repeats within the *arp* gene and restriction fragment length polymorphism analysis of *tpr* subfamily II genes) into sequence types.

Methods *T. pallidum* PCR positive ulcer samples from 219 patients diagnosed in Denmark between 2009 and 2013 were identified for the study. At present, 16 specimens have been analysed and included in the study. Molecular typing was performed by sequence analysis of a 400-base pair region of tp0548 and will be supplemented with the CDC typing system.

Clinical data were obtained from the Danish National Syphilis Reporting System where patients diagnosed with early syphilis in Denmark are registered.

Results Sequence analysis of tp0548 revealed three sequence types designated f, g, and c, among the 16 patients. Four patients had tp0548 sequence type f. These patients were all men, and comprised both heterosexual men and MSM. One of the patients was originally from Iran. Eleven patients, including one female, had tp0548 sequence type g. These patients all reported Denmark as country of origin and the majority were habitants of Copenhagen. One patient had tp0548 sequence type c. This patient was a heterosexual man originally from Pakistan.

Conclusion These preliminary results show that a minimum of three tp0548 sequence types are prevalent in Denmark. To further differentiate between strain types, the clinical samples will be characterised using the CDC typing system. This study only included patients with lesions which limit our results to patients with early syphilis.

P1.024 *TRICHOMONAS VAGINALIS* DETECTION AND CHARACTERIZATION FROM WOMEN ATTENDING AN ANTI-RETROVIRAL CLINIC IN PRETORIA, SOUTH AFRICA

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Background Trichomoniasis caused by *Trichomonas vaginalis* affects both men and women, although the clinical presentation differs. Infected women are more likely to have symptoms compared to infected men. Approximately 75% to 100% of men are asymptomatic in comparison to approximately 50% to 75% of women who are identified as asymptomatic. In South Africa, data on the prevalence and detection of *T. vaginalis* is well-documented; however, data on the molecular characterization of *T. vaginalis* is limited. The study aimed to detect and characterise *T. vaginalis* isolates from HIV positive women attending an anti-retroviral clinic.

Methods Self-collected vaginal swabs from 380 HIV positive women were included in the study. *Trichomonas vaginalis* was detected using wet mount microscopy, culture and a commercial PCR kit. The genetic relatedness of 92 culture positive *T. vaginalis* isolates was determined. Five primers (TV1, TV2, TV3, TV5 and TV6) were used for the RAPD assay. The PCR-IGS-RFLP products were digested with five enzymes, namely: *Alu*I, *Hinf*I, *Rsa*I, *Sau*3AI and *Tsp*509.

Results A total of 8% (30/380) of specimens were positive for *T. vaginalis* using microscopy, 24% (92/380) of specimens were positive using culture and 31% (118/380) of the specimens were positive using the commercial PCR kit. RAPD assay analysis showed a high level of genetic diversity between the *T. vaginalis* isolates. The dendrogrammes obtained from the RAPD data grouped the 92 *T.vaginalis* isolates into between nine to 24 clusters with 70% similarity used to define clusters, while the PCR-IGS RFLP assay results for the isolates were genetically indistinguishable.

Conclusion The PCR assay was the most sensitive diagnostic tool for the detection of *T. vaginalis*. A high prevalence of *T. vaginalis*, consisting of different strain types, was detected in the HIV positive women included in the study.

P1.025 EFFECTS OF ABNORMAL VAGINAL FLORA AND MENOPAUSE ON CERVICOVAGINAL FLUID VISCOSITY

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Background Sexually transmitted pathogens, including HIV, are increased among women having abnormal vaginal flora. The mucus gel layer is a component of innate mucosal immunity, and the presence of mucus may contribute to the viscosity of genital tract fluid. Little is known about the impact of reproductive hormones, menopause and vaginal flora patterns on the viscosity of cervicovaginal fluid.

Methods Vaginal swabs and cervicovaginal lavage (CVL) were collected from 134 healthy asymptomatic post-menopausal women (n = 23), women in the follicular (n = 26) or proliferative (n = 19) phase, and women using levonogerestrol IUDs (n = 28), DMPA (n = 13) or combined oral contraceptives (n = 25). Vaginal smears were evaluated using the Nugent criteria. The viscosity (centipoise, cP) of each sample was measured in triplicate using a Cambridge MicroSample Viscometer. Student's t-test, analysis of variance, and linear regression were used to assess statistical significance.

