

368.60), and who currently reported illicit drug use (aOR 3.45; 95% CI 0.71, 15.05) had a higher odds of repeat *T. vaginalis* infection.

**CONCLUSION:** Although this study had a small sample size, symptomatic women and those receiving the 2 gram stat dose of metronidazole may be at higher risk for repeat *T. vaginalis* infection during pregnancy. Future studies are needed to elucidate the optimal *T. vaginalis* treatment regimen in pregnant women.

**LEARNING OBJECTIVES:** Identify the predictors of reinfection with *Trichomonas vaginalis* in pregnant women living in the Southern United States.

### 11 Patterns and predictors of delayed treatment and tests of reinfection for chlamydia and gonorrhea infections in pregnancy



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**OBJECTIVES:** To describe the patterns of treatment and tests of reinfection (TOR) for chlamydia and gonorrhea in pregnancy. To investigate factors associated with delayed treatment and TOR.

**METHODS:** Retrospective cohort study of women who delivered at a single public hospital between July 1, 2016 and June 30, 2018. A positive chlamydia or gonorrhea infection was defined as positive result on nucleic acid amplification testing. Fisher's exact and Kruskal-Wallis H test were used to compare proportions and times to treatment and TOR by STI diagnosis. We used a shared frailty cox proportional hazards model to investigate factors associated with delays in treatment and TOR. An alpha of 0.05 was employed for all tests of significance.

**RESULTS:** Among 3,349 women, 378 (11.3%) tested positive and 91 (2.7%) were not tested. These 378 positive women contributed 351 unique cases of chlamydia, 51 cases of gonorrhea, and 46 co-infections. Overall, 94.9% of cases received antibiotic treatment, with the proportion treated differing by STI diagnosis (chlamydia = 96.3%, gonorrhea = 88.2%, co-infection = 91.3%,  $p = 0.02$ ). Time to treatment ranged from zero to 221 days with 56% and 19.5% receiving treatment greater than one and four weeks after testing, respectively. Treatment occurred during hospital admission for delivery in 25 cases (5.9%), including the case whose treatment took 221 days to initiate. Time to treatment did not differ significantly by STI diagnosis ( $H = 3.60$ ,  $p = 0.17$ ). A TOR was completed 21 days or more after treatment in 74.8% of cases. TOR was delayed by more than one month in 30.5% of cases. Time to TOR and proportion having a TOR did not differ significantly by STI group ( $H = 1.62$ ,  $p = 0.45$ ; chlamydia = 72.5%, gonorrhea = 82.2%, co-infection = 85.7%,  $p = 0.09$ ). The only demographic or clinical variable that predicted delays in treatment and TOR was increasing gestational age at diagnosis (treatment HR = 1.03, 95% CI = 1.02, 1.04; TOR HR = 1.04, 95% CI = 1.02, 1.05).

**CONCLUSION:** A substantial proportion of chlamydia and gonorrhea cases experienced delays in treatment and TOR, and a lower proportion of cases involving gonorrhea were treated compared to chlamydia. This may be due in part to the need to report in person for administration of ceftriaxone. Given the impact of treatment on reducing adverse pregnancy outcomes such as preterm birth, point of care testing should be considered in high risk populations in order to expedite treatment.

**LEARNING OBJECTIVES:** Learners will be able to identify patterns of chlamydia and gonorrhea treatment and tests of reinfection during pregnancy.

### 12 Mechanisms of 5-nitroimidazole resistance in trichomonas vaginalis: a systematic review of the literature



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**OBJECTIVES:** *Trichomonas vaginalis* is the most common non-viral STI affecting an estimated 3.7 million men and women in the U.S. and over 200 million worldwide. Currently approved drugs are from the 5-nitroimidazole class (i.e. metronidazole and tinidazole) however resistance rates can range from 5-10%. The objective of our study was to perform a systematic review of the literature on mechanisms of 5-nitroimidazole resistance in *T. vaginalis*.

