Abstracts

Presenting Residents

Carla Chibwesha, MD
HPV Vaccine Knowledge And Demographic Characteristics Among a Cohort Of Vaccine Recipients Aged 19-26.
Preceptor: Lori Boardman, MD

OBJECTIVE: The introduction of a quadrivalent human papillomavirus (HPV) vaccine in 2006 marked the addition of an important preventive health tool in the arena of cancer prevention. This vaccine provides tremendous potential for reductions not only in cervical cancer but also lower genital tract condyloma and precancerous lesions. We evaluated patient demographics and HPV-related knowledge among a cohort of young women attending HPV vaccine clinics at a large, urban, tertiary care women’s hospital.

METHODS: Study investigators designed a self-administered questionnaire. All women attending a series of HPV vaccine clinics (aimed at 19-26 year olds) were eligible to participate. Prior to vaccination and survey completion, all women received written information on the vaccine. Our 34-item survey assessed participants’ demographic information, reasons for attending the clinic, and responses to 5 knowledge-based statements. Statistical analyses were performed using STATA (Version 8, College Station, TX).

RESULTS: Of the 104 women vaccinated during clinics held between May and October 2007, 85 (82%) agreed to participate. The median age of the cohort was 23 years. Sixty-one women (72%) described themselves as non-Hispanic white, 14 (17%) as Hispanic, 6 (7%) as Asian/Pacific Islander, and 4 (5%) as non-Hispanic black. The majority (91%) had completed at least some college and most women (68 or 80%) had undergone Pap smear screening within the past 2 years. Of the 85 women participants, 79 (93%) were sexually active. A history of an abnormal Pap smear was reported by 32 (38%) and genital warts by 8 (9%). In terms of HPV-related knowledge, only 19 women (22%) answered all 5 questions correctly. The answer most commonly incorrect related to the causal link between HPV and cervical cancer (52% answered this incorrectly). Women were more likely to have answered the HPV-knowledge related questions correctly if they had previously had an abnormal pap smear (OR \(= 3.88, 95\% \text{ CI (1.3 - 11.4)}.\)

CONCLUSION: Despite a high level of educational attainment and healthcare utilization, HPV-related knowledge is variable. Improved educational efforts remain integral to vaccine acceptability and cervical cancer prevention efforts.

Alexander Friedman, MD
Pyelonephritis in pregnancy as a prevention quality indicator for quality of prenatal care.
Alexander M. Friedman MD, MS; Maureen Phipps MD, MPH; Christina Raker MS; Brenna Anderson MD;
Preceptor: Brenna Anderson, MD

OBJECTIVE: The hospitalization rate for pyelonephritis during pregnancy has been proposed as a prevention quality indicator (PQI) for measuring good prenatal care. Our objective was to determine in a single hospital population whether pyelonephritis admissions resulted from failure to screen and treat urinary tract infections including asymptomatic bacteriuria (ASB), or were more associated with medical comorbidities and demographic characteristics.

METHODS: We performed a case-control study comparing pregnant women with pyelonephritis during pregnancy to those without. We reviewed each prenatal chart for appropriate screening and treatment for ASB and urinary tract infections and demographic
data and medical history. We reviewed each pyelonephritis admission to confirm diagnosis. The main outcome measure was whether screening failure was associated with pyelonephritis admissions. We planned to collect 220 cases and 220 controls to detect a 10% difference in treatment failure rates, with 80% power and alpha=0.05. We defined failures as not screening for ASB, not treating pathogenic bacterial growth on urine culture, and not culturing urine if a patient was treated for presumed infection.

**RESULTS:** We reviewed 204 cases and 220 controls, as there was a shortage of cases in our study interval. Patients with pyelonephritis were no less likely to be appropriately screened and treated throughout pregnancy compared to controls (82% vs. 79%, p= 0.3). Patients who developed pyelonephritis were significantly younger, more likely to be Latina, and have Medicaid insurance (p=<0.0001). Latina patients did not have significantly more medical comorbidities than other patients. Patients with a history of pyelonephritis were more likely to develop pyelonephritis during pregnancy (p=0.00009).

**CONCLUSION:** In our study population, pyelonephritis during pregnancy was not predicted by screening and treatment failure. Race, age, and insurance status were significantly associated with infection. Further research is warranted to investigate why infection rates tend to be higher in patients with these demographic variables.

