LACTIC ACID ISOMERS DIFFERENTIALLY REDUCE CHLAMYDIA TRACHOMATIS INFECTION IN A pH DEPENDENT MANNER

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Introduction Epidemiological studies indicate that the vaginal microbiota can significantly impact the risk of acquiring sexually transmitted infections, including chlamydia. Lactobacillus spp. are the most common commensal bacteria in the healthy human vagina; they produce lactic acid to create an acidic environment with pH ranging between 3.5 and 4, thought to reduce vaginal colonisation by STI agents. However, not all species of Lactobacillus are believed to perform this function equally, and we hypothesised that species that produce low amounts or no D-lactic acid, while achieving low pH do not fully protect women.

Methods A 3D model of cervical epithelial cells (A2EN) developed in our lab was exposed to D(-), L(+) or a D/L racemic mixture of lactic acid at various concentrations to produce pH 7, 5.5 and 4 or to several Lactobacillus spp. conditioned media (LCM). Cells were infected with C. trachomatis serovar L2 for 48 h, stained and imaged by confocal microscopy. Analysis of the resultant IFUs was used to determine the number of infected host cells.

Results We observed a reduction of Chlamydia trachomatis infectivity in a pH dependent manner. Further, at pH 4, D(-) lactic acid afforded maximal protection compared to L(+) lactic acid. Interestingly, 50% infectivity is still observed with HCL at pH 4, indicating that pH alone is not responsible for this protection. Exposure of cells to conditioned media from the various Lactobacillus spp. showed that high D(-) lactic acid producing bacteria (Lactobacillus crispatus and Lactobacillus jensenii) afforded significantly greater protection against C. trachomatis than did Lactobacillus iners, which produces predominantly L (+) lactic acid.

Conclusion These results suggest a differential role for specific species of Lactobacillus in driving resistance to C. trachomatis infections and potentially other STIs. Lactic acid isomers production should be considered when developing vaginal probiotics.

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EXPANDING THE MACAQUE MODEL OF TRICHOMONAS VAGINALIS INFECTION

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Introduction The pigtailed macaque model for trichomonal infection was used to compare T. vaginalis (TV) detection technologies, to describe infection status in younger versus older populations, and to test whether TV reinfection after antibiotic clearance is possible in this model.

Methods Thirty-six macaques received a single vaginal TV inoculation (ATCC 50148; ~6E5), followed by five weekly visits to document infection. Eighteen animals were 4–7 years old; eighteen were over 13 years old. Infection status was documented by culture (InPouchTV) and by NAAT (AptimaTV). Colposcopy was performed to assess tissue reaction to infection. Animals underwent antibiotic treatment (metronidazole) and test-of-cure. Five macaques from the younger cohort were later re-inoculated with the same TV strain and followed for three weeks to document reinfection.

Results All but one (older) animal were successfully infected after the initial vaginal challenge. Among 295 matched samples (culture/NAAT), 22 did not share confirmatory results. In this experimental setting, with weekly vaginal swabs providing a timeline of trichomonal presence in each animal, we can infer
infectious status for some discrepant samples. It is likely that 10–12 instances can be attributed to false culture readings, and 3–5 to false NAAT results. Self-limited infections were noted more frequently among younger macaques. Fruible tissue was noted more frequently among older animals. Four of the five animals that were re-challenged with TV developed infection.

Conclusions The NAAT gave fewer false results, when we had the luxury of a timeline of serial samples to refer to for determining test accuracy. Similar infection rates were observed in both age cohorts. Older animals had a greater incidence of cervicovaginal irritation evidenced primarily by friability in this study, and younger animals tended to self-clear T. vaginalis infection faster than older animals. Finally, TV re-infection is possible in the macaque model.

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POB.10 CHLAMYDIA TRACHOMATIS INFECTION IN SAMOAN WOMEN: PREVALENCE AND RISK FACTORS

Introduction Knowledge about genital Chlamydia trachomatis (CT) infection in the Pacific is limited to studies of antenatal women. We approached studying CT infection in Samoan women by using a maternal and family health focus, investigating both CT and infertility amongst women exposed to pregnancy risk.

Methods Women having unprotected intercourse aged 18–29 years were recruited from 41 Samoan villages. They were answered a behavioural questionnaire and provided a urine sample for CT testing by nucleic acid amplification. Associations between CT infection and possible risk factors were explored using logistic regression.

Results 239 women were recruited; 86 (36.0%; weighted estimate: 41.9%; 95% CI: 33.4–50.5%) were positive for CT infection. Being single (OR 1.92; 95% CI, 1.02–3.63) and having two or more lifetime sexual partners (OR 3.02; 95% CI, 1.19–7.67) were both associated with CT infection. However, a very high prevalence was still seen in those reporting only one lifetime partner (27.6%). Participants who had a previous pregnancy were less likely to be positive (OR 0.49; 95% CI, 0.27–0.87). Although a slightly higher proportion of women aged 18–24 were positive than those aged 25–29, age was not significantly associated with infection.

Conclusion Whilst this sample may be considered high risk, use of barrier protection in Samoa has previously been found to be extremely uncommon and women had reported relatively few partners within the current study. Therefore, this study confirms findings from World Health Organization antenatal surveys: the prevalence of CT infection in Samoan women is likely to be very high. Studies with further assessment of the impact of CT on pelvic inflammatory disease and infertility, studies including men and strategies for sustainable control are needed.

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POB.11 CHLAMYDIA TRACHOMATIS INCIDENCE FROM SELF-REPORTS AND SEROLOGY BY AGE-PERIOD, SEX AND PARTNER NUMBERS IN A BIRTH COHORT

Background Better understanding of the epidemiology of Chlamydia trachomatis (CT) would assist in prevention and control,