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O-303 Recurrent pregnancy loss is associated with unfavorable composition of endometrial and vaginal microbiota

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Study question: Does endometrial or vaginal microbiota composition associate with recurrent pregnancy loss (RPL)?

Summary answer: Reduced relative abundance of Lactobacillus crispatus in endometrium and increased relative abundance of Gardnerella vaginalis in endometrium and vagina were associated with RPL.

What is known already: Dysbiotic vaginal microbiota associates with sporadic miscarriage and the depletion of lactobacilli in the endometrium has been associated with poor IVF outcomes, but their association with RPL has not been studied.

Study design, size, duration: A nested case-control study of 47 women investigated for RPL and 39 healthy control women without a history of pregnancy loss were recruited between March 2018 and December 2020 at a university hospital. Endometrial biopsies and vaginal samples were collected from the women 6-8 days after positive ovulation test result.

Participants/materials, setting, methods: The endometrial and vaginal microbiota compositions, analysed using 16S rRNA gene amplicon sequencing, were compared between RPL women and controls, and between individual vaginal and endometrial samples. The mycobiota composition was analysed using internal transcribed spacer I amplicon sequencing for a descriptive summary. The models were adjusted for BMI, age, and parity. False discovery rate-corrected P-values (q-values) were used to define nominal statistical significance at q < 0.05.

Main results and the role of chance: Lactobacillus crispatus was less abundant in the RPL women’s endometrial samples compared to controls (mean relative abundance 17.2% vs. 45.6%, q = 0.04). Gardnerella vaginalis was more abundant in RPL women than in controls in both endometrial (12.4% vs. 5.8%, q < 0.001) and vaginal samples (8.7% vs. 5.7%, q < 0.01). The individual vaginal and endometrial microbial compositions correlated strongly (R = 0.85, P < 0.001). Fungi, mostly Candida albicans, were detected in 22% of the endometrial and 36% of the vaginal samples.

Limitations, reasons for caution: Limitations include the transcervical sampling technique with a potential risk of cervicovaginal contamination of endometrial samples, the loss of a proportion of the samples from statistical analyses due to their low read count, and the presentation of the 16S rRNA sequencing results in relative rather than absolute abundances.

Wider implications of the findings: Our findings suggest that an unfavorable endometrial microbiota may be a novel risk factor for RPL. Further studies should elucidate the mechanisms, how microbiota may predispose to RPL, possibilities to modify microbiota by treatments, and the effects of such treatments on the success of future pregnancies in couples having RPL.

Trial registration number: not applicable