Asha Jayakrishnan, MD

**Gender Associated Prematurity: The Singleton Gap Study.**
Asha Jayakrishnan, MD; Maureen Phipps, MD; Tanya L Dailey, MD; Christina A. Raker, MD; Edward K. Chien, MD

**Preceptor:** Edward K. Chien, MD

**OBJECTIVE:** To evaluate the contribution of male fetal gender to singleton preterm birth (PTB) rates in the United States.

**METHODS:** The 2002 National Center for Health Statistics Natality database was used to analyze descriptive statistics for known risk factors of PTB by fetal gender. Multivariable Cox proportional hazards regression was applied to estimate the hazard ratio by fetal gender for births between 24-36 completed weeks. The multivariable model was adjusted for known demographic, medical, and obstetric risk factors for PTB. Population attributable risk was calculated.

**RESULTS:** 3,847,377 singleton births were included in the overall analysis. PTBs between 24-36 completed weeks occurred in 10.8% with male and 9.7% with female gender. The association between PTB and male gender was independent of other risk factors for PTB (HR 1.125, 95% CI 1.117-1.133) and did not vary by gestational age. The population attributable risk for male gender was 6.02%.

**CONCLUSION:** In the US, male fetuses are at higher risk for PTB compared with female fetuses at the same gestational age. The etiology of this difference is unclear. Population based studies are helpful in identifying and tracking these differences.

Michelle Magallanez, MD

**Changes in organized collagen in relation to cervical resistance in a pregnant rat.**

**Preceptor:** Edward Chien, MD

**OBJECTIVE:** Cervical resistance declines with advancing gestation. It is assumed that this change is due mainly to collagen based on declining collagen concentrations and increasing soluble collagen content. Soluble collagen is not believed to contribute to weight bearing function. The objective of this study is to describe the changes in organized collagen during gestation in the rat cervix and relate it to changes in cervical resistance. Our hypothesis is that
organized collagen declines with pregnancy corresponding to the decline in cervical resistance.

**METHODS:** The cervical specimens were harvested from timed pregnant rats. Four animals were used for each gestational day: non-pregnant, day 12, 16, 18, 20, 21, and 22. The tissues were embedded in OCT compound and frozen using methanol and dry ice, then stored at -80°C. Tissues were sectioned at 8 μm and stained with picosirius red. Imaging was performed on an Olympus BL2 Light Microscope using polarizing filters and a Nikon digital camera and stored in Tif format. Images were obtained with similar exposure and light settings during a single session. Metavue analysis software was used to determine organized content by measuring total birefringent collagen. Statistical analysis was performed with Sigma Stat Software. The data was analyzed using ANOVA and multiple comparisons tests.

**RESULTS:** The area occupied by birefringent cervical collagen decreases with advancing gestation, correlating to a decline in organized collagen. This decline was statistically significant (One-way ANOVA on Ranks, p<0.001). Significant differences between groups were seen (Pairwise Multiple Comparisons: Tukey Test): non-pregnant versus day 20; non-pregnant versus day 22; day 12 versus day 20, and day 12 versus day 22.

**CONCLUSION:** As gestation progresses, the resistance in cervical tissue decreases. Organized collagen content decreases with advancing gestational age as manifested by a decrease in birefringent collagen. The decline in organized collagen content more closely reflects the decline in cervical resistance then measures of total collagen or collagen solubility. Organized collagen may be a better predictor of cervical competence during pregnancy then other measures of collagen.

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**Brenda Martin, MD**

**Role of BMI as a Risk Factor for Synchronous Endometrial and Ovarian Cancers.**

Brenda Martin, MD; Laurent Brard, MD, PhD; Chris Raker, ScD

**Preceptor:** Laurent Brard, MD, PhD

**OBJECTIVE:** Synchronous ovarian cancer following surgery for endometrial cancer occurs in 0-29% of patients. Defining risk factors for synchronous endometrial and ovarian cancer (SEOC) would improve preoperative counseling in patients with endometrial cancer considering ovarian conservation. Our aim was to establish if a body mass index (BMI) of <25 is associated with an increased risk of SEOC.