Results The mean CVL viscosity among the 84 women having a Nugent score < 4 was 1.51(± 0.48) vs. 1.26(± 0.29) cP for the 50 women with abnormal vaginal flora (p = 0.001). There was no difference in CVL viscosity for women with intermediate vs. BV flora (p > 0.99). Similarly, there was no difference in viscosity among women at different phases of their menstrual cycle, nor among women using different hormonal contraceptive methods. However, the CVL of 23 postmenopausal women was less viscous compared to the 111 premenopausal women, 1.16(± 0.26) vs. 1.47(± 0.44) cP respectively (p = 0.001). In a linear regression model, abnormal flora (p = 0.01) and postmenopausal status (p = 0.005) were independently associated with decreased CVL viscosity.

Conclusion Abnormal flora and being post-menopausal are independently associated with decreased CVL viscosity. Even though phase of menstrual cycle and hormonal contraceptive use has been posited to have an impact on cervical mucus, these data suggest that these factors do not have a measurable impact of vaginal fluid viscosity.

P1.026 VALIDITY OF URINE-BASED DIAGNOSIS OF BACTERIAL VAGINOSIS

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Background Current gold standard diagnosis of bacterial vaginosis (BV) relies on categorising Gram-stained vaginal smears through Nugent scoring. We have recently described an alternative method of diagnosis, based on visualisation through fluorescence-in-situ-hybridisation (FISH) of the BV biofilm on desquamated vaginal epithelial cells present in urine sediments.

Methods A vaginal swab and a first void urine specimen were obtained from 72 pregnant women attending the antenatal clinic. The vaginal swab was used to assess the vaginal microbiota status through Nugent scoring. The urine specimen served for FISH-based diagnosis of the Gardnerella dominated polymicrobial adherent biofilms attached to desquamated vaginal epithelial cells.

Results Among the 12 women with BV on urine assessment, 10 had BV according to Nugent's score and 2 had intermediate microbiota. Presence of Gardnerella in a planktonic mode of growth occurred with 8 women and all have Nugent scores ≤3. Among the 52 women in which no Gardnerella could be documented through FISH, 2 had a Nugent score of ≥ 7, 2 a Nugent score of 4 to 6, and the remainder a Nugent score of ≤ 3. Accordingly, when comparing

the FISH based analysis to Nugent scoring, it may be inferred that FISH based analysis has an accuracy for the diagnosis of BV of 0.94 [95% CI 0.86 – 0.98] (sensitivity 0.83 [95% CI 0.51 – 0.97], specificity 0.97 [95% CI 0.87 – 0.99], PPV 0.83 [95% CI 0.51 – 0.97], and NPV 0.97 [95% CI 0.87 – 0.99].

Conclusion Urine-based diagnosis of bacterial vaginosis has a high accuracy. This method is particularly suited for epidemiological and clinical studies as fixated urine sediments can be stored for prolonged periods of time and the aliquots can be used for repeated FISH hybridisations under standardised conditions. In addition, urine samples are easily obtained in a non-invasive manner.

P1.027 RISKS ASSOCIATED WITH BACTERIAL VAGINOSIS IN INFERTILITY PATIENTS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Background Several studies have shown that bacterial vaginosis (BV) is particularly prevalent in patients with infertility, though it has not been firmly established which risks infertility patients with BV incur for pregnancy outcome. We aimed to assess the prevalence of BV in infertility patients, as well as to quantify the magnitude of the association between BV and cause of infertility on the one hand, and conception rates and early pregnancy loss following in-vitro-fertilisation (IVF) on the other hand.

Methods Systematic literature review and meta-analysis.

Results The estimated prevalence of BV in infertile women is 19% (95% CI: 14 – 25%). Abnormal microbiota (Nugent scores 4 to 10) occurs in 39% of the infertile patients (95% CI: 26 – 52%). BV is significantly more prevalent in women with infertility compared to antenatal women in the same population (OR 3.32, 95% CI 1.53 – 7.20). BV is significantly more prevalent in women with tubal infertility compared to women with other causes of infertility (OR 2.77, 95% CI 1.62 – 4.75). BV is not associated with decreased conception rates (OR 1.03, 95% CI 0.79 – 1.33). BV is associated with a significantly elevated risk of preclinical pregnancy loss (OR 2.36, 95% CI: 1.24 – 4.51), but is not associated with an increased risk of first trimester abortion (OR 1.20, 95% CI: 0.52 – 2.74)

Conclusion All studies on cause of infertility in relation to BV included had a cross-sectional design and therefore do not allow for causal inferences. Still, there is strong circumstantial evidence that supports a causal link between BV and tubal infertility. Studies with a longitudinal design on other hand strongly support a relation between BV and early pregnancy loss. Unfortunately, no study looked beyond first trimester foetal loss.

