Infectious Diseases in Obstetrics and Gynecology 7:253–270 (1999)


# *INFECTIOUS DISEASES SOCIETY FOR OBSTETRICS AND GYNECOLOGY*

## *Annual Scientific Meeting and Symposium*

## *August 4-7, 1999*

## *Toronto, Ontario, Canada*

# SCIENTIFIC PROGRAM

## Thursday, August 5, 1999

### General Sessions

7:00 am - noon — Registration

8:15 - 8:30 am — Welcome - Stanley A. Gall, MD, IDSOG President
Opening Remarks - James A. McGregor, MD, CM
Scientific Program Chair

8:30 - 9:30 am — **Scientific Session I Moderator: Heather Watts, MD**

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| 8:30 am | Carolyn Gardella, MD<br>*Symptomatic Herpes Simplex Virus (HSV) at the Time of Labor and Cesarean Section*<br>***Best Abstract*** |
| 8:45 am | Jane Hitti, MD<br>*Amniotic Fluid Infection and Interleukin-6: Association with Adverse Neonatal Outcome Among Preterm Infants* |
| 9:00 am | Amy P. Murtha, MD<br>*Apoptosis in the Chorion Laeve of Patients with Preterm Premature Rupture of Membranes and Histologic Chorioamnionitis* |
| 9:15 am | Robert S. McDuffie, Jr., MD<br>*A Randomized Controlled Trial of Interleukin-1 Receptor Antagonist (IL-1 ra) in a Rabbit Model of Infection-Induced Pregnancy Loss* |

9:30 - 9:45 am — **IDSOG/3M Fellowship Award Research Presentation**
Steven D. Spandorfer, MD
Cornell University Medical Center
*Cell-Mediated Immune Responses and Local Cervical Immunity to Heat Shock Proteins in IVF Patients: Correlations with Outcome*

9:45 - 10:45 am — **Scientific Poster Session**
*Interaction and discussion between poster presenters and attendees*

10:45 - 11:30 am — **Scientific Session II Moderator: Cheryl Walker, MD**

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| 10:45 am | Marijane A. Krohn, Ph.D<br>*Demographic and Behavioral Characteristics of Women With $H_2O_2$ Negative or Without Lactobacillus Vaginal Colonization* |
| 11:00 am | Rebecca Yee, MD<br>*The Association of Helicobacter Pylori Seropositivity to Hyperemesis Gravidarum* |
| 11:15 am | Lin Tao, Ph.D<br>*Viruses Infecting Vaginal Lactobacilli* |

11:30 am - 12:30 pm — **Presidential Guest Lecturer**
*Fetal Inflammatory Response Syndrome*
Roberto Romero, MD
Chief, Perinatology Research Branch, NICHD
Hutzel Hospital
Dept of Ob/Gyn
Detroit, MI

**Friday, August 6, 1999**

**General Sessions**

7:00 am - noon — Registration

7:30 - 8:00 am — IDSOG Business Meeting

8:00 - 8:30 am — **CDC-P Lecture**
Kathleen Irwin, M.D, MPH
*Chlamydia Infection: Reaching the Year 2000 Goals*

8:30 - 9:00 am — **Special IDSOG Lecture**
Burton Sol, M.D.
*The Oxford-Vermont Initiative in Cooperative Clinical Research*

9:00 – 10:00 am — **Scientific Session III Moderator: Mara Dinsmoor, MD**

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| 9:00 am | L. Chesney Thompson, MD<br>*A Randomized Controlled Trial of Metronidazole Vaginal Cream in the Treatment of Pap Smears Showing Atypical Squamous Cells of Undetermined Significance (ASCUS)* |
| 9:15 am | Dorothy L. Patton, Ph.D<br>*The Vaginal Microbiology of the Pig-Tailed Macaque is Similar to that of the Human* |
| 9:30 am | Youyin Choy, MD<br>*Epidemiology of Hepatitis C in an Urban Obstetrical Population: Relationship to Sexually Transmitted Diseases and Substance Abuse* |
| 9:45 am | Linda O. Eckert, MD<br>*Associations of Serovar Type, Inclusion Forming Units (IFU), Race, and Age in Initial and Repeat C Trachomatis (Ct) Infections in Women* |

10:00 - 10:30 am — **Break**

10:30 - 11:30 am — **Scientific Session IV Moderator: Steven Witkin, Ph.D**

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| 10:30 am | Deborah Money, BSc, MD<br>*Lifetime Cervical Cytology in a Cohort of HIV Infected Women: Analysis of Pre-HIV and Post-HIV Results* |
| 10:45 am | Dorothy L. Patton, Ph.D<br>*Influence of a Single Episode of Intercourse on the Vaginal Flora and Epithelium With and Without Condom Use* |
| 11:00 am | Rodney K. Edwards, MD<br>*Expanding the Spectrum of Antibiotic Coverage for Expectantly Managed Preterm PROM: Associations with Maternal and Neonatal Infections* |
| 11:15 am | Harold C. Wiesenfeld, MD, CM<br>*Endometrial Microbiology in Women with Bacterial Vaginosis*<br>***Best Young Investigator Abstract*** |

11:30 am - 12:15 pm — **Special IDSOG Lecture**
Dr. George Seiber
*Vaccines for the New Millenium*

6:00 - 9:00 pm — **Annual Society Banquet; Awards Presentations**
*Lifetime Achievement Award*: Richard Schwarz, MD
*Best Abstract Award:* Carolyn Gardella, MD
*Best Young Investigator Award:* Harold C. Wiesenfeld, MD, CM
*Best Poster Award*: TBA

**Saturday, August 7, 1999**

**General Sessions**

7:00 am - noon Registration

8:00 – 8:45 am Reports of IDSOG Task Teams

8:45 – 10:00 am **Scientific Session V Moderator: Steve Witkin, Ph.D**

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| 8:45 am | Lauren E. Steinhandler, MD<br>*Combination of Leukorrhea and Bacterial Vaginosis as a Predictor of Cervical C. Trachomatis or N. Gonorrhea* |
| 9:00 am | Jeffrey F. Peipert, MD, MPH<br>*Evaluation of Clinical Criteria for the Diagnosis of En dometritis* |
| 9:15 am | James A. McGregor, MD<br>*Analysis and Answers: The Medical & Legal Case for Treating Partners as Patients* |
| 9:30 am | Sharon L. Hillier, Ph.D<br>*Chorioamnion Infection and Pregnancy Outcome* |
| 9:45 am | Lisa Lepine, MD<br>*The Association of Bacterial Vaginosis with Postpartum Endometritis After Vaginal and Cesarean Delivery* |

10:00 - 10:30 am **Break**

10:30 - 11:45 am **Scientific Session VI Moderator: Roberta Ness, MD, MPH**

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| 10:30 am | Kim A. Boggess, MD<br>*Maternal Serum Nitric Oxide Metabolites are Lower in Preterm Compared to Term Labor* |
| 10:45 am | Zane A. Brown, MD<br>*The International Acyclovir Pregnancy Registry: Interim Results* |
| 11:00 am | Mark S. Funk, MD<br>*Randomized Comparison of Metronidazole Vaginal Gel Verses No Therapy for ASCUS Pap Smears* |
| 11:15 am | Jeffrey F. Peipert, MD, MPH<br>*Microflora Changes With the Use of a Vaginal Microbicide* |
| 11:30 am | *Mara J. Dinsmoor, MD*<br>*Lack of Correlation Between $CD_4$ Count and Genitourinary Tract Infections (GUI) in Pregnant Women Infected With HIV* |

11:45 am - noon **Late Breaker:**
Jack Sobel, MD
*Controlled Trial of Diflucen for Complicated Vaginal Candidiosis*

Noon **Closing Remarks**
Stanley A. Gall, MD

*Annual Meeting Adjournment*

## SCIENTIFIC POSTER SESSION

**Thursday, August 5, 1999**
9:45 –10:45 am

Poster # 1 *Possible Involvement of Ureaplasma Urealyticum in the Development of Post-Partum Endometritis*
Walter Chaim, MD

Poster # 2 *Use of Protease Inhibitors (PI) in Pregnancy Does Not Increase the Risk of Elevated Glucola Results (ABN GLU)*
Scott T. Forrest, MD

Poster # 3 *Microbial Etiology of Pelvic Inflammatory Disease (PID) in Nairobi, Kenya: Preliminary Results*
Craig Cohen, MD

Poster # 4 *Screening for Group B Streptococcus – Are We Doing it Right?*
Helen McDonald, PhD

Poster # 5 *Antibiotic Resistance in Group B Strep Isolates from Nonpregnant Women*
Tony S. Wen, MD

Poster # 6 *The Obstetrician/Gynecologist (Ob/Gyn) Role in Vaccine Preventable Diseases (VPD) and Immunization*
Bernard Gonik, MD

Poster # 7 *Early Neonatal Candidal Colonization is Associated with Length of Ruptured Membranes and Route of Delivery*
Kim A. Boggess, MD

Poster # 8 *Group B Strep Resistance to Antibiotics and Peripartum Outcomes*
Jeanna M. Piper, MD

## ORAL ABSTRACTS

**Thursday, August 5, 1999**
**General Sessions**
**Scientific Session I**
**8:30 - 9:30 am**

Infectious Diseases in Obstetrics and Gynecology 7:253–270 (1999)


## SYMPTOMATIC HERPES SIMPLEX VIRUS (HSV) AT THE TIME OF LABOR AND CESAREAN SECTION

C Gardella, MD, ZA Brown, MD, R Ashley, PhD, S Selke, MS, J Zeh, PhD, S Berry, RN,
L Corey, MD. University of Washington, Seattle, WA

**Objectives:** There have been few quantitative virological studies of symptomatic HSV reactivation at the time of labor and cesarean section.

**Study Design:** Between 1989 and 1994, all women admitted in labor had genital HSV cultures performed. Genital lesions thought to be due to HSV were also cultured. HSV serostatus was determined by Western blot. Women were excluded from the study if delivery occurred >48 hours after obtaining the cultures. Quantitative HSV DNA by PCR was compared in women with symptomatic lesions due to HSV and those with subclinical shedding. Clinical characteristics of suspected HSV lesions at the time of delivery were obtained by chart review.

**Results:** During the study period, 53 women were found to be asymptomatically shedding at the time of labor and 94 women were delivered by cesarean section for genital lesions thought to be HSV. The two groups were demographically similar and approximately 81% of each group were HSV-2 seropositive. Genital HSV cultures were performed in 79/94 (84%) of women undergoing C/S for lesions thought to be genital HSV; 21/79 (27%) were positive. HSV PCR was performed on 38/94 (40%) of the lesion swabs; 20/32 (52%) were positive. Evaluation of lesion description and patient symptoms failed to identify a descriptor that was more likely associated with a positive lesion culture. The median viral load for women with asymptomatic shedding delivered vaginally and for the women with lesions delivered by cesarean section was $10^4$ copy units/50 ul of specimen.