**METHODS:** A retrospective case-control study of 783 endometrial cancers presented at WIH Multidisciplinary Tumor Board between 7/99-12/04 was performed. Patients with grade 1-2 endometrioid endometrial cancer with documented age, parity, BMI, tobacco, medical and family history were included in the analysis. Institutional rate of SEOC and association with age ≤ 50 was assessed. To determine if BMI is an independent risk factor for SEOC, cases were matched 2:1 with controls. Analysis of matched data was performed using the Mantel-Haenszel test.

**RESULTS:** 561 patients were identified with grade 1-2 endometrioid endometrial cancer. 24 (4.3%) cases of SEOC were identified. Women ≤50 years old were more likely to have SEOC than women >50 [9.3 vs 2.9%, p=.002, OR 3.5 (1.5-8.0)]. Characteristics between groups were similar, except that cases were more likely to be nulliparous [60 vs 28% p=.009, OR 3.9 (1.46-10.1)]. Matched study population included 19 SEOC cases and 38 controls. BMI <25 was significantly associated with 4 times the odds of SEOC compared to a BMI ≥25 [37 vs 11%, p=.02, OR 4.00 (1.06 – 15.04)].

**CONCLUSIONS:** BMI of <25 is associated with increased odds of SEOC. Data is suggestive that an age ≤ 50 and nulliparity may be risk factors as well. Determining a patient’s risk of SEOC at time of endometrial cancer diagnosis may improve preoperative counseling.
Deirdre Masterton, MD
Misoprostol for non-viable first trimester pregnancies – Can patients accurately determine spontaneous miscarriage completion?
Preceptor: Kristen Matteson, MD, MPH
OBJECTIVE: To determine if patients who receive misoprostol for nonviable first trimester intrauterine pregnancy can accurately report whether or not they have completed their miscarriage.
METHODS: This is a prospective cohort study of women presenting for medical care at the Women and Infants Hospital (WIH) Triage Unit between March 2007 and March 2008 who chose misoprostol for management of their nonviable first trimester intrauterine pregnancy. To be eligible, patients had to be able to read either English or Spanish and be able to give informed consent. Participants received misoprostol per WIH protocol and completed a survey asking about demographic characteristics, symptoms and whether or not they thought their miscarriage was complete, prior to a follow-up ultrasound. Completed miscarriage was determined using specific predetermined ultrasound parameters. Negative predictive value (NPV), positive predictive value (PPV), and accuracy were calculated and 95% confidence intervals (CI) were generated using the exact binomial method. We estimated that 60 participants were necessary to detect accuracy of 80% between patient self-report and ultrasound diagnosis of miscarriage completion.
RESULTS: Nineteen participants are enrolled in this study and recruitment is ongoing. Seventy-five percent of eligible patients participated. Data for the main analyses, the computation of NPV, PPV, and agreement are available for 18 participants. Of this population of women choosing misoprostol, 62% had a previous miscarriage. Fourteen participants (78%) thought they had completed their miscarriage. Seventy-nine percent of participants (n=15) had confirmed completion of their miscarriage by ultrasound. We found 89% (95% CI 65%-99%) accuracy between patient self-report of miscarriage and ultrasound diagnosis of miscarriage. The PPV of a participant thinking she had completed her miscarriage was 93% (95% CI 66%-100%) and the NPV of a participant thinking she had not completed her miscarriage was 75% (95% CI 19%-99%).
CONCLUSIONS: These preliminary data suggests that patients may be able to determine, with acceptable accuracy, whether or not they have completed their miscarriage after administration of misoprostol. If such data are confirmed using adequate sample size, convenient and less costly telephone triage protocols for women receiving misoprostol for pregnancy failure could be supported in our population.

Cara Mathews, MD
Accuracy of Preoperative and Intraoperative Pathological Findings in Low Grade Endometrial Cancer.
C. Mathews, MD; C Raker, MD; M. Steinhoff, MD; C. Bandera, MD; D. Dizon, MD.

OBJECTIVE: The risk of metastases in endometrial cancer is related to final pathology results, which are unavailable to the surgeon at the time when lymphadenectomy is performed. This study will analyze the correlation between intraoperative and final pathology results in early, low grade endometrial cancer.
METHODS: A retrospective chart review (n=186) was performed of women who underwent surgery for endometrial cancer between 1992 and 2002. Eligible patients were diagnosed preoperatively with Grade 1 endometrial cancer and ≤50% myometrial invasion on gross intraoperative pathology consult (clinical stage IA1 or IB1.) The clinical stage was then
compared with the surgical stage as determined by final pathology. A subgroup of patients with tumor size ≤2 cm was further analyzed to investigate whether there was better correlation on final pathology among those with smaller tumor size.