P1.028 TREATMENT OF RECURRENT BACTERIAL VAGINOSIS WITH OCTENIDINE DIHYDROCHLORIDE

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Background Bacterial vaginosis is a recalcitrant polymicrobial biofilm infection that often resists standard antibiotic treatment. We therefore considered repeated treatment with octenidine, a local antiseptic that has previously been shown to be highly effective in several biofilm-associated infections.

Methods Twenty-four patients with recurrent BV were treated with a 7-day course of octenidine (octenidine dihydrochloride spray application with the commercial product Octenisept®). In case of treatment failure or relapse within six months patients where re-treated with a 28 day course of octenidine. In case of recurrence within six months after the second treatment course, patients were treated again with a 28 day course followed by weekly applications for two months. Treatment effect was evaluated by assessment of the presence of the biofilm on voided vaginal epithelial cells through fluorescence-in-situ-hybridisation (FISH).

Results The initial cure rate following a 7-day course of octenidine was as high as 87.5%. The six-month relapse rate was however as high as 66.6%. Repeated treatment for 28 days led to an overall cure rate of 75.0%, however was also associated with emergence of complete resistance to octenidine in a subset of women. The overall cure rate after three treatment courses with one year follow-up was 62.5%, with 37.5% of the patients showing complete resistance to octenidine.

Conclusion Although octenidine dihydrochloride was initially highly effective, it was also found that the efficacy of repeated and prolonged treatment dropped quickly as challenge with the antiseptic rapidly led to bacterial resistance in a considerable subset of women.

P1.029 BACTERIAL VAGINOSIS ASSOCIATED BACTERIA ARE DETECTED TOGETHER WITH UREAPLASMAS IN MEN BUT NOT ASSOCIATED WITH NON-GONOCOCCAL URETHRITIS

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Background Little is known about the presence of bacterial vaginosis (BV) associated bacteria in men, but male partners of women with BV have been reported to have a high risk of urethritis. We aimed to examine the role of BV associated bacteria in urine specimens from men with and without non-gonococcal urethritis (NGU).

Methods First-pass urines were collected from 44 men with symptomatic NGU (≥ 5 PMNL/hpf) and 97 asymptomatic men without NGU (< 5 PMNL/hpf). Samples were tested for *Chlamydia trachomatis* (Ct), *Mycoplasma genitalium* (Mg), *Ureaplasma urealyticum (*Uu), *U. parvum* (Up), HSV 1 and 2, and adenovirus by PCR.

Quantitative PCRs were performed to detect *Gardnerella vaginalis*, *BVAB 2, Eggerthella*-like uncultured bacterium, *Megasphaera* type 1*, Leptotrichia amnionii*, *Atopobium vaginae*, *Sneathia sanguinegens*, and *Prevotella* sp.

Results Ct was detected in 9 (21%) cases with NGU and 1 (1%) control without NGU. Mg was detected in 10 cases (23%) and none of the controls. Corresponding figures were for Uu 4 (9%) and 26 (27%), and Up in 6 (14%) and 25 (26%), respectively. HSV type 1 was found in 2 case samples (5%). Controls were all negative for HSV. Adenovirus was found in 2 NGU samples and none of the controls. In 20 (46%) NGU cases no aetiology was found.

Conclusion *G. vaginalis*, BVAB-2, *Eggerthella*, *L. amnionii*, *A. vaginae*, *S. sanguinegens* and *Prevotella,* but not *Megasphaera* type 1, had an increasing bacterial load with increasing total *Ureaplasma* sp. load in male urine regardless of NGU status or co-infections with known NGU pathogens. None of the BV bacteria were associated with NGU.

Correlation between total *Ureaplasma* sp. and BV bacterial load in all samples:

Abstract P1.029 Table

BV bacteria	Spearman-Correlation	p-value
G. vaginalis	0.59	< 0.0001
BVAB-2	0.28	0.0008
Eggerthella	0.49	< 0.0001
Megasphaera	-0.05	0.57
L. amnionii	0.31	0.0003
A. vaginae	0.36	< 0.0001
S. sanguinegens	0.27	< 0.0001
Prevotella sp.	0.14	0.0003