**Conclusions:** Clinical presentation is poor at identifying culture positive lesions. Among women delivered by cesarean section for lesions thought to be genital HSV, 27% were culture positive and 52% were PCR positive. There was no significant difference in the viral load at the time of labor among women with asymptomatic shedding and women with symptomatic genital HSV. Our current strategy for performing cesarean sections on all women with symptomatic genital lesions at the time of labor should be reexamined.

## AMNIOTIC FLUID INFECTION AND INTERLEUKIN-6: ASSOCIATION WITH ADVERSE NEONATAL OUTCOME AMONG PRETERM INFANTS

J Hitti, P Tarczy-Hornoch, J Murphy, SL Hillier, MA Krohn, DA Eschenbach.

**Objective:** We sought to determine whether amniotic fluid (AF) infection and elevated AF interleukin-6 (IL-6) were associated with adverse neonatal outcome among preterm infants.

**Study design:** We conducted a prospective study of 134 infants at ≤ 34 weeks' gestation, born to women admitted in preterm labor with intact membranes. AF was collected by transabdominal amniocentesis for culture and IL-6 determination. We compared outcomes for 19 infants with a positive AF culture, 24 infants with a negative AF culture and AF IL-6 > 2000 pg/ml, and 91 infants with a negative culture and AF IL-6 ≤ 2000 pg/ml. The adjusted odds ratios (aOR) were calculated for the associations between a positive AF culture and elevated AF IL-6 and the following outcomes: grade 3-4 intraventricular hemorrhage (IVH), necrotizing enterocolitis (NEC), patent ductus arteriosus (PDA) and a positive blood or CSF culture at ≤ 7 days. Logistic regression was used to adjust for birthweight.

**Results:**

| Outcome | (+) AF Culture (N=19) | (-) AF Culture, IL-6> 2000 pg/ml (N=24) | (-) AF Culture, IL-6≤ 2000 pg/ml (N=91) | Significance |
|---|---|---|---|---|
| Birthweight | 1048 | 1324 | 1851 | .001 |
| Gestational Age | 26 | 29.5 | 32 | .001 |
| Grade 3-4 IVH | 3 (16%) | 3 (12%) | 2 ( 2%) | .03 |
| NEC | 5 (26%) | 4 (17%) | 5 ( 6%) | .01 |
| PDA | 10 (53%) | 7 (29%) | 10 (11%) | .001 |
| Culture(+) Sepsis | 8 (42%) | 3 (12%) | 3 ( 3%) | .001 |

A positive AF culture was associated with neonatal sepsis (aOR 2.6, 95%CI 1.4-5.2) and NEC (aOR 2.1, 95%CI 1.1-3.9). An elevated AF IL-6 was associated with grade 3-4 IVH (aOR 2.4, 95%CI 1.0-5.9)

**Conclusions:** AF infection and elevated AF IL-6 are associated with poor neonatal outcome, suggesting a systemic inflammatory response among exposed preterm infants.

## APOPTOSIS IN THE CHORION LAEVE OF PATIENTS WITH PRETERM PREMATURE RUPTURE OF MEMBRANES AND HISTOLOGIC CHORIOAMNIONITIS

AP Murtha, JA Kalich, WNP Herbert, Duke University Medical Center, Durham, NC

**Objective:** Apoptosis has been reported to be accelerated in the chorion laeve of term patients with histologic chorioamnionitis. We sought to determine if the proportion of apoptosis in the chorion laeve was increased in PPROM patients with histologic chorioamnionitis when compared to those without histologic chorioamnionitis.

**Study Design:** There were 47 PPROM patients admitted during the study period. Fetal membrane samples in 30 of these PPROM patients were selected for analysis. Formalin fixed, paraffin embedded, fetal membrane samples with and without histologic chorioamnionitis were examined for evidence of apoptosis using Apoptag Plus kit (Oncor, Gaithersburg, MD). Samples were stained using the TUNEL method and the extent of apoptosis was quantified by counting the number of apoptotic nuclei in the chorion laeve relative to normal nuclei in 7 random high-powered fields. All histologic samples were reviewed by a single pathologist. Data were analyzed by Mann Whitney U test with significance defined as $P<.05$. In the remaining 17 fetal membrane samples there was insufficient chorion laeve for quantification of apoptosis. Absence of the chorion laeve was confirmed using specific cytokeratin staining.

**Results:** There were no significant differences in maternal age, race, insurance status, cesarean delivery rate, or gestational age at delivery between the two groups. Chorion laeve of fetal membranes from PPROM patients with histologic chorioamnionitis had significantly more apoptotic nuclei than those without chorioamnionitis.

| | Chorioamnionitis | No Chorioamnionitis | |
|---|---|---|---|
| Number of samples | 20 | 10 | |
| Total nuclei (mean +/– SD) | 555 (+/–132) | 556 (+/–106) | NS |
| Total apoptotic nuclei (mean +/– SD) | 19.1 (+/–7.2) | 10.8 (+/–5.7) | P=.005 |
| Percent positive nuclei | 3.3% | 2.0% | P=.003 |

Of the 17 subjects excluded for absence of the chorion laeve, 16 (94%) had at least moderate chorioamnionitis.

**Conclusions:** The results of this study suggest that apoptosis is accelerated in the chorion laeve of PPROM subjects with histologic chorioamnionitis. The absence of chorion laeve in 36% of subjects is supportive of the hypothesis that inflammation accelerates cell death and potential destruction of the chorion laeve.

## A RANDOMIZED CONTROLLED TRIAL OF INTERLEUKIN-1 RECEPTOR ANTAGONIST (IL-1 ra) IN A RABBIT MODEL OF INFECTION-INDUCED PREGNANCY LOSS

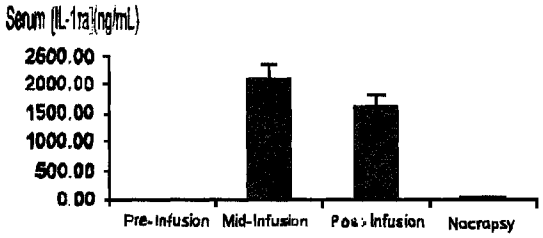
R. McDuffie, M.D., J. Davies, M.D., K. Leslie, M.D., S. Woodcock, BS, S. Lee BA, R. Gibbs, M.D., Kaiser Permanente and University of Colorado Health Sciences Center, Denver, CO

**Objectives:** To evaluate the effect of IL-1 ra on clinical and microbiological outcomes after intracervical inoculation of the pregnant rabbit with Escherichia coli.

**Study Design:** The cervices of timed pregnant New Zealand white rabbits were inoculated endoscopically with $10^{6-7}$ c.f.u. of E.coli on day 21 or 22 of a 31 day gestation. Animals were assigned randomly (2:1 ratio) in a blinded manner to treatment with a 5 hr. intravenous infusion of human IL-1 ra (10 mg/kg, kindly provided by Amgen, Inc.) or sterile diluent (placebo) beginning 1-2 hrs. after inoculation. Blood was drawn for assay of IL-1 ra concentration (ELISA performed by Amgen, Inc.) before, during, and after the infusion, and at necropsy (16 hrs. after inoculation). At necropsy, rectal temperature was taken, and cultures were taken from the uterus, amniotic fluid (AF), peritoneal fluid, and blood. Amniotic fluid was collected for competitive ELISA for prostaglandin E (PGE) and for bioassay for tumor necrosis factor-α (TNF-α). Fever was defined as a temperature at necropsy ≥ 104 degrees F. Sample size calculations were based on anticipated rates of fever of 10% in the IL-1 ra group and 60% in the placebo group. Categorical and continuous variables were analyzed in an intent to treat manner. A p value < 0.05 was considered significant.

**Results:** 26 doses were assigned to IL-1 ra group and 13 to the placebo group. One rabbit died during the IL-1 ra infusion and was excluded from the analysis of temperature only. Outcomes are listed below.

| Outcome | IL-1 ra (n=26) | Placebo (n=13) | p value |
|---|---|---|---|
| Fever | 17 (68%) | 8 (62%) | NS |
| + culture of uterus or AF | 21 (81%) | 9 (69%) | NS |
| Any + culture AF | 21 (81%) | 10 (77%) | NS |
| PGE (ng/ml) | 2.98 (0.74 SEM) | 3.55 (0.98 SEM) | NS |
| AF TNF-α (pg/ml) | 259.9 (56.8 SEM) | 296.7 (82 SEM) | NS |




Concentrations of IL-1 ra treated in animals were highest at mid-infusion and declined rapidly after the infusion finished. None of the placebo group had detectable concentrations of IL-1 ra.

**Conclusions:** Intravenous infusion of IL-1 ra begun shortly after cervical inoculation with E.coli did not improve clinical or microbiologic outcomes in a rabbit model of infection-induced pregnancy loss despite concentrations considered therapeutic. Concentrations of IL-1 ra were highest during mid-infusion and lowest at necropsy after the infusion ended. Concentrations of AF PGE and TNF-α were similar in both groups.

Sponsored by a grant from the March of Dimes (#6-FY97-0297).

**Thursday, August 5, 1999**
**General Sessions**
**Scientific Session II**
**10:45 - 11:30 am**

## DEMOGRAPHIC AND BEHAVIORAL CHARACTERISTICS OF WOMEN WITH $H_2O_2$ NEGATIVE OR WITHOUT *LACTOBACILLUS* VAGINAL COLONIZATION

MA Krohn, Ph.D., SL Hillier, Ph.D. University of Pittsburgh, Pittsburgh, PA

**Objectives:** The purpose of the study was to describe the demographic and behavioral characteristics of women who were colonized with $H_2O_2$ negative or who were not colonized with *Lactobacillus* spp.

**Study Design:** The design was a cross-sectional cohort of 458 asymptomatic healthy women enrolled from 1997 to 1999 at three clinical sites associated with the University of Pittsburgh. Women participated in a personal questionnaire and provided self-collected vaginal swabs. The specimens were cultured for *Lactobacillus* spp. (LB), group B *Streptococcus*, *Escherichia coli*, and yeast. *Lactobacillus* spp. were classified as being $H_2O_2$ positive or negative using a qualitative assay on tetramethylbenzidine agar. Women $H_2O_2$ negative or without LB were each compared to $H_2O_2$ positive women using chi-square statistics and logistic regression.

**Results:** Among the 458 women, 132 (29%) had no LB isolated, 61(13%) had only $H_2O_2$ negative LB, and 265 (58%) had $H_2O_2$ positive LB. Women who were without LB were more likely to be of nonwhite race (aOR=3.0; 95%CI 1.9–4.9); have less than high-school education (aOR=3.3; 95%CI 1.4-7.9); and were more likely to smoke (aOR=2.2; 95% CI 1.2–4.2). Women who had only $H_2O_2$ negative LB were also more likely to have less than a high school education. After adjustment for other covariates, douching, barrier contraception, and number of sex partners were not associated with having $H_2O_2$ negative LB or lacking LB.