**RESULTS:** There were 186 women identified, of whom 18.3% were upgraded to Grade 2 or Grade 3 on final pathology and 2.7% were found to have high risk histology other than endometrioid. Among those with Stage IA cancer at the time of surgery, only 68.6% were Stage IA on final pathology. Among those diagnosed as Stage IB at the time of surgery, 41.1% were Stage IB on final pathology. Tumors ≤2 cm were upstaged in 24% of patients, while tumors >2 cm were upstaged in 36% of patients, with a RR of 0.67 (CI 0.3320-1.3387).

**CONCLUSIONS:** There was no statistically significant improvement in correlation between clinical stage and final pathology in cancers with tumor size ≤2 cm. The percentage of women upstaged on final pathology is too high to warrant using tumor size ≤2 cm as a predictor in final pathology results. Patients with low risk endometrial cancer should continue to be completely surgically staged with pelvic and paraaortic lymphadenectomy.

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**Melissa Sherman, MD**

**Improving Influenza Vaccination Rates in Pregnancy.**

**Preceptor:** Maureen G. Phipps, MD, MPH

**OBJECTIVE:** To evaluate the change in rates of influenza vaccination using a targeted provider-focused reminder during October–November 2005 compared with October–November 2003.

**METHODS:** Retrospective cohort study comparing vaccination rates among pregnant Women’s Primary Care Center patients between October–November 2003 (no reminder) and October–November 2005 (reminder placed on patient chart). Charts of all patients presenting for prenatal care during those months were reviewed for vaccination order. Overall vaccination rates were calculated and compared by year, provider, age, race, education, primary language, insurance type, and presence or absence of medical risk factors.

**RESULTS:** 1367 records were reviewed, 504 from 2003, 863 from 2005. Medical risk factors were identified in 396 patients (29%). Overall vaccination rate increased from 15% in 2003 to 52% in 2005 with a reminder present. This represents a risk difference of 37% (95% CI 32.45–41.56). Vaccination rates for patients with medical risk factors increased from 18% to 47%. All provider groups demonstrated significant increases in the rates of vaccination with a reminder. There was no significant difference in vaccination based on age, race, primary language, or insurance.

**CONCLUSIONS:** Provider-focused reminders increased the rate of vaccination by 37%. To achieve the ACOG goal of 100% vaccination pregnancy clinics should consider additional measures including patient and provider education, dedicated vaccination clinics, and standing orders.
Presenting Fellows

Sarosh Rana, MD
Sequential Changes in Antiangiogenic Factors in Early Pregnancy and Risk of Developing Preeclampsia.
Preceptor: Ananth Karumanchi, MD

OBJECTIVE: Concentrations of two anti-angiogenic proteins, soluble fms-like tyrosine kinase 1 (sFlt1) and soluble endoglin (sEng), increase in maternal blood with the approach of clinical preeclampsia. While alterations in circulating anti-angiogenic factors are thought to play an important role as mediators of the signs and symptoms of preeclampsia, they are not thought to reflect placentation abnormalities that occur between 11-18 weeks of gestation since early gestational changes of these factors have not been previously studied in detail. In vitro cell culture studies, however, suggest anti-angiogenic factors may play a role in regulating placental cytotrophoblast differentiation and migration. Therefore, early trimester changes in sFlt1 and sEng may identify women destined to develop preeclampsia.

METHODS: We performed a nested case-control study of 39 women who developed preeclampsia and 147 contemporaneous controls with normotensive pregnancies each with serum collected in the first (11-13 weeks of gestation) and second (17-20 weeks) trimesters and analyzed for sFlt1 and sEng. Multivariable analyses were performed using logistic regression.

