

**LEARNING OBJECTIVES:** Learners will be able to characterize the effectiveness of CMV HIG at prevention of congenital CMV infection among women with primary CMV in early pregnancy

### 13 Real-world outcomes associated with nucleic acid amplified versus direct DNA probe testing for vaginitis



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**OBJECTIVES:** To address the ongoing discussion related to the costs of diagnosing vaginitis the study compared the impact of diagnoses using nucleic acid amplified testing (NAAT) with direct DNA probe (DP). Real-world outcomes using commercial medical claims data compared the diagnostic and therapeutic costs among vaginitis patients between a general population of women and women with diabetes.

**METHODS:** The IBM Watson Health MarketScan® Commercial database was used to identify women aged 18 to 64 years with evidence of a new diagnosis of vaginitis that occurred between 2012 and 2017. Patients were stratified by type of testing used to determine the vaginitis diagnosis. All-cause healthcare expenditures were measured during 6-month and 12-month follow-up periods. Outcomes were described by testing cohort (NAAT, DP) and patient type: general and diabetic (Type I, II).

**RESULTS:** In total, 207,113 women with commercial insurance met the inclusion and exclusion criteria (NAAT cohort, N=108,559; DP cohort, N = 98,554) a sub-cohort of 12,522 women with diabetes (NAAT cohort, N=6,463; DP cohort, N = 6,059) was analyzed separately. Overall healthcare costs among all patients were higher in the DP cohort in the 6-month follow-up period (\$5,042 DP vs \$4,872 NAAT, p=.0025) and 12-month follow-up period (\$9,366 DP vs \$8,938 NAAT, p<.0001). In the cohort of women with diabetes, the NAAT group trended lower in both the 6 months (\$9,344 DP vs \$8,972 NAAT) and in the 12 months following the diagnosis (\$17,715 vs \$17,083 NAAT) although not statistically significant.

**CONCLUSION:** NAAT testing for vaginitis reduces healthcare costs compared to DP in the general population. While managing vaginitis among women with diabetes presents challenges for the clinician, more information will be helpful to understand how a NAAT test may provide improved outcomes and impact patient management decisions.

**LEARNING OBJECTIVES:** Learners will be able to describe the healthcare resource utilization and costs of vaginitis diagnosis associated with use of NAAT and DP tests.

### 14 Characterizing the vaginal microbiome in women with recurrent bacterial vaginosis and treatment implications



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**OBJECTIVES:** We aimed to characterize the vaginal microbiome in women with recurrent bacterial vaginosis (BV) compared to women without infection, and to describe the effect of oral metronidazole treatment on the microbiome of recurrent BV.

**METHODS:** Women aged 18-40 years, with recurrent BV, were prospectively enrolled. Vaginal samples (lavage) were collected at baseline (D0), at 7-10 days (D7) and 30-40 days (D30) after initiation of oral metronidazole treatment (500mg BID, 7 days). DNA was extracted, amplified using primers targeting the V3-V4 region of the

16srRNA, and then sequenced and processed through a hybrid Qiime MICCA bioinformatics pipeline.

**RESULTS:** Sixty-three participants, 17 recurrent BV patients and 46 controls, were enrolled. Beta diversity (p=0.045), but not alpha diversity (p=0.076) differed significantly between recurrent BV and control groups. The genera Gardnerella and Prevotella were relatively more abundant, while Lactobacillus was relatively less abundant in recurrent BV vs. control groups. Alpha diversity decreased (p=0.0049) after treatment with oral metronidazole, but increased (p=0.0062) to near baseline by D30. Metronidazole treatment resulted in an increase in Lactobacillus and decrease in Gardnerella that was not maintained after 30 days. Of the 10 recurrent BV patients with data for all three time points, 4 relapsed by D30. Beta diversity (p=0.044), but not alpha-diversity (p=0.07), differed significantly between patients that relapsed and those that did not.