**Conclusions:** These findings suggest that demographic and behavioral characteristics influence women's colonization status with *Lactobacillus* spp. Ethnicity, smoking and education may be markers for other behaviors which negatively impact colonization by LB, but have not yet been determined.

**THE ASSOCIATION OF HELICOBACTER PYLORI SEROPOSITIVITY TO HYPEREMESIS GRAVIDARUM**

Rebecca Yee, M.D., R. Phillip Heine, M.D.

Infection with *Helicobacter pylori* (*H. pylori*) is associated with multiple gastrointestinal conditions, including dyspepsia and chronic gastritis. A recent study by Frigo et. al (Ob/Gyn, 1998; 91:615-7) showed an increase in *H. pylori* seropositivity in patients with hyperemesis gravidarum, a gastrointestinal condition unique to pregnancy.
**Objective:** To compare the prevalence of *H. pylori* in patients with hyperemesis gravidarum to a control group of asymptomatic pregnant patients in the first trimester.
**Study Design:** Serum was collected from patients presenting to the Magee Womens Hospital Emergency Department with a diagnosis of hyperemesis gravidarum. The diagnosis was based on a history of nausea and vomiting, ketonuria and orthostasis. The control group consisted of patients seeking prenatal care in the first trimester with no history of gastrointestinal disease. H. pylori IgG, IgA and cagA gene IgG were detected by ELISA. The prevalence of antibody was compared using chi-square.
**Results:** We collected samples from forty-two patients with hyperemesis and forty-seven control patients. In the hyperemesis group, the prevalence of antibodies was 19.0% (8/42), 19.0% (8/42) and 14.2% (6/42) for IgG, IgA, and cagA IgG, respectively. In the control group, 25.5% (12/47), 23.4% (11/47), 21.3% (10/47) were positive for IgG, IgA and cagA IgG. There were no significant differences between the control and the hyperemesis group.
**Conclusion:** In our population, hyperemesis gravidarum is not associated with H. pylori infection.

**VIRUSES INFECTING VAGINAL LACTOBACILLI**

L Tao, Ph.D., AO Kilic, Ph.D., SI Pavlova, Ph.D., SM Mou, MD; S Alpay, Ph.D.; and JE Clarridge, Ph.D.; University of Illinois at Chicago; Karadeniz Technical University, Trabzon, Turkey; University of Rochester, NY; and Baylor University, Houston, TX.

**Objectives:** (1) To determine whether viruses could infect vaginal lactobacilli; (2) to establish an *in vitro* BV model with the virus; (3) to identify viral transmission among women; and (4) to identify sources and types of the viruses.
**Study Design:** Vaginal samples were collected from 207 normal or BV-affected women in Kansas City and Trabzon, Turkey. Lactobacilli were isolated using Rogosa SL agar. All 210 *Lactobacillus* strains were analyzed for viruses using mitomycin C induction and cross-infection. Thirty four lactobacilli from 20 yogurts, 9 from human feces, 8 from male urine, and sewage samples from 3 water treatment plants were analyzed for viruses infecting vaginal lactobacilli. Forty oral lactobacilli were also tested for viruses. Viruses were characterized by electron microscopy, host range and DNA fingerprinting, whereas *Lactobacillus* strains were analyzed by protein profiles and AP-PCR.
**Results:** From vaginal lactobacilli 67 viruses were isolated, which infected lactobacilli isolated from the same or different women. To the co-culture of lactobacilli and G. *vaginalis*, adding viruses caused a dominance shift, simulating the initiation of BV. DNA fingerprints showed that an identical virus infected 3 women, implying viral transmission, and that one virus infected two different lactobacilli of the same woman, implying *in vivo* viral infection. Among 67 vaginal viruses, 4 morphotypes were observed. The viral genomes ranged from 32 to 47 kb, and were double-stranded and linear. The yogurt lactobacilli released 11 viruses; 7 infected vaginal lactobacilli with a narrow host range. Of 6 viruses isolated from sewage (1 temperate and 5 lytic), 5 infected vaginal lactobacilli with a broad host range. From 9 fecal strains, only 1 virus was isolated; it infected 2/3 of vaginal strains tested. Two viruses were isolated from 8 male urinary lactobacilli; both infected 1/3 of vaginal strains tested. Among 40 oral lactobacilli, however, none released a virus infecting vaginal lactobacilli.
**Conclusion:** Viruses could infect vaginal lactobacilli, create a shift in microbial dominance, and transmit among different women. In addition to the vagina, other sources may also carry viruses infecting vaginal lactobacilli. The finding of viruses in male urine implied that men can also be a source of such viruses.

**Friday, August 6, 1999**
**General Sessions**
**Scientific Session III**
**9:00 – 10:00 am**

**A RANDOMIZED CONTROLLED TRIAL OF METRONIDAZOLE VAGINAL CREAM IN THE TREATMENT OF PAP SMEARS SHOWING ATYPICAL SQUAMOUS CELLS OF UNDETERMINED SIGNIFICANCE (ASCUS)**

L.C. Thompson MD, P. OConnor RNCNP, R. Gibbs MD, University Of Colorado Health Sciences Center, Denver Colorado.

**Objectives:** In women with pap smears showing ASCUS, we compared Metronidazole vs. placebo to assess resolution of the pap smear.
**Study Design:** Patients with recent pap smears showing ASCUS were identified and offered enrollment in the study. The presence of bacterial vaginosis (BV) was assessed based on four clinical criteria. At enrollment patients were randomized to 0.75% Metronidazole Vaginal Gel vs. the buffered gel vehicle. The patients were instructed to apply five grams intravaginally qhs for five days and return for a follow-up pap smear in three to five weeks after therapy. We used resolution of the ASCUS pap smear vs. persistence or progression to dysplasia as the main endpoint. Power analysis predicted the need for forty patients in each arm and we projected an attrition rate of twenty percent. Chi-square analysis was used to determine statistical significance. In a planned subanalysis we stratified the population for the presence of bacterial vaginosis to determine if this subset of the population has a different response profile.
**Results:** We enrolled 101 patients. Forty-nine patients received Metrogel while fifty-two patients received placebo and ten patients were lost in each group. Outcomes are shown below:

Percent With Normal Pap Smears On Follow-up Evaluation.

| Group | Metrogel | Placebo | P value |
|---|---|---|---|
| Total pts (N=81) | 26/39 (67%) | 25/42 (59%) | N.S. |
| Subgroup with BV. (N=38) | 14/20 (70%) | 12/18 (67%) | N.S. |

**Conclusions:** Treatment of patients with recent ASCUS pap smears using topical Metronidazole did not demonstrate a significant increase in the rate of resolution in subsequent pap smears in the overall group nor in a subgroup with BV.

(Drug and placebo provided by Curatek and 3M pharmaceuticals.)

**THE VAGINAL MICROBIOLOGY OF THE PIG-TAILED MACAQUE IS SIMILAR TO THAT OF THE HUMAN**

Dorothy L. Patton, Ph.D., Yvonne T. Cosgrove Sweeney, Lorna K. Rabe, Sharon L. Hillier, Ph.D., Department of Obstetrics and Gyne-

cology, University of Washington, and Magee-Womens Hospital, University of Pittsburgh.

**Objectives:** A nonhuman primate model, utilizing the *Macaca nemestrina*, (pig-tailed macaque) monkey, has been used to study chlamydial cervicitis and to evaluate topical microbicide effects on vaginal flora. The vaginal flora of these monkeys has been described as being similar to that of women, in that both species are colonized with many of the same organisms. In this study, we will further strengthen the animal model, by using quantitative microbiology to assess the populations of organisms present in the vagina of pig-tailed macaques, and comparing them to human vaginal flora.
**Study Design:** We collected baseline vaginal swabs from 60 sexually mature, female *Macaca nemestrina* monkeys. Each swab was placed in a Port-a-cul with transport medium immediately after being collected, and sent by overnight mail for quantitative assessment.
**Results:** The geometric mean was calculated for reporting populations of each organism. Percent prevalence and populations of vaginal flora detected in pig-tailed macaque monkeys were compared to those previously published for humans[1]. The results are presented in the following table:

| Organism(s): | Macaca nemestrina n=60 [% (GMT)] | Human n=85 [% (GMT)] |
|---|---|---|
| Total Lactobacillus species | 80 ($10^{4.8}$) | 96 ($10^{7.0}$) |
| $H_2O_2$-positive Lactobacilli | 68 ($10^{4.8}$) | 61 ($10^{7.2}$) |
| Gardnerella vaginalis | 22 ($10^{6.7}$) | 46 ($10^{6.0}$) |
| Diphtheroids | 92 ($10^{5.6}$) | 72 ($10^{3.8}$) |
| Coagulase-negative staphylococci | 38 ($10^{4.5}$) | 89 ($10^{4.0}$) |
| Viridans streptococci | 82 ($10^{6.1}$) | 55 ($10^{4.7}$) |
| Enterococcus species | 38 ($10^{5.5}$) | 39 ($10^{5.1}$) |
| Group B streptococci | 2 ($10^{5.0}$) | 15 ($10^{4.2}$) |
| Anaerobic gram-positive cocci | 88 ($10^{5.8}$) | 92 ($10^{4.2}$) |
| Anaerobic gram-negative rods | 98 ($10^{5.9}$) | 91 ($10^{4.3}$) |

**Conclusions:** The concentrations of lactobacilli in the pig-tailed macaque are 2-3 logs lower than seen in humans, while viridans streptococci are both more frequent and present at higher concentrations in the macaque. The use of the nonhuman primate model for the evaluation of topical microbicide safety and efficacy is further strengthened by these results. This study suggests that this model has the ability to assess changes in vaginal flora caused by candidate topical microbicides.
*1. Hillier, et al. Clin Infect Dis 1993;16(Suppl 4):S273-81.*
*Supported by CONRAD CSA-98-215, and grant P01-AI-39061 from the Public Health Services and grant RR00166 from the WaRPRC.*

## EPIDEMIOLOGY OF HEPATITIS C IN AN URBAN OBSTETRICAL POPULATION: RELATIONSHIP TO SEXUALLY TRANSMITTED DISEASES AND SUBSTANCE ABUSE

Lisa Gittens MD, Youyin Choy MD, Joseph Apuzzio MD, Peter McGovern MD

**Objective:** Hepatitis C virus (HCV) is a common blood borne infection in the US (1.8 % of the population). Use of parenteral drugs is the most commonly reported risk factor. Sexual promiscuity and nasal cocaine use are reported risk factors in men. Sexually transmitted diseases (STDs) and substance abuse are common among our population. We undertook this study to test the hypothesis that our patients have a higher incidence of HCV than the general population, and to identify risk factors for HCV.
**Study Design:** All pregnant patients in our prenatal clinic (1997-1999) who tested positive for one or more STDs were asked to return for anti-HCV antibody testing. All patients who returned for HCV antibody tests were studied. Positive antibody testing was confirmed with RIBA or PCR. The incidence of HCV and relationships between Hepatitis C and individual STDs (Hepatitis B, HIV, GC, Chlamydia, Syphilis, Trichomonas, Herpes, Condyloma), drug abuse and other historical factors were evaluated.
**Results:** 162 patients with STDs were tested for HCV. HCV infection was confirmed in 6.8% of patients (95% CI = 3.4-11.8%). This value is significantly higher than the incidence In the general population (p=.0004). HIV (p=.005) and Hepatitis B (p=.0013) infections were both predictive of HCV. HCV was also predicted by use of: any illicit drug (p=.0001), IV drugs (p=.0001), or intranasal drugs (p=.0001). HCV-positive patients were also significantly older than HCV-negative patients ( p= .0001)
**Conclusions:** Urban obstetrical patients are at high risk for Hepatitis C infection. Patients with HIV, Hepatitis B or drug use should clearly be screened. Further study is needed to understand the epidemiology of HCV in this population.