**METHODS:** A systematic review of original research focusing on mechanisms of 5-nitroimidazole resistance in *T. vaginalis* over the past 60 years was performed. The PubMed, Science Direct, and EMBASE databases were searched using the keywords: *Trichomonas vaginalis*, trichomoniasis, 5-nitroimidazole, metronidazole, tinidazole, and drug resistance. Foreign language articles and articles not containing *T. vaginalis* resistance testing on the two drugs of interest were excluded.

**RESULTS:** The search yielded 132 results, of which 103 articles were excluded, leaving 29 results. Drug resistance can arise aerobically or anaerobically. It can also potentially arise through infection of *T. vaginalis* with *Mycoplasma hominis* or *T. vaginalis* virus (TVV). Resistance to 5-nitroimidazoles involves different proteins and enzymes involved in drug activation including pyruvate: ferredoxin reductase, ferredoxin, Nitroreductase, hydrogenases, Thioredoxin reductases, and flavin reductases. Evidence suggests that resistance may depend on intracellular oxygen and iron concentrations as well. There also appears to be a distinguishable difference in the prevalence of drug resistance based on the genetic diversity of *T. vaginalis* and its two population types with higher nitroimidazole resistance seen in type 2 populations as opposed to type 1 populations.

**CONCLUSION:** Drug resistance to 5-nitroimidazoles is facilitated by the differential expression of enzymes and proteins involved in drug activation, intracellular oxygen and iron concentrations, and genetic mutations in the *T. vaginalis* genome. Resistance prevalence varies depending on the 5-nitroimidazole used to treat trichomoniasis. Resistance to one 5-nitroimidazole can lead to the development of resistance to others within the drug class. Therefore, new alternative methods of treatment outside of the 5-nitroimidazole class, as well as a more complete understanding of the mechanisms behind 5-nitroimidazole drug resistance are needed.

**LEARNING OBJECTIVES:** Learners will be able to recognize the underlying mechanisms of 5-nitroimidazole resistance.

### 13 Predictors of trichomoniasis in pregnancy: a retrospective study in a high-risk population in Atlanta, Georgia



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**OBJECTIVES:** To identify the prevalence and factors associated with trichomoniasis in pregnancy

**METHODS:** We conducted a retrospective cohort study of women who delivered between 2016 and 2018 at a single institution who were tested for trichomoniasis during pregnancy. Demographic and clinical characteristics were abstracted from the electronic medical

record. Characteristics including race, age, prenatal care variables, and other sexually transmitted infections were examined. We used multivariable Poisson regression to analyze factors associated with trichomoniasis.

**RESULTS:** Among 1,576 women who received Nucleic Acid Amplification Testing, 245 (16%) were positive for trichomonas. Non-Hispanic black race/ethnicity, tobacco use during pregnancy, coinfection with chlamydia during pregnancy, and more frequent triage visits during prenatal care were associated with an increased risk of trichomoniasis.

**CONCLUSION:** While routine testing and treatment of asymptomatic trichomoniasis during pregnancy remains controversial, the high burden of infection among pregnant women and increased risk of preterm birth seen in some studies suggests a critical need for the improvement in prevention. More information is needed to elucidate the complicated relationships between trichomoniasis, treatment and subsequent birth outcomes.

**LEARNING OBJECTIVES:** Learners will be able to identify the prevalence and predictors associated with trichomoniasis in pregnancy

#### 14 Peripartum clostridium difficile infection: a 10-year experience at a single obstetric hospital, 2008-2018

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**OBJECTIVES:** To determine the incidence, clinical presentation, risk factors, complications and recurrence rates of peripartum *Clostridium difficile* infection (CDI) at our institution over 10 years.

**METHODS:** A retrospective review of all women ages 15-50 years testing positive for CDI infection at our institution during pregnancy or within 6 months postpartum between 2008 and 2018. Demographic, clinical and pregnancy characteristics were collected, and antibiotic use, antibiotic indications, treatment regimens and recurrence rates were reviewed. Descriptive statistics were utilized.