RESULTS: Levels of sFlt1 and sEng at 11-13 weeks were similar in women who subsequently developed preeclampsia compared with controls (sFlt1: 3.5 ± 0.3 ng/ml vs. 3.0 ± 0.1, P=0.14; sEng 6.9 ± 0.3 ng/ml vs. 6.6 ± 0.2, P=0.37, respectively), but at 17-20 weeks concentrations of both anti-angiogenic factors were higher in the women destined to develop preeclampsia (sFlt1: 4.1 ± 0.5 ng/ml vs. 3.1 ± 0.1, P<0.05; sEng, 6.4 ± 0.4 ng/ml vs. 5.2 ± 0.1, P<0.01). Women who later developed preterm preeclampsia (<37 weeks) demonstrated even greater sequential changes than did comparable controls (the difference [delta {d}] between second and first trimester levels: dsFlt1, 0.63 ± 0.91 ng/ml in preterm PE vs. 0.05 ± 0.15 in controls; dsEng, 0.73 ± 0.77 ng/ml vs. -1.32 ±0.18, P < 0.01). Modifications of these parameters by multiplying sFlt1 and sEng (dproduct) and categorizing dproduct into tertiles provided significant prognostic information in univariate and multivariate analyses.

CONCLUSION: The rise in sFlt1 in normal pregnancy from first to second trimester may be increased in women who later develop preeclampsia, particularly preterm preeclampsia, and the fall in sEng may be diminished or even reversed. Sequential changes in anti angiogenic factors during early pregnancy may be useful for predicting preterm preeclampsia.

Abida Sattar, MD
Selected Cases Of Isolated Radial Scar On Core Needle Biopsy May Be Observed Without Excision. A Radiologic-Pathologic Analysis.
Preceptor: Jennifer Gass, MD

OBJECTIVE: Radial scars are often excised because of the risk of an associated malignancy. The reported incidence of malignancy in biopsies with an isolated Radial Scar (i.e. Radial scar without associated atypia or malignancy) is 4%, suggesting that excision is being over-utilized. We sought to determine if radiologic-pathologic correlation could be used to identify those patients with Isolated Radial Scar (iRS) on core needle biopsy (CNB) who could be managed without definitive excision.

METHODS: Cases with iRS on CNB between January 2000 and June 2006 were identified, and categorized into those who had excision versus those who did not. Radiology and pathology reports were reviewed. The two cohorts were compared for biopsy and
mammography findings to identify factors that lead to definitive surgical excision, as well as to identify findings associated with the final diagnosis of breast cancer at excision.

**RESULTS:** We identified 23 patients with iRS on CNB. On Radiologic-Pathologic correlation, the only factor associated with a cancer diagnosis at excision was a BIRADS 5 mammogram (p=0.03). (Table) The pathologic findings of usual ductal hyperplasia, florid ductal hyperplasia, and papillomas on CNB were not predictive of subsequent cancer diagnosis at excision. Using log regression, the only factor to predict malignancy on excision among women with an iRS on CNB was a BIRADS 5 mammogram (OR 30, 95%CI 1.4-638.0).

**CONCLUSIONS:** In our series, excision of iRS appears to be driven mainly by mammographic findings. Our results suggest that iRS on CNB in the absence of atypia or malignancy does not necessarily warrant excision. It may be reasonable to follow without excision, carefully selected cases of iRS on CNB, especially if their mammogram is devoid of worrisome findings. Such a hypothesis warrants further testing in a prospective clinical trial.

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**Renee Ward, MD**

**The Impact of Multichannel Urodynamics upon Treatment Recommendations for Female Urinary Incontinence.**

Renée M. Ward, MD, B. Star Hampton, MD, Jeffrey D. Blume, PhD, Vivian W. Sung, MD, MPH, Charles R. Rardin, MD and Deborah L. Myers, MD

**OBJECTIVE:** To evaluate whether multichannel urodynamic testing changes a physician’s treatment recommendations when managing women with urinary incontinence.

**METHOD:** In this prospective reader study, four fellowship-trained Urogynecologists reviewed 39 abstracted cases of urinary incontinence on two occasions: first without, and subsequently with urodynamic data. Treatment recommendations were made for each case after each review. The probability of urodynamic data modifying treatment recommendations was estimated for each reader, and for the population of readers using a random effects logistic regression to account for reader variability.

**RESULTS:** The overall probability that urodynamic data would change treatment was 26.9% (95% CI, 18.6%, 37.2%) for medical treatments and 45.5% (95% CI, 37.8%, 53.4%) for surgical treatments. Reader-to-reader differences accounted for 3% and <1% of the total variance, respectively.

**CONCLUSION:** Multichannel urodynamic evaluations are significantly associated with changes in medical and surgical treatment recommendations in a referral population.