## ASSOCIATIONS OF SEROVAR TYPE, INCLUSION FORMING UNITS (IFU), RACE, AND AGE IN INITIAL AND REPEAT *C TRACHOMATIS* (Ct) INFECTIONS IN WOMEN

LO Eckert, MD, SE Hawes, MS, RJ Suchland, BS, WE Stamm, MD. Department of Obstetrics and Gynecology, University of Washington School of Medicine, Seattle, WA.

**Objectives:** To determine biologic and demographic factors associated with initial and subsequent cervical infections (infxns) with Ct.
**Study Design:** Culture positive women in all Seattle/King County STD clinics between 1988-1996 with age, race, serovar type and IFU were used for initial study (n=7096). For repeat infxns, (subsequent Ct positive culture ≥ 60 days from initial) a single clinic based case-control study was done. Multiple logistic regression analysis was performed on both groups to determine significant factors.
**Results:** In the 7096 positive cultures from all clinics, median IFU count was higher in Caucasian and African American women than Asian and Native American Women (475, 400, 310, 300 respectively, p< .001). Median IFU count decreased with increasing age groups (625 in 16-19 yo, 400 in 20-24 yo, 280 in 25-29 yo, 185 in > 30 yo, p < .001 for trend).
Of the 1618 women in a single STD clinic with initial infection, 228 (14.1%) had repeat infections.

**Multivariate Regression of Risk Factors for Repeat Infections**

| Variable | OR (95% CI) | P-value |
|---|---|---|
| Initial Infection log IFU count | 1.01 (0.88-1.15) | 0.9 |
| **Race** | | |
| Caucasian | 1.0 | Ref |
| African-American | 2.0 (1.4-2.8) | <0.001 |
| Asian | 2.4 (1.3-4.3) | 0.004 |
| Hispanic | 4.0 (2.1-7.3) | <0.001 |
| Native American | 2.3 (1.1-4.3) | 0.1 |
| **Age** | | |
| <16 | 5.2 (2.5-11.5) | <0.001 |
| 16-19 | 2.4 (1.3-4.9) | 0.009 |
| 20-24 | 1.5 (0.8-3.1) | 0.3 |
| 25-29 | 0.8 (0.3-1.9) | 0.6 |
| 30+ | 1.0 | Ref |

An initial infection of intermediate serovar class was of borderline risk for reinfection (OR 0.7 95% CI 0.4-1.0, p=. 07).

**Conclusion:** Initial IFU count is related to race and age. Young age is also an independent risk factor for reinfection, but not initial IFU count. Racial differences in reinfection risk were seen here. This may be a result of true biological or behavioral differences, or simply reflect population preferences for health care seeking from this single clinic.

**Friday, August 6, 1999**
**General Sessions**
**Scientific Session IV**
**10:30 - 11:30 am**

## LIFETIME CERVICAL CYTOLOGY IN A COHORT OF HIV INFECTED WOMEN: ANALYSIS OF PRE-HIV AND POST-HIV RESULTS

Money, D.M., Sidhu, R., Birch, P., Miller, D., Burdge, D.

**Objectives:** To evaluate incidence of cervical dyskaryosis and progression of cervical pre-cancerous changes in women before and after HIV infection.
**Study Design:** The lifetime cervical cytology data for all women attending a tertiary care HIV clinic (Oak Tree Clinic) from May 1994 to December 1998 was collected. Utilising the British Columbia cancer agency database, 1,945 pap smear results were obtained on the 201 women in the cohort. Timing of HIV infection was assessed and carefully estimated based on seroconversion information and detailed history.
**Results:** The women in this cohort had; mean age of 30.6 years ( 16.7-54.5 yrs), mean duration of infection of 5.5 years (<1 y – 17 yrs), ethnicity was 69.7% caucasian, 21.9% first nations, 58% injection drug users, 61.2% hepatitis C positive, 35.3% had opportunistic infections, mean CD4 was 422.6 (1-1940), and 61.2% received antiretroviral therapy.

Overall pap results: N = 201women (1,945 paps)

| | Pre HIV infect. | Post HIV infect. |
|---|---|---|
| Median worst | Benign sq. atypia | Benign sq. atypia |
| Median best | Normal | Normal |

Of the 92 women who had at least 2 pap smear results both pre and post HIV infection, 38 (41%) had their worst result pre-HIV infection, 34(37%) had their worst result after HIV-infection and 20 (22%) had no difference in their results over time.

Severe abnormalities: N=42/92

| | Pre HIV | Post HIV | Total |
|---|---|---|---|
| HGSIL * | 23 | 11 | 34 |
| CIS | 6 | 2 | 8 |

* P< 0.05

In the cohort of 92 women, there was no association between cytology results and ethnic origin, mode of acquisition, gravidity, age, date of infection, or antiretroviral use.
**Conclusions:** In our cohort, it was notable that cervical cytology results were not adversely influenced by the acquisition of HIV infection alone. We speculate that cervical cytology in this population is more likely influenced by other known factors such as number of sexual partners, HPV carriage, access to regular pap smear screening and attendance for care for significant cervical cytologic abnormalities. A lowering of pap smear abnormalities in the post HIV infection time period is likely related to access to treatment of abnormalities.

## INFLUENCE OF A SINGLE EPISODE OF INTERCOURSE ON THE VAGINAL FLORA AND EPITHELIUM WITH AND WITHOUT CONDOM USE

DL Patton, PhD, KJ Agnew, BS, A Meier, MS, J Aura, ARNP, T Hooton, MD, A Stapleton, MD, WE Stamm, MD, DA Eschenbach, MD., Dept. of OB/GYN and Medicine, University of Washington, Seattle, WA

**Objective:** Repeat examinations of vaginal flora, discharge and mucosa following a single episode of vaginal intercourse with and without condom use.
**Study Design:** Women subjects were enrolled at day 19-24 of the menstrual cycle and randomized into condom versus no condom study groups (visit 1). Lubricated condoms without spermicide were provided. A month later, subjects were asked to abstain from intercourse for 2 days prior to visit 2, have vaginal intercourse (IC) after visit 2, return 8-12 hours after intercourse for visit 3, and again abstain from intercourse through visit 5. Visits 4 and 5 occurred 3-4 and 6-8 days after intercourse. At visit 1, an examination; STD, vaginal and urine cultures; and a vaginal biopsy were obtained. At visits 2-5, an examination and vaginal and urine cultures were obtained. A vaginal biopsy also was obtained at visit 3. Data were assessed using logistic regression for correlated data.
**Results:** A single episode of intercourse with (n=22) or without condom use (n=23) did not adversely affect the vaginal epithelium by gross, colposcopic or histologic examination. The number of PMNs in vaginal or cervical smears was unchanged. Vaginal flora remained unchanged in both groups, with one notable exception. The recovery of *E. coli* and/or a facultative Gram negative rod from the vagina (together designated as GNRs) was related to the episode of intercourse. The odds of having GNRs increased significantly at visit 3 compared to the other visits as shown in the Table.

| Group | Visit No: | 1 | 2 | IC | 3 | 4 | 5 | OR | P-value |
|---|---|---|---|---|---|---|---|---|---|
| GNRs w/Condom | | 3/22 | 1/20 | | 5/20 | 3/20 | 2/18 | 2.4 | .025 |
| GNRs w/o Condom | | 6/23 | 6/23 | | 9/22 | 2/22 | 3/18 | 2.3 | <.002 |

An increased incidence of GNRs at visit 3 also was identified in urine cultures.
**Conclusions:** A single episode of intercourse appears to cause an increased incidence of facultative Gram negative rods in the vagina and urine and may help explain the relationship between vaginal intercourse and urinary tract infection.
Supported by R01 HD33203 from the National Institutes of Health.

## EXPANDING THE SPECTRUM OF ANTIBIOTIC COVERAGE FOR EXPECTANTLY MANAGED PRETERM PROM: ASSOCIATIONS WITH MATERNAL AND NEONATAL INFECTIONS.

Rodney K. Edwards, M.D., Gregory J. Locksmith, M.D., and Patrick Duff, M.D. – University of Florida, Gainesville, Florida and University of Texas Medical Branch, Galveston, Texas

**Objective:** To compare maternal infection rates, neonatal sepsis rates, and bacterial resistance of three different antibiotic protocols for women with preterm premature rupture of membranes (PPROM).
**Study Design:** From 7 July 1987 to 28 February 1998, women with PPROM who did not require immediate delivery were managed under one of three antibiotic protocols. From 1/1/88 to 2/28/91 we did not provide antibiotics. From 3/1/91 to 9/30/93 we provided intravenous ampicillin for 48 hours, followed by oral amoxicillin, until cervical and vaginal culture results became available. From 10/1/93 to 2/28/98 we treated patients with intravenous ticarcillin-clavulanic acid

for 48 hours, followed by oral amoxicillin-clavulanic acid, until culture results became available. We compared chorioamnionitis, endometritis, and neonatal sepsis rates between the different time periods. We also compared antimicrobial resistance patterns of the organisms causing neonatal sepsis. Comparisons were made using chi square analysis, Fisher exact test, and the log-likelihood ratio test. The Bonferroni correction was used for multiple comparisons.

**Results:** We managed 465 patients with PPROM with the first protocol, 510 patients during the ampicillin protocol, and 720 patients under the ticarcillin-clavulanic acid protocol. Chorioamnionitis rates were 13.5%, 12.7%, and 15.6% during the three different time periods and did not differ (P = .34). The incidence of endometritis during the ticarcillin-clavulanic acid protocol (5.3%) was significantly reduced compared to the first time period (15.1%, p < .00001) and to the ampicillin protocol (11.6%, p = .0003). Neonatal sepsis rates were 2.2% under the first protocol, 0.8% under the ampicillin protocol, and 1.1% under the ticarcillin-clavulanic acid protocol (p = 0.14). Comparisons of gram-negative and ampicillin resistant organisms causing neonatal sepsis are depicted below.

| | Antepartum Antibiotic Therapy | | | |
|---|---|---|---|---|
| | No Abx | Ampicillin | Ticarcillin-C.A. | P |
| Gram-negative | 0/10 | 2/3 | 2/6 | .02 |
| Ampicillin-resistance | 3/10 | 3/3 | 3/6 | .04 |

**Conclusions:** Antepartum antibiotic therapy for expectantly managed PPROM was associated with an increase in the proportion of gram-negative and ampicillin-resistant organisms causing neonatal sepsis. Extending the spectrum of antibiotic coverage was not associated with improvement in neonatal infection but was associated with a reduction in maternal endometritis.