**RESULTS:** Forty-two cases of CDI among 96,024 deliveries were identified between 2008 and 2018, yielding a peripartum CDI rate of 0.04%. Fifty-two percent of cases were diagnosed antepartum with a mean gestational age of 25+6 weeks, and 47% (20/42) were diagnosed postpartum. Among all cases, 85.7% (36/42) had prior antibiotic use and 54.8% (23/42) had been hospitalized prior to CDI. Delivery hospitalizations accounted for 78.3% of all admissions prior to CDI diagnosis. The most common indications for antibiotics were chorioamnionitis/endometritis (31%; 11/36), cesarean section prophylaxis against surgical site infection (25%; 9/36), skin/soft tissue infections (17%; 6/36), pyelonephritis or UTI (14%; 5/36) and dental infections (8%; 3/36). The most common antibiotic associated with CDI was clindamycin (31%; 13/36). Diarrhea was a presenting symptom for CDI in 90.5% (38/42); other presenting symptoms were fever (23.8%; 10/42) and abdominal pain (35.7%; 15/42). One patient was transferred to an acute medical service; there were no maternal ICU admissions. Among women diagnosed antepartum, one delivered preterm, two were subsequently diagnosed with fetal growth restriction at term, and one neonate was admitted to the NICU at delivery. There were no neonatal deaths or other pregnancy complications. Only 4.8% (2/42) had a recurrence of CDI.

**CONCLUSION:** Peripartum women are at risk for CDI despite their relatively younger age and low incidence of comorbidities. Antibiotic

exposure is the most common risk factor among patients with peripartum CDI, and disease was relatively mild with few recurrences in this cohort. Clinicians should consider CDI as a potential diagnosis in pregnant or postpartum women who present with diarrhea, with or without fever, especially after prior antibiotic exposure and even without prior health care facility exposure.

**LEARNING OBJECTIVES:** Learners will be able to identify risk factors and complication rates for CDI infection in the peripartum period.

#### 15 Disparities in group b streptococcus screening during pregnancy in Latin America

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**OBJECTIVES:** To determine the rates of maternal GBS screening during pregnancy and to identify demographic characteristics associated with maternal GBS screening in Latin America.

**METHODS:** We conducted a retrospective cohort study using de-identified records of pregnant women living in one of twelve Latin American countries, who received prenatal care at a participating facility from January 1, 2009 through December 31, 2012. Screening rates for GBS were determined. Chi-Square tests were used for comparison of four demographic variables: ethnicity, age, education level attained, and civil status. Binomial logistic regression was performed and odds ratios were calculated to examine the effects of four demographic variables (ethnicity, schooling, civil status, and mother's age group) on the likelihood of maternal screening for GBS. Given that Uruguay had the highest rate of screening and contributed the most records to the database from 2009-2012, we stratified our analysis to determine if Uruguay was an effect modifier. We then calculated prevalence of GBS among Uruguayan women and used Chi-Square tests to compare association of GBS positivity with ethnicity, age, education level, and civil status.

**RESULTS:** From 2009 to 2015, 712,061 records were collected in the database, of which 498,363 records with data for GBS screening from 5 countries (Uruguay, Bolivia, Nicaragua, Honduras, and El Salvador) were analyzed. GBS screening among pregnant women in Latin American was less than 15% for every country except, Uruguay which routinely screened greater than 65% of women. The final regression model, with Uruguay, included ethnicity, maternal age group, education level and civil status. Uruguay was an effect modifier; the model accounted for 64.1% of the total variance when including Uruguay and 1% of the total variance when excluding Uruguay. Non-white women and younger women were less likely to be screened than white and older women respectively. In Uruguay, the average GBS prevalence over the study period was 18.5%. Black women, older women and women without a primary education had higher rates of GBS colonization (21.3%, 20.4% and 21.9% respectively).

**CONCLUSION:** Our study results highlight the need for national policy as well as investments in regional training and support for Latin American countries in order to increase GBS screening rates and develop a more complete understanding of the prevalence of maternal GBS colonization in the region.

**LEARNING OBJECTIVES:** Identify demographic characteristics associated with a decreased likelihood of GBS screening among pregnant women in Latin America.

