$) or in ultimate recovery (54% vs. 60%, $p = 0.4$) between patients with and without a SSP, however, patients without a SSP were more likely to have a transplant (9% vs. 0%, $p = 0.008$) or LVAD (9% vs. 0%, $p = 0.008$) with no difference in death (7% vs. 4%, $p = 0.5$). There were 22 women who participated in the survey component (representing 44 SSPs) with no differences between responders and non-responders. Among survey participants, 41% ($n = 18$) of SSPs resulted in termination, 18% ($n = 8$) in first or second trimester losses, and 41% ($n = 18$) in live-born deliveries. All patients surveyed who elected a termination indicated a concern for recurrence or worsening heart failure to be a motivating factor.

Conclusion Within UPHS, patients without a SSP were more likely to have transplant or LVAD although this likely represents an inherent difference in those that elect to proceed with a SSP rather than a protective mechanism of SSP. Risks of PPCM recurrence serves as a strong motivating factor for patients electing not to proceed with a SSP.



IMPACT OF FACILITY-VOLUME ON ACHIEVING A TEXTBOOK ONCOLOGIC OUTCOME FOLLOWING PRIMARY DEBULKING SURGERY FOR ADVANCED STAGE EPITHELIAL OVARIAN CARCINOMA

Authors **Dimitrios Nasioudis, MD** | Emily M. Ko, MD, MSCR | Ashley F. Haggerty, MD, MSCE
Robert L. Giuntoli 2nd, MD | Sarah H. Kim, MD | Mark Morgan, MD
Nawar A. Latif, MD, MPH, MSCE

Background Composite outcomes have emerged as a more accurate marker of optimal oncologic care. We evaluated the impact of facility-volume on achieving a “textbook oncologic outcome” (TOO) among patients with advanced stage epithelial ovarian carcinoma (EOC) undergoing primary debulking surgery (PDS) followed by adjuvant chemotherapy.

Methods Patients diagnosed between 2004–2015 with stage III–IV EOC, bulky intra-abdominal disease who underwent PDS at the reporting facility followed by chemotherapy were identified in the National Cancer Database. Annual facility PDS volume was calculated and high-volume facilities were defined those performing at least 12 PDS per year. TOO was defined as achievement of complete gross resection (CGR), no 90-day mortality, no prolonged hospitalization (>10 days), no unplanned re-admission 30-days, and initiation of adjuvant chemotherapy within 42 days from surgery and evaluated among patients with available data for all variables. Median overall survival (OS) was compared with the log-rank test and a Cox model was constructed to control for confounders.

Results A total of 19875 patients were used to calculate annual PDS facility-volume. Final cohort included 6984 patients; 14.8% were managed at a high-volume center. A TOO was achieved for 1764 (25.3%) patients. Rate of CGR was 42.8%, while rate of prolonged hospitalization was 15.2%. Unplanned re-admission (8%) and death within 90-days (1.4%) were rare, while 28.6% of patients experienced a delay in chemotherapy administration. Patients managed at high-volume centers were more likely to achieve a TOO (28.1% vs 24.8%, $p=0.022$). After controlling for age, race, insurance, and comorbidities, PDS at a high-volume center was associated with a higher likelihood of achieving a TOO (OR: 1.17, 95% CI: 1.01, 1.36). Median OS of patients who did and did not achieve a TOO was 58.45 and 42.51 months respectively. After controlling for histology, stage, comorbidities, patient age, race, and type of insurance, TOO was associated with better survival (HR: 0.64, 95% CI: 0.59, 0.70).

Conclusion PDS at a high-volume center was associated with superior oncologic outcomes for patients with advanced-stage EOC. Centralization of care of these patients to centers of excellence should be considered.



MECHANISMS UNDERLYING NOCTURIA IN WOMEN WITH BLADDER PAIN SYNDROME/INTERSTITIAL CYSTITIS

Authors Julie Suyama, MD, PhD | Fan Nils Yang, PhD | Alex Soriano, MD
Hengyi Rao, PhD | Lily Arya, MD

Background Little is known about mechanisms underlying nocturia in women with bladder pain syndrome/interstitial cystitis (BPS/IC). The thalamus plays a primary role in the organization of the sleep-wake cycle. Our hypothesis was that nocturia is associated with activation of the thalamus in women with BPS/IC as compared to controls.

Methods Data from 27 subjects (14 women with BPS/IC and 13 age-matched controls) enrolled in a Multi-Disciplinary Approach to Chronic Pelvic Pain (MAPP) ancillary study through November 30, 2018 were analyzed. All subjects completed the Interstitial Cystitis Symptom and Problem Indices and PROMIS Sleep Disturbance Short Form to assess BPS/IC and sleep quality, respectively. All subjects also underwent arterial spin labeling functional MRI imaging to quantitatively measure cerebral blood flow (CBF) in the thalamus at baseline and after oral bladder fill in low urgency (score 1-3) and high urgency (score > 3) states. Nocturia was defined as ≥ 2 episodes of nocturnal voiding. CBF in the thalamus at baseline, low urgency, and high urgency states in women with BPS/IC and controls was compared using two-way mixed model ANOVA. The association between nocturia, CBF, sleep and bladder scores was also analyzed.

Results There was no significant difference in mean age (49 ± 13 vs. 45 ± 12 yrs, $p=0.4$) of BPS/IC group and controls. The BPS/IC group had greater number of nocturia episodes (median 3 vs. 1, $p < 0.01$) and greater sleep disturbance (60.7 ± 8.8 vs. 41.2 ± 9.9 , $p < 0.001$) than controls. CBF in bilateral thalamus increased as the level of urgency increased in the BPS/IC group but not in controls ($p < 0.01$, Figure 1). Baseline CBF in bilateral thalamus correlated with the number of episodes of nocturia in women with BPS/IC but not in controls (Figure 2). CBF at baseline and in the low urgency state was not significantly associated with sleep disturbance or bladder pain scores. However, CBF in the right thalamus in the high urgency state was significantly associated with sleep disturbance score ($r = -0.42$, $p = 0.03$).

Conclusion Nocturia and sleep disturbance in women with BPS/IC are likely modulated through the thalamus.

RESIDENT RESEARCH PUBLICATIONS

RESIDENT PUBLICATIONS 2020-21

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