## ENDOMETRIAL MICROBIOLOGY IN WOMEN WITH BACTERIAL VAGINOSIS

Harold C. Wiesenfeld, MD,CM, Sharon Hillier, PhD, Marijane Krohn, PhD, R. Phillip Heine, MD, and Richard Sweet, MD. University of Pittsburgh School of Medicine, Magee-Womens Research Institute, Pittsburgh, PA

**Objectives:** Bacterial vaginosis-associated microorganisms are commonly recovered from the upper genital tract of women with acute PID. This study evaluates the microbiology of the endometrium in women with bacterial vaginosis.

**Study Design:** We enrolled 122 women with BV and 40 women without BV. Women with signs or symptoms of acute PID were excluded. BV was determined by Gram stain of vaginal fluids. Endometrial sampling was performed and the tissue was evaluated for aerobic and anaerobic bacteria, as well as genital mycoplasmas.

**Results:** Recovery of any BV-associated microorganisms from the endometrium was more common in women with BV than in women without BV (71% vs 35%, p<0.01). The following organisms were more frequently isolated from the endometrium of women with BV than without BV: *G. vaginalis* (63% vs 33%, p<0.01), anaerobic pigmented gram negative rods (20% vs 3%, p<0.05), anaerobic nonpigmented gram negative rods (38% vs 15%, p<0.05), *Peptostrepococcus spp* (29% vs 10%, p<0.05), anaerobic *Streptococcus* (22% vs 10%, p<0.05). *Mycoplasma hominis* and *Ureaplasma urealyticum* were not more commonly isolated from the endometrium among women with BV.

**Conclusions:** BV-associated microorganisms are commonly isolated from the endometrium of women with bacterial vaginosis. Studies to determine the role of asymptomatic upper genital tract colonization in adverse reproductive outcomes are underway.

**Saturday, August 7, 1999**
**General Sessions**
**Scientific Session V**
8:45 – 10:00 am

## COMBINATION OF LEUKORRHEA AND BACTERIAL VAGINOSIS AS A PREDICTOR OF CERVICAL *C. TRACHOMATIS* OR *N. GONORRHEA*

L. Steinhandler, MD, J.F. Peipert, MD, MPH, A. Montagno, RN, C. Cruickshank, BA. Department of Obstetrics and Gynecology, Women & Infants Hospital, Providence, RI.

**Objective:** To determine whether the combination of leukorrhea and bacterial vaginosis (BV) noted on microscopic saline vaginal preparation can predict a group at high-risk for infection with *Neisseria gonorrhoeae* or *Chlamydia trachomatis*.

**Study Design:** We performed a prospective study of 601 women evaluated in an urgent care unit at Women & Infants Hospital. Our *a priori* hypothesis was that the combination of leukorrhea and BV noted on saline wet preparation can identify a group of patients with a high prevalence of infection with *N. gonorrhoeae* or *C. trachomatis*. Residents prospectively collected wet prep data on women presenting to the unit. Demographic characteristics were noted based on a review of the patient's medical record. We used the Amsel's criteria to document the presence of BV, and ligase chain reaction testing of the endocervix was performed for *N. gonorrhoeae* or *C. trachomatis*. We calculated $^2$ for linear trend, odds ratios and 95% confidence intervals using SAS and EpiInfo 6.0.

**Results:** Data from the 601 women is available at the time of this analysis. We grouped patients into three groups: (1) no evidence of BV/no evidence of leukorrhea; (2) evidence of BV or leukorrhea, but not both; and (3) both leukorrhea and BV. The rate of positive testing for *N. gonorrhoeae* or *C. trachomatis* was 9% (34/343) in group 1, 15% (29/166) in group 2, and 35% (10/29) in group 3 ($^2$ for linear trend=15.3, P < 0.0001). The odds ratio for a positive test in women with the combination of BV and leukorrhea relative to women without both findings is 4.4 (95% confidence interval 1.8, 10.2).

**Conclusions:** Patients seen in this urgent care facility and found to have both BV and leukorrhea had a high prevalence of cervical infection with *N. gonorrhoeae* or *C. trachomatis*. Providers should consider empiric treatment of these patients to cover for these organisms especially when there is difficulty in contacting the patient to provide results and treatment.

## EVALUATION OF CLINICAL CRITERIA FOR THE DIAGNOSIS OF ENDOMETRITIS

J.F. Peipert, MD, MPH, D. Bass, MS, R. Ness, MD, MPH, D. Soper, MD, H.C. Wiesenfeld, MD, R.L. Holley, MD, H. Randall, MD, S. Hendrix, DO, S. Sondheimer. MD, Women & Infants, Providence, RI; Magee-Womens Hospital/U. Pittsburgh, Pittsburgh, PA; MUSC, Charleston, SC; UAB, Birmingham, AL; Emory U., Atlanta, GA; Wayne State, Detroit, MI; U. Penn, Pennsylvania, Philadelphia, PA.

**Objective:** To determine the diagnostic test characteristics of commonly used clinical criteria for the diagnosis of endometritis in women evaluated for suspected pelvic inflammatory (PID).

**Methods:** We used the baseline enrollment data from the PID and Clinical Health (PEACH) Study to evaluate the sensitivity and specificity of clinical criteria for the diagnosis of PID. Subjects were enrolled at 13 clinical centers as participants in a randomized clinical trial of outpatient versus inpatient (intravenous) therapy. Women presenting with pelvic tenderness and signs of lower genital tract infection (leukorrhea, mucopus, or a positive test for *Neisseria gonorrhoeae* or *Chlamydia trachomatis)* and without signs of tubo-ovarian abscesses were recruited. Patients were considered positive if their endometrial biopsy showed more than one plasma cell per high power field.

**Results:** Data from the 561 enrolled is available at the time of this analysis. The diagnostic test characteristics of selected clinical criteria are listed below:

| | Sensitivity | Specificity |
|---|---|---|
| Pelvic tenderness and abnl discharge | 97% | 8% |
| CDC minimal criteria | 85% | 19% |
| Vaginal pH > 4.7 | 84% | 27% |
| Temp > 101° F | 8% | 96% |
| Positive test for GC or CT | 35% | 87% |
| Elevated serum WBC (> 10,000) | 39% | 76% |

**Conclusions:** In order to maximize diagnostic sensitivity, the minimal criteria of any pelvic tenderness and abnormal vaginal or cervical discharge would provide high sensitivity. Other supportive findings such as elevated temperature, positive test for GC or CT, and elevated serum WBC would provide higher specificity and support the diagnosis of endometritis.

## ANALYSIS AND ANSWERS: THE MEDICO/LEGAL CASE FOR TREATING PARTNERS AS PATIENTS

McGregor JA, MD, CM, K. Paul, JD University of Colorado School of Medicine, Denver Health Medical Center & Panned Parenthood of the Rocky Mountains Inc. Denver, CO

**Goal:** Multiple lines of reasoning suggest that exposed contracts of index patients with sexually transmitted infections (STIs) and related syndromes such as PID should be contacted, screened and/or treated this should prevent reinfection and new infection in other contacts, as well as to reduce liability and costs. How to accomplish these multiple goals requires both medical and legal analyses.

**Methods:** We representatively sampled opinion leader practitioners in various fields including Obstetrics & Gynecology, Family Medicine, Pediatrics, Public Health, Sociology and Internal Medicine. We also identified guidelines published by authoritative organizations. We also examined available STI-related case law and systematically surveyed relvant state and federal statutes and regulations. We analyzed these data/information sets so as to optimized working partner treatment strategies which are available to providers and patients in various practice settings.

**Results:** 1) There is a paucity of authoritative clinical guidelines. 2) Expert providers differed greatly in recommendations. 3) Neither statutes, regulations, nor cases provide clear direction in this area. 4) Existing law permits a reasoned approach to partner treatment, and 5) controlled trials demonstrate benefits of several approaches toward partner/contact tracing and treatment. Recent studies demonstrate the efficacy of nucleic acid based testing, single dose treatments and tests of cure for both index patients and partners.

**Conclusion:** 1) There is support for regarding sex contacts/partner as "virtual" preferably, actual patient(s). 2) We suggest an ethics based approach with documentation a) direct contact and provision of written materials, b) use of nucleic acid amplified diagnostic testing c) directly observed treatment (DOT) with single-dose regimens in non allergic individuals, and d) provision of tests of cure (TOC) (self collected urine or swabs) one and three months after treatment for both index patients and partners. 3) A controlled prospective evaluation of these approaches is underway (CDC-RPA 455). 4) There is sufficient information to inform writing of "model laws" and recommendations which can enable care providers to provide direct care to partners.

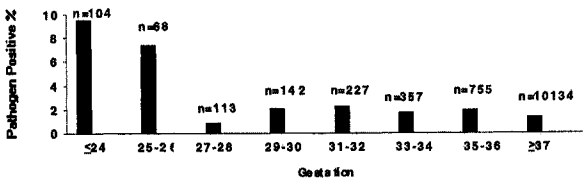
## CHORIOAMNION INFECTION AND PREGNANCY OUTCOME

S.L. Hillier, Ph.D.[1], M.A. Krohn, Ph.D.[1], L. Meyn[1], Z. Brown, M.D.[2] University of Pittsburgh, Dept. of Obstetrics, Gynecology and Reproductive Sciences, Pittsburgh, PA[1] and the University of Washington, Dept. of Obstetrics and Gynecology, Seattle WA[2].

**Objectives:** To describe the frequency, etiology and pregnancy outcomes associated with chorioamnion infection in a large unselected population of women.

**Study Design:** Placentas were collected at the time of delivery from 3328 deliveries at the University of Washington Medical Center from 1992-1995 and from 8585 deliveries at Magee-Womens Hospital from 1995-1996, for a total of 11,913 placentas. Culture swabs of the space between chorion and amnion were obtained by research personnel trained to avoid surface contamination. Specimens were inoculated onto blood, chocolate and Brucella agar for culture of aerobes and anaerobes.

**Results:** Most (97.5%) of the chorioamnion samples were culture negative. The recovered pathogens included Group B *Streptococcus* (n=60), coliforms (n=36), anaerobes (n=35), viridans streptococci (n=26), *G. vaginalis* (n=25) and yeast (n=3). The association of chorioamnion infection with gestational age is summarized below:




**Conclusions:** Published case-control studies have shown that chorioamnion infection occurs more frequently among preterm patients. In this large cross-sectional study, chorioamnion infection was infrequent, but was strongly associated with delivery prior to 26 weeks' gestation. Studies designed to evaluate treatment of lower genital tract infection for prevention of preterm birth should focus on prevention of delivery in the second trimester since that is the window in which infection-related outcomes primarily occur.