**CONCLUSION:** Recurrent BV patients have significantly different beta diversity, less Lactobacillus and more Gardnerella and Prevotella, when compared to control patients. Oral metronidazole is associated with a decrease in alpha diversity, increased levels of Lactobacillus and decreased amounts of Gardnerella.

**LEARNING OBJECTIVES:** Learners will be able to describe (1) the composition of the vaginal microbiome in women with recurrent BV and how it differs from that of controls (2) how the vaginal microbiome of women with recurrent BV changes with metronidazole treatment.

### 15 Diagnostic accuracy of clinical criteria for bacterial vaginosis, vulvovaginal candidiasis and BV/VVC co-infections



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**OBJECTIVES:** Approximately 8-18% of women having vaginal symptoms have been reported to have concurrent BV and VVC. The objective of this study was to assess the agreement between laboratory and clinical diagnosis of BV alone, VVC alone and BV/VVC co-infections when standardized criteria were employed in the context of a clinical treatment trial.

**METHODS:** Between 6/5/15 and 5/31/18, 1315 women were screened for a clinical trial evaluating treatment of vaginal infections at 51 sites in the US. Clinical diagnosis of BV was based on four Amsel criteria (discharge, vaginal pH >4.5, positive whiff test, ≥ 20% clue cells). Diagnosis of VVC was based on composite signs and symptoms score ≥2 (itching, burning, irritation, edema, erythema, excoriation) plus hyphae/pseudohyphae or yeast buds in vaginal fluid. Women having clinically documented co-BV/VVC had to meet the criteria for both conditions. Vaginal smears for diagnosis of BV using the Nugent criteria and vaginal swab samples were shipped overnight to a centralized laboratory for cultivation of yeast on Sabouraud's agar. A total of 891 women were randomized to treatment; Gram stains, vaginal yeast cultures or both were missing for 19 women leaving an evaluable population of 872 women..

**RESULTS:** The study population had a median age of 29 (range 17-66) and was 33.7% white, 62.7% black and 3.6% other self-reported race. Of the 194 women diagnosed with BV alone, 156 (80%) had a Nugent score ≥7, but 42 (22%) also had yeast detected by culture, with 33 (20%) women having both BV and yeast based on lab testing. Among 207 women diagnosed with VVC alone, only 147 (71%) had a positive yeast culture and 34 (16%) had a Nugent score ≥7. Based on lab testing, both BV and yeast were present in 29

(14%) of women diagnosed as having VVC alone. Of the 471 women diagnosed as having co-BV/VVC based on clinical criteria, only 191 (41%) had culture confirmation of yeast plus a Nugent score of  $\geq 7$ . Of the remaining women, 105 (22%) had BV alone, 126 (27%) had yeast alone, and 49 (10%) had neither BV nor yeast. Intermediate Nugent scores of 4-6 were noted in 109 (23%) of women diagnosed with co-BV/VVC.

**CONCLUSION:** In this large multicenter study employing standard clinical diagnostic algorithms for BV, VVC, and co-BV/VVC, possible mixed infection occurred in 14-20% of women diagnosed as having a single condition, while clinical diagnosis of co-BV/VVC was lab confirmed in fewer than half. Reliance on clinical criteria for diagnosis of BV and/or VVC can lead to misdiagnosis.

**LEARNING OBJECTIVES:** Describe the limitations of clinical criteria for diagnosis of bacterial vaginosis and vulvovaginal candidiasis, especially when present as co-infections.

### 16 Elevated risk of bacterial vaginosis among copper intrauterine device users: a prospective cohort analysis



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**OBJECTIVES:** To evaluate the association between copper IUD (Cu-IUD) use and bacterial vaginosis (BV) incidence among women enrolled in the MTN-020/ASPIRE trial.

**METHODS:** This secondary analysis includes 2,614 HIV-negative women ages 18-45 from Malawi, South Africa, Uganda and Zimbabwe. Women reported use of Cu-IUD, injectable contraceptives (DMPA, NET-EN), oral contraceptives (OC), implants containing etonogestrel or levonorgestrel, or none/other non-hormonal contraception at monthly visits. BV was evaluated by Nugent score at 6-monthly intervals. We used Andersen-Gill proportional hazards models to evaluate the association between contraceptive method and BV. Among new Cu-IUD users, we used generalized estimating equations to test changes in incidence following initiation and subsequent discontinuation of Cu-IUD. All models were adjusted for potential confounders, including number of sexual partners, condom use, partner circumcision status, intravaginal practices, and study site.