## THE ASSOCIATION OF BACTERIAL VAGINOSIS WITH POSTPARTUM ENDOMETRITIS AFTER VAGINAL AND CESAREAN DELIVERY

LA Lepine MD, J Hitti MD MPH, RP Nugent PhD, MA Krohn PhD, SL Hillier PhD, and DA Eschenbach MD. Department of OB/GYN, University of Washington and University of Pittsburgh and National Institutes of Health.

**Objectives**: Risk factors for endometritis after vaginal delivery have not been examined in detail. We explored demographic, obstetric, and microbiologic risk factors for postpartum endometritis (PPE) by mode of delivery.

**Study Design**: Data were analyzed from the Vaginal Infections and Prematurity Study, a multicenter, prospective study designed to assess

adverse pregnancy outcomes related to genital infection. Complete data related to PPE were available for 11,391 women. Cervical and vaginal cultures and vaginal Gram's stain and vaginal pH for the diagnosis of bacterial vaginosis (BV) were obtained at 23-26 weeks' gestation, and the women were followed for pregnancy outcome including PPE. Endometritis was defined as unexplained fever with uterine tenderness and/or foul smelling lochia. Analyses were stratified by mode of delivery, and logistic regression was used to calculate adjusted odds ratios (aOR) and 95% confidence intervals (CI) for the association between various risk factors and PPE.

**Results**: PPE was diagnosed in 89 (1%) of the 9027 women delivered vaginally and in 270 (11%) of the 2364 women delivered by cesarean. The following risk factors were associated with endometritis after vaginal birth: BV (aOR 2.2; CI 1.3-3.7), black or hispanic ethnicity (aOR 2.2; CI 1.1-4.4), internal monitor use during labor (aOR 1.9; CI 1.1-3.4), and rupture of membranes > 12 hours before delivery (aOR 2.4; CI 1.5-4.1). The same risk factors were identified for post-cesarean endometritis including BV (aOR 1.5; CI 1.0-2.2). The attributable risk for PPE accounted for by BV was 64% after vaginal birth and 37% after cesarean section. Chlamydia and gonorrhea were not associated with PPE in these analyses.

**Conclusions**: BV was associated with PPE after both vaginal delivery and cesarean section. This association was independent of ethnicity and intrapartum risk factors.

Supported by contracts HD-3-2832 through HD-3-2836 and AI-4-2532 from the National Institutes of Health.

**Saturday, August 7, 1999**
**General Sessions**
**Scientific Session VI**
**10:30 - 11:45 am**

## MATERNAL SERUM NITRIC OXIDE METABOLITES ARE LOWER IN PRETERM COMPARED TO TERM LABOR

KA Boggess MD, J Occhipinti MD, JP Locklear BS, and WNP Herbert MD, Duke Medical Center, Dept of OB/Gyn, Durham, NC

**Objectives:** Synthesis of nitric oxide and its metabolites ($NO_x$) are increased in response to infection, and in the serum of women who deliver prematurely. However, nitric oxide is a smooth muscle relaxant that is also believed to be involved in the maintenance of uterine quiescence. We sought to determine the relationship between maternal serum $NO_x$ levels and delivery associated with subclinical infection.

**Study Design:** Maternal serum samples were prospectively obtained from 104 women seeking obstetric care at Duke University. Maternal demographic and medical data were collected and dietary nitrite and nitrate levels were determined by the food frequency method. Serum $NO_x$ levels were measured using the Greiss reaction. Preterm was defined < 37 weeks. Subclinical infection was defined as the presence of placental histologic chorioamnionitis. Women were divided into four groups: antepartum, no labor (AP), preterm contractions, term delivery (PTC), preterm labor, preterm delivery (PTL), and term labor (TL). Comparison of maternal serum $NO_x$ levels was done using the Sign Rank test, and adjustment for dietary intake and subclinical infection was done using regression. To detect a 25% difference in $NO_x$, assuming a standard deviation of 10 μmol, 11 patients per group would be needed at $\alpha = .05$ and $\beta = .8$.

**Results:** After adjustment for dietary intake and subclinical infection, maternal serum $NO_x$ levels were lower in PTL versus TL groups.

| Study Group | n | Unadjusted $NO_x$ | Adjusted $NO_x$* | Adjusted $NO_x$** |
|---|---|---|---|---|
| AP | 22 | 36.6 (12.8-87.3) | 40.4 | - |
| PTC | 15 | 43.4 (15.2-105.6) | 32.2 | - |
| PTL | 26 | 35 (17.5-55.4) | 46.4 | 32.2 |
| TL | 41 | 38 (18.8-180.7) | 50.1 | 46.7 |

*adjusting for dietary intake, p=.04, ** adjusting for diet and subclinical infection, p=.06

**Conclusions:** After correcting for dietary intake nitrite and nitrate intake and subclinical infection, maternal serum $NO_x$ levels are lower in preterm versus term labor, suggesting that the mechanisms for maintenance of uterine quiescence may be abnormal in patients who ultimately deliver prematurely, even after adjusting for subclinical intrauterine infection.

## THE INTERNATIONAL ACYCLOVIR PREGNANCY REGISTRY: INTERIM RESULTS

Zane A. Brown, M.D., and the Acyclovir and Valacyclovir Pregnancy Registries Advisory Committee.

**Objectives:** When drugs are first marketed, insufficient data are available for making risk versus benefit assessments about use in pregnancy. Glaxo Wellcome established an Acyclovir [ACV] Pregnancy Registry (1984), and later a Valacyclovir [VACV] Pregnancy Registry (1996), to detect teratogenicity. Prospective collection of exposure and outcome data from pregnancies occurring in clinical trials and subsequent post marketing use is one method for providing these data for evaluation of risk.

**Study Design:** The Acyclovir and Valacyclovir Pregnancy Registries were established as international exposure and follow-up registries to monitor the outcome of pregnancies involving prenatal ACV or VACV use. Enrollment of new pregnancies ended July 1, 1998, and data acquisition of pregnancies undelivered at that time continues. Through 31 July 1998, 1207 pregnancy outcomes (includes 12 sets of twins) were prospectively obtained from 1195 pregnancies involving prenatal exposure to acyclovir. An advisory committee of independent scientists reviews data semiannually. Birth defects risk is the number of defects divided by combined number of outcomes with and without defects, excluding spontaneous and induced abortions not reporting birth defects.

**Results:** Of the 1195 ACV-exposed pregnancies, 739 had first trimester exposure. There were 19 (3.3%) infants with birth defects, 562 infants without birth defects (including the 7 sets of twins), 76 spontaneous abortions, and 82 induced abortions. There have been 94 pregnancies with prenatal use of VACV. Of these 94, 26 infants had first trimester exposures and 1 had a birth defect.

**Conclusions:** Data are insufficient for drawing definitive conclusions about the safety of ACV or VACV use in pregnancy, but the birth defect rate for each does not differ from the expected rate of 3% [(2-5%), Centers for Disease Control and Prevention]. For rare birth defects occurring at 1/1000 (e.g. cleft lip or palate), the sample size has the power to detect only increased risk greater than 4 times the expected.

## RANDOMIZED COMPARISON OF METRONIDAZOLE VAGINAL GEL VERSES NO THERAPY FOR ASCUS PAP SMEARS

M.S. Funk, J.M. Piper, L.E. Mieszerski, W.A. Peairs, V. Sabella, T.S.Wen. Dept. Ob/Gyn, UTHSC, San Antonio, Texas

**Objective**: To determine whether use of 0.75% Metronidazole Vaginal Gel can reduce the subsequent need for colposcopy by reducing persistence of atypia on repeat Pap smears.

**Study Design**: Nonpregnant women with atypical squamous cells of undetermined significance ("ASCUS") on Pap smears from Feb 1996 to the present were offered study participation. All participants had a vaginal specimen obtained for BV score at randomization and again at follow-up. Each was randomized to receive either Metronidazole Vaginal Gel (5 grams) daily for 5 days or no therapy. All participants were requested to return in 3-4 months for repeat Pap smear and BV score.
**Results**: To date, 100 women have been enrolled, of whom 49 were randomized to the study group and 51 to the control group. Overall, 44% of the women enrolled had BV at entry (40% of study, 49% of control, p=0.4). Thus far, 76 women (36 study, 40 control) have returned for follow-up. In the study group, Pap smear abnormalities reverted to normal in 67% with 6% progressing to higher grade lesions and 27% remaining ASCUS. The control group had 65% reversion to normal, 13% progression and 22% remained ASCUS. The Pap smear reversion rate among the women with BV at entry was 71% in the study group and 70% in the control group. The rate of BV at follow-up was 19% in the study group and 37% in the control group (p=0.1).
**Conclusions**: The use of Metronidazole Vaginal Gel was unable to significantly reduce the incidence of persistant atypia on Pap smears in this study despite a trend toward reduction in bacterial vaginosis.

## MICROFLORA CHANGES WITH THE USE OF A VAGINAL MICROBICIDE

Jeffrey F. Peipert, MD, MPH, Sharon Hillier PhD, Amy S. Cooper, CRNP, Lori Boardman, MD, Kenneth H. Mayer, MD, and the HIVNET Vaginal Microbicide Study Group, Brown University, Providence, RI and Magee-Womens Research Institute, Pittsburgh, PA.

**Objective**: To evaluate changes in vaginal microflora with the use of an acidic BufferGel (ReProtect LLC: IND# 49,744), a potential topical vaginal microbicide.
**Study Design**: An intensive, high dose tolerance trial was performed to evaluate the safety and acceptability of a novel acidic carbopol, BufferGel, as a vaginal microbicide. Women were instructed to use BufferGel once each day for 14 days, and if tolerated were asked to increase to twice daily dosing. Quantitative cultures of vaginal flora were performed using standard microbiologic techniques in a research laboratory. We analyzed 20 pairs of quantitative culture data (before and after use of BufferGel) from abstinent women and 17 pairs from low-risk sexually active women recruited from the greater Providence area. The primary outcome of interest for this sub-study was the change in hydrogen-peroxide producing lactobacilli.
**Results**: Within the entire cohort (N=37), 26 of 37 women (70%) were culture positive for hydrogen-peroxide producing lactobacilli before use of BufferGel and 27 of 37 (73%) were positive after use (NS). There was a statistically significant reduction in the prevalence of anaerobes (mostly gram positive cocci) after gel use (22%), compared to before gel use (51%, P=0.015). Gram negative rods (specifically *E. coli* in most cases) were more common after BufferGel (65%) than before gel use (24%, P=0.001).
**Conclusions**: Changes in vaginal ecosystem with the use of microbicides may affect the host's ability to defend against HIV and sexually transmitted infections. Studies evaluating these agents should quantify their effect on vaginal flora including lactobacilli and other aerobic and anaerobic bacterial species.

## LACK OF CORRELATION BETWEEN $CD_4$ COUNT AND GENITOURINARY TRACT INFECTIONS (GUI) IN PREGNANT WOMEN INFECTED WITH HIV

Mara J. Dinsmoor, Christine L. Tran. Dept of Obstetrics/Gynecology; Medical College of Va of VCU, Richmond, VA

**Objective** We hypothesized that in HIV+ pregnant women, the incidence of GU infections would increase as $CD_4$ count decreased.
**Study Design** We calculated the incidence of several different GUI using a prospectively maintained database of HIV+ pregnancies. Chi-square analysis and Kruskall Wallis ANOVA on ranks were used in analysis, with a p-value of $< .05$ considered significant.
**Results** We identified 98 consecutive continuing pregnancies with prenatal care at our clinics from 8/89 to 2/98. The mean age was 25.5 yrs and the mean $CD_4$ count at entry was 502. 35% acquired their infection through known heterosexual contact, 49% presumed heterosexual contact, and 13% by IDU. 90% were African-American.

| $CD_4$ (cells/mm$^3$) | > 500 (N=41) | 200-500 (N=47) | < 200 (N=10) | P-value |
|---|---|---|---|---|
| No infections | 27% | 19% | 30% | NS |
| Trichomonas | 24% | 33% | 20% | NS |
| BV | 15% | 19% | 10% | NS |
| Yeast | 39% | 40% | 40% | NS |
| UTI | 22% | 32% | 20% | NS |
| Gonorrhea | 2% | 13% | 10% | NS |
| Chlamydia | 15% | 6% | 30% | .09 |
| Syphilis | 3% | none | 40% | <.0001 |

The mean $CD_4$ count of patients with trichomonas was 521, BV 534, yeast 501, UTI 467, GC 351, chlamydia 545 and syphilis 459 (P=NS).
**Conclusions** In our pregnant HIV+ population, there was an increased incidence of syphilis in patients with $CD_4 < 200$, but there was no other relationship between $CD_4$ counts and incidence of GUI.

## SCIENTIFIC POSTER ABSTRACTS

**Thursday, August 5, 1999**
9:45 –10:45 am

**Poster # 1**

## POSSIBLE INVOLVEMENT of *UREAPLASMA UREALYTICUM* in the DEVELOPMENT of POST-PARTUM ENDOMETRITIS

Chaim W, Smolin A, Horowitz S, Ingel F, Mazor M. Dept. OB/GYN and Dept. of Microbiology and Immunology, Soroka University Medical Center, Ben-Gurion University, Beer-Sheva, Israel

**Objective:** To investigate the clinical significance of *Ureaplasma urealyticum* (Uu)
in the development of post-partum endometritis (PPE).
**Study design:** A preliminary screening of Uu in vaginal swabs of women with PPE was performed. Positive vaginal cultures for Uu (n=56), of the PPE patients (study group) were compared with positive vaginal cultures for Uu (n=44) from puerperal patients without PPE (control group). Anti-ureaplasma antibodies were measured by ELISA in the sera of all patients. Growth of ureaplasma by color changing units (which indicate positive culture vs negative culture only), showed no difference between the prevalence of Uu in the vaginal swabs of both groups. However, determination of the exact number of colony forming units (cfu) per each culture, showed a significant difference between patients with PPE when compared to controls.
**Results:** Culture positive PPE patients 39% (18/46) had $>10^5$ cfu/ml compared to the control group 11.8% (4/34) p=0.0048. Patients with PPE (fever $\geq 38^0$C, abdominal tenderness, WBC >12,000 and/or foul

smelling lochia) were treated with broad-spectrum antibiotics (Amoxycillin+ clavn, Gentamicin, Metronidazole, Cephazolin, Clindamycin), non-effective against Uu. Six of the patients required a change of antibiotics due to persistent septic fever. The second antibiotic combination included ciprofloxacin (5) and Ofloxacin (1)for fever remission. Both mildly effective against Uu.

**Conclusions:** The significant difference in Uu culture cfu between both groups suggests that Uu may play a role in the etiology of this infection, however, non-specific anti Uu treatment improved patients' condition. Thus, it is possible that either ureaplasma infection became self-limited or it was not the major cause of the PPE. No follow-up of discharged patients is available to reveal later probable ureaplasma infection that is characteristically a chronic one.

Further investigation is now carried out, including higher number of patients and determination of ureaplasma serotypes. Clinical significance of these data requires further evaluation.

**Poster # 2**

## USE OF PROTEASE INHIBITORS (PI) IN PREGNANCY DOES NOT INCREASE THE RISK OF ELEVATED GLUCOLA RESULTS (ABN GLU)

Scott T. Forrest, MD and Mara J. Dinsmoor, MD. Dept of Ob/Gyn, Medical College of Virginia of Virginia Commonwealth University, Richmond, VA

**Objectives:** One of the side effects of PI use in treating HIV infection is hyperglycemia. We hypothesized that HIV + pregnant women on PI would be more likely to have ABN GLU than those not on PI.

**Study Design:** Review of a database on all HIV+ patients with continuing pregnancies seen at our hospital. Those seen from 1997 to the present were included. Serum glucose measured one hour following 50gm glucola load. Statistical analysis included student's t-test and Fisher's exact test.

**Results:** 31 patients were seen between 1/1/97-5/1/99; 17 were on PI (9 prior to glucola). 3 did not have glucola performed due to scant prenatal care (1 on PI and 2 not on PI). Glucola was performed at a mean of 28.3 wks (± 2.6 wks). No patient had an abnormal glucola (> 140mg/dl)

| | PI (at glucola) (N=9) | No PI (at glucola) (N= 19) | P-value |
|---|---|---|---|
| Age (yrs) | 31.1 ± 6.5 | 26.3 ± 4.5 | .024 |
| Glu results (mg/dl) | 95 ± 13 | 104±19 | .21 |
| Median duration of PI prior to glucola (days) | 82 (20-230) | NA | |
| 27 of 31 have delivered: | PI (N=15) | No PI (N=12) | |
| GA at del (wk) | 38.3 ± 1.4 | 37.7 ± 1.8 | .34 |
| Birthweight (gm) | 2998 ± 405 | 3036 ± 496 | .83 |
| NN hypoglycemia | 2 (13%) | none | .49 |

**Conclusions:** Use of PI does not significantly increase the risk of an elevated glucola result nor is the mean glucola result increased in patients on PI. The incidence of neonatal hypoglycemia merits further study.

**Poster # 3**

## MICROBIAL ETIOLOGY OF PELVIC INFLAMMATORY DISEASE (PID) IN NAIROBI, KENYA: PRELIMINARY RESULTS

CR Cohen, JA Kiehlbauch, EA Bukusi, P Waiyaki, W Stamm, University of Washington, Kenya Medical Research Institute

**Objectives:** To determine the microbial etiology of PID in women with mild to moderate clinical symptoms in Nairobi, Kenya. To analyze the correlation between HIV-1 serostatus and microbial flora associated with PID.

**Study Design:** Since July 1998, we performed quantitative aerobic and anaerobic bacterial cultures onendometrial tissue from women with clinical PID recruited from an outpatient clinic in Nairobi as part of a randomized treatment trial of PID. Endometrial specimens were obtained using a PipelleO.

**Results:** To date, 68 endometrial specimens have been cultured. We isolated a mean of 5.4 aerobic (range 2-14) and 8.1 anaerobic bacterial colony types (range 2-23) from each specimen. Most (58/68) specimens contained true anaerobes. Concentrations of aerobes bacteria ranged from 10 to $10^9$ colony forming units (cfu) per gram of tissue and of anaerobes from 20 to $10^7$ cfu per gram of tissue. Table 1 depicts the bacteriological results from the first 68 endometrial specimens. A comparison of the prevalence of bacteria isolated from the endometrium of women with and without histologically confirmed endometritis while stratifying by HIV-1 serostatus will be performed.

**Table 1: Prevalence of Aerobic and Anaerobic Bacteria Commonly Cultured from the Endometrium of Women with Clinical PID in Nairobi, Kenya**

| Bacteria | Prevalence (%) |
|---|---|
| **Neisseria gonorrhoeae** | 16.2% |
| *Anaerobic cocci* | 39.7% |
| *Porphyromonas spp.* | 11.8% |
| *Prevotella spp.* | 51.5% |
| *Fusobacterium spp.* | 11.8% |
| *Group B Streptococcus* | 20.6% |
| *Gardnerella vaginalis* | 26.5% |
| *Lactobacillus spp.* | 13.2% |

**Conclusions:** Our preliminary results suggest that a wide diversity of aerobic and anaerobic organisms are associated with outpatient PID in Nairobi, Kenya.

**Poster # 4**

## SCREENING FOR GROUP B STREPTOCOCCUS - ARE WE DOING IT RIGHT?

HM McDonald PhD, JE Hiller PhD, P Darbyshire PhD and C Crowther RCOG. Women's & Children's Hospital, South Australia

The 1997 revised American Academy of Paediatrics guidelines* for prevention of group B Streptococcal (GBS) neonatal sepsis recommends screening for GBS in late pregnancy and antibiotic prophylaxis of maternal carriers in labour. The recommendations for site, timing and media are based on several studies carried out in the late 1970's and early 1980's. It therefore appeared prudent to verify the optimal methods for GBS screening .

**Objectives:** To determine the optimal site, gestation and method for screening for group B Streptococcus in late pregnancy.

**Study design:** Prospective study recruiting women at 28 weeks (w)- low vaginal (LVS) and perianal (PAS) swabs performed at 32w, 36

w and upon admission in labour. Culture methods- semi-quantitative estimation on horse blood agar plus selective broth (Todd-Hewitt broth with 10mg/L colistin and 15 mg/L nalidixic acid - Oxoid Supplement).
**Results:** Preliminary data from the first 9 months of the study shows-

| | LVS | PAS |
|---|---|---|
| Positive @ 32 w: | 133/715 (18.6%) | 137/659 (20.8%) |
| Positive @ 36 w: | 135/645 (21.0%) | 146/642 (22.7%) |
| Positive in labour: | 106/524 (20.2%) | 113/525 (21.5%) |

Comparison of isolation rates with and without selective broth at 36 w:

| | Agar & broth | Agar only |
|---|---|---|
| LVS | 145/693 (20.9%) | 109/693 (15.7%) |
| PAS | 157/690 (22.8%) | 102/690 (14.8%) |

**Conclusions:** These results show:
- use of selective broth increases the LVS isolation rate by 33% and PAS by >50%
- perianal carriage was 6 to 12 % higher than vaginal carriage
- highest carriage was at 36 w but differences between gestations were not significant

*Reference: Revised AAP Guidelines- Pediatrics 1997; 99(3): 489-496

**Poster # 5**

**ANTIBIOTIC RESISTANCE IN GROUP B STREP ISOLATES FROM NONPREGNANT WOMEN**

T.S. Wen, J.M. Piper, W.A. Peairs, K. Mills. Dept. Ob/Gyn, UTHSC, San Antonio, TX.