**RESULTS:** Throughout follow-up, DMPA was the most commonly used contraceptive (47%), followed by implant (32%), Cu-IUD (24%), OC (21%), NET-EN (19%), and none/other non-hormonal contraception (15%). Relative to women using none/other non-hormonal contraception, women using Cu-IUD had higher BV incidence (138 cases per 100 person-years [95% CI: 130, 147] vs. 112 [95% CI: 98, 127]; HR: 1.27, 95% CI: 1.10, 1.46). Results were

similar when comparing BV incidence among Cu-IUD users to OC and implant users. Among 304 women who initiated Cu-IUD during follow-up, BV incidence increased nearly two-fold in the 6 months following initiation relative to the 6 months prior to initiation (RR: 1.91, 95% CI: 1.46, 2.50). Seventy-four (24%) women subsequently discontinued Cu-IUD use; BV incidence remained elevated in the 6 months following discontinuation (RR: 1.58, 95% CI: 1.10, 2.27), then was similar to pre-initiation rates within one year (RR: 1.13, 95% CI: 0.71, 1.81).

**CONCLUSION:** These data add to the growing body of evidence that Cu-IUD users have an elevated risk of BV, and further suggests that Cu-IUD discontinuation is associated with decreased risk within a year. Women and their providers may wish to consider BV risk when discussing contraceptive options. Future research should investigate the mechanism(s) by which Cu-IUD use increases BV risk, as well as a potential mediating role of BV in increasing HIV risk among Cu-IUD users in settings with high HIV incidence.

**LEARNING OBJECTIVES:** Learners will be able to describe the association between Cu-IUD use and incident bacterial vaginosis.

### 17 Results of a phase 3, randomized, double-blind, placebo-controlled study to evaluate the efficacy and safety of astodrimmer gel for prevention of recurrent bacterial vaginosis



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**OBJECTIVES:** To determine the efficacy and safety of Astodrimmer Gel in reducing recurrent BV in women with a history of recurrent BV.

**METHODS:** A total of 864 women aged 18-45 were enrolled at 67 centers in the US, Canada, Mexico and Puerto Rico. The target population was women with a history of recurrent BV (episodes in the past year), and a current diagnosis of BV by 3/4 Amsel criteria and Nugent score (NS) 4. Women received a 7-day course of oral metronidazole (500mg BID) for their BV. Subjects successfully treated (no symptoms, Amsel criteria for discharge, whiff test and clue cells all negative) were randomized 1:1 to receive 5g of Astodrimmer 1% Gel (N=295) or placebo (N=291), vaginally, QOD for 16 weeks. Women were evaluated every 4 weeks for BV recurrence. Those who remained recurrence-free through 16 weeks were followed for up to 12-weeks off-therapy. The primary efficacy endpoint was BV recurrence, defined as 3 Amsel criteria, at or by Week 16 in the mITT population. Secondary analyses included time to recurrence, and recurrence of symptoms, individual Amsel criteria and NS 7-10.

**RESULTS:** Astodrimmer Gel was superior to placebo for the primary and most secondary efficacy measures. BV recurrence rate at or by Week 16 was 44.2% (130/294) vs 54.3% (158/291); P=.015. The time to BV recurrence, as assessed by difference in survival curves, was significantly longer for Astodrimmer Gel vs placebo; P=.007. Recurrence of BV symptoms (vaginal odor and/or discharge) at or by Week 16 was less frequent in the Astodrimmer group (27.9%; P=.002) vs placebo (40.6%). The rate of recurrence of individual Amsel criteria, except pH, was also lower in the Astodrimmer group. The recurrence of BV defined as NS 7-10 or by composite of NS