**Objective:** Routine screening for GBS is not performed outside of pregnancy, but GBS may be isolated from urine and genital cultures. We sought to determine the rates of antibiotic resistance among GBS isolates from nonpregnant women and identify factors associated.
**Study Design:** All GBS isolates from nonpregnant women identified by the University Hospital laboratory from March, 1998 to the present were analyzed for sensitivity to penicillin G, ampicillin, clindamycin, erythromycin, vancomycin and cephalothin utilizing disk diffusion and minimal inhibitory concentration (MIC) by serial dilution. Resistance was defined by standard criteria. Resistant isolates were also tested for sensitivity to azithromycin by disk diffusion. Medical history was obtained from the medical record.
**Results:** 68 GBS isolates from nonpregnant women have been analyzed thus far, with no isolates found to be resistant to penicillin G, ampicillin, vancomycin or cephalothin by either technique. Clindamycin resistance was identified in isolates from 7 women (10.3%) by both disk diffusion and MIC. Erythromycin resistance was noted in isolates from 11 women (16.2%) by both disk diffusion and MIC. All isolates resistant to erythromycin were also resistant to azithromycin. Overall, 11 of the 68 isolates (16.2%) had evidence of antibiotic resistance (all clindamycin resistant isolates were also erythromycin and azithromycin resistant). Resistance was identified in GBS isolates from both genital (7/39, 17.9%), and urinary (4/25, 16%) sites. There were no resistant isolates from other sites (IUDs, abscesses). Thus far, 3 of 13 isolates (23%) from diabetic women were resistant.
**Conclusions:** Resistance to clindamycin and/or erythromycin can be identified in GBS isolates from nonpregnant women. Clindamycin/erythromycin use for GBS urinary tract infection or lower genital tract infection may provide inadequate coverage.

**Poster # 6**

**THE OBSTETRICIAN/GYNECOLOGIST (OB/GYN) ROLE IN VACCINE PREVENTABLE DISEASES (VPD) AND IMMUNIZATION**

B. Gonik, M.D., T. Jones, M.D., D. Contreras, M.S., N. Fasano, M.A., Depts OB/GYN, Family & Child Ecology, Wayne State Univ, Mich State Univ, and the Mich Dept Comm Hlth (MDCH)

**Objective:** The MDCH in collaboration with the American College of OB/GYN (ACOG) and the Centers for Disease Control (CDC) undertook a survey to assess the immunization role currently played by OB/GYN's in Michigan.
**Study Design:** Blinded questionnaires requesting demographic, knowledge-based, practice and attitudinal data were sent to 800 ACOG-registered fellows.
**Results:** Two hundred and five (26% return rate) physicians responded. Most were male (68%) and graduated from medical school between 1970-89 (64%). The majority provided both OB and GYN services, although the minority specifically identified themselves as primary care providers to adolescent (26%), reproductive-aged (47%), or postmenopausal (34%) women. Only 13% of respondents felt that screening for VPD falls outside the realm of routine OB/GYN care. Most indicated that in their practice they assessed OB patients for Hepatitis B (70%) and MMR (71%) vaccine needs, but fewer evaluated gravidas for influenza (42%), varicella (39%), tetanus (25%), or pneumococcus (19%) vaccine needs. Practitioners assessed their nonobstetric patients less than half the time for any VPD (range 22-43%). The most common reason for not giving an indicated vaccine was that it was not part of their "usual care" (55%), followed by cost/reimbursement concerns (50%) and lack of office availability (42%). A wide range in knowledge level was identified concerning VPD, immunization recommendations, and vaccine safety.
**Conclusions:** These data suggest a discrepancy between the OB/GYN physician perceived responsibilities and actual practice patterns as related to VPD and the immunization of women. Limitations in current knowledge and practical concerns specific to vaccine administration contribute to this disparity.

**Poster # 7**

**EARLY NEONATAL CANDIDAL COLONIZATION IS ASSOCIATED WITH LENGTH OF RUPTURED MEMBRANES AND ROUTE OF DELIVERY**

KA Boggess MD, JD Whitehouse MD, RJ Everts MB, RN Goldberg MD, and K Kirkland MD. Duke University Medical Center Depts. Ob/Gyn, Pediatrics and Internal Med. Durham, NC

**Objectives:** Infants in neonatal intensive care units are at increased risk for fungal infections. We sought to determine the prevalence and epidemiology of yeast colonization in a neonatal intensive care unit and to correlate with maternal factors.
**Study Design:** A prospective surveillance culture study in our NICU was carried out over 20 weeks. Neonatal perineal swabs were obtained at biweekly intervals with a sterile culturette then inoculated onto an inhibitory mold agar with gentamicin and chloramphenicol. Yeast speciation was done by standard methods. Statistical tests used were the Wilcoxon rank sum test, student's t-test and Fisher's exact test, with statistical significance set at $p<.05$.

**Results:** During the study period, 261 perineal cultures were obtained from 138 neonates. Candida was isolated in 47 (34%) of the 138 infants. Of the 47 isolates, 33 (24%) were *C. albicans*, 11 (8%) were *C. parapsilosis*, and 1 each were *C. glabrata*, *C. tropicalis*, and *H. anomala*. 28 (61%) of the 47 colonized infants were positive within the first two weeks of life. Colonized infants had earlier gestational age and lower birthweight than noncolonized infants. In infants colonized early, mode of delivery and length of time of ruptured membranes was significantly associated with colonization.

| | n | Gestational age (weeks)* | Mean birth-weight(g)** | Vaginal Delivery*** | ROM (hours)**** |
|---|---|---|---|---|---|
| Non-colonized | 91 | 32 (23-41) | 1967 ± 907 | 44/89 (49%) | 2 (0-336) |
| Colonized | 47 | 28.5 (23-41) | 1442 ± 906 | 27/46 (59%) | 5.5 (0-336) |
| Early colonized | 28 | 32 (24-40) | 2140 ± 898 | 19/26 (73%) | 7.5 (0-336) |

*p=.01, noncolonized vs. colonized; **p<.002, noncolonized vs. colonized; ***p=.02, early vs. noncolonized; ****p=.003 early vs. noncolonized and vs. colonized.

**Conclusions:** At least one-third of infants admitted to our NICU are colonized by yeast, which appears to be related to gestational age and birthweight. Infants colonized early are more likely to have delivered vaginally and be exposed to vaginal flora for a longer time than those not colonized, suggesting vertical transmission at the time of birth.

**Poster # 8**

## GROUP B STREP RESISTANCE TO ANTIBIOTICS AND PERIPARTUM OUTCOMES

J.M. Piper, T.S. Wen, W.A. Peairs, K. Mills. Dept. Ob/Gyn, UTHSC, San Antonio, TX.

**Objective:** Emerging antibiotic resistance among GBS strains has been reported. We sought to determine the incidence of antibiotic resistance in our inner-city Hispanic population and evaluate peripartum infectious morbidity from resistant strains.

**Study Design:** All GBS isolates from pregnant women identified by the University Hospital laboratory from March, 1998 to the present were analyzed for sensitivity to penicillin G, ampicillin, clindamycin, erythromycin, vancomycin and cephalothin utilizing disk diffusion and minimal inhibitory concentration (MIC) by serial dilution. Resistance was defined by standard criteria. Resistant isolates were also tested for sensitivity to azithromycin by disk diffusion. Maternal and neonatal outcome data were obtained upon delivery.

**Results:** 283 GBS isolates from 242 pregnant women have been analyzed thus far, with no isolates found to be resistant to penicillin G, ampicillin, vancomycin or cephalothin by either technique. Clindamycin resistance was identified in isolates from 6 women (2.5%) by both disk diffusion and MIC. Erythromycin resistance was noted in isolates from 24 women (10%) by both disk diffusion and MIC. All isolates resistant to erythromycin were also resistant to azithromycin. Overall, 32 of the 283 isolates (11%) had evidence of antibiotic resistance (all clindamycin resistant isolates were also erythromycin and azithromycin resistant). Resistance was identified in GBS isolates from both genital (20/210, 10%), and urinary (4/28, 13%) sites. Intra-amniotic infection occurred in 18% of resistant and 13% of non-resistant cases. We have not yet identified neonatal sepsis due to failure of antibiotic prophylaxis in cases with resistant GBS.

**Conclusions:** Resistance to clindamycin and/or erythromycin can be identified in GBS isolates from pregnant women. Clindamycin/erythromycin use for GBS prophylaxis may provide inadequate coverage. Alternative prophylaxis schemes should be considered for penicillin-allergic women. Vancomycin may be the best alternative for prophylaxis.

## REDUCTION OF PREMATURITY BY PH-SCREENING - THE '98 STATE

Udo B. Hoyme, M.D.[1], A. Grosch, M.D.[3], V.M. Roemer, M.D.[2], E. Saling, M.D.[3]
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[2]Department of Gynaecology and Obstetrics, Klinikum Detmold
[3]Institute of Perinatal Medicine, Berlin, Germany

**Objectives:** Bacterial vaginosis (BV) increases the relative risk of prematurity. In these cases the preterm birth rate can be reduced by early intervention with antimicrobial substances, e.g. clindamycin.

**Study design:** Women seeking prenatal care in one of 29 outpatient offices of the city beginning 10/96 were informed and requested to practice self-measurement of the vaginal pH every three days in order to screen for BV: Care Plan VpH gloves (Selfcare, Oberhachingen) were used in identifying patients at risk by means of a pH $\geq$ 4.7. These women were instructed to see their physician immediately to have BV possibly confirmed and treatment with clindamycin cream (Sobelin, Upjohn, Heppenheim) i.vag. initiated, otherwise lactobacilli $10^7$/estriol 0.03 mg (Gynoflor, Nourypharma, Oberschleißheim) were administered i.vag for 6 days. Patients of 13 not participating local obstetricians and women not consenting to participate in the study served as controls.

**Results:** Up to 11/98 69 out of 372 women in the intervention group were identified with a pH > 4.4. 58 were treated with lactobacilli, 17 additionally with clindamycin cream because of BV and 3 had no therapy. In this ongoing study the prematurity rate was 8.3% in the intervention group vs. 12.9% in controls (n=2.040; $p < .05$). 0.3% vs. 3.3% of the neonates were born at $\leq$ 32 gestational weeks ($p < .01$). PROM was registered in 22.6% vs. 31.2% ($p < .001$) respectively.

**Conclusion:** Self-measurement of vaginal pH at close intervals according to Saling seems to identify women at risk for prematurity. Earliest possible intervention either with lactobacilli or in case of confirmed BV with clindamycin appears to result in a reduction of preterm birth and in particular of newborns $\leq$ 32 weeks.