High prevalence of *Lactobacillis crispatus* among adolescent girls attending secondary school in Tanzania

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Introduction

Bacterial vaginosis (BV) is characterized as a reduction of vaginal lactobacilli and an overgrowth of other (facultative) anaerobic bacteria. BV has been associated with preterm delivery, pelvic inflammatory disease, and sexually transmitted infections. Furthermore, BV increases viral replication and vaginal shedding of HIV-1 and HSV-2.

Lactobacilus crispatus has been shown to be associated with the absence of BV, and might be less common in women of African descent.[1] A study among different populations of women in East and Southern Africa has shown a relatively low prevalence of *L. crispatus* (17-38%).[2] The aim of this study was to characterize the vaginal microbiota of adolescent girls in Tanzania around the time of their sexual debut.

Methods

Girls aged 17-18 years old attending secondary schools in Mwanza City were invited to join a cross-sectional study. After informed consent/assent, girls were interviewed and self-collected vaginal swabs were obtained and tested for the following species by in-house quantitative PCR: *Lactobacillus crispatus, L. iners, L. gasseri, L. jensenii, L. vaginalis, Atopobium vaginae*, and *Gardnerella vaginalis*. Differences in the prevalence of bacterial species were analysed using logistic regression. Mean log concentrations were calculated for each species. All cell concentrations were measured in mL and log10 transformed before entering the analysis. To handle zero values, a single unit (i.e. 1 cell/mL) was added to all concentrations before log transformation.

Results

Of the 403 girls enrolled, 386 provided samples for this analysis; 163 (42%) reported having ever had penile-vaginal sex. No girls reported smoking; few girls reported intravaginal cleansing (15%), and very few girls reported receptive oral sex (2%). Of the girls who reported penile vaginal sex, 25% reported having more than one partner.

The overall prevalence of each species was as follows: *L. crispatus*, 75%; *L. iners*, 83%; *L. gasseri*, 22%; *L. jensenii*, 49%; *L. vaginalis*, 66%; *A. vaginae*, 44%; and *G. vaginalis*, 62%. Prevalences of each species by sexual debut status are shown in the Table. Prevalences of *A. vaginae* and *G. vaginalis* were higher among girls who reported penile-vaginal sex, while prevalences of *L. crispatus*, *L. jensenii,* and *L. vaginalis* were lower in girls reporting penile-vaginal sex.

	Girls who deny penile-vaginal sex (N=223)	Girls who report penile-vaginal sex (N=163)	Odds ratio (95% CI)	P-value
L. crispatus	168 (75%)	98 (60%)	0.49 (0.32 to 0.76)	0.002
L. jensenii	123 (55%)	65 (40%)	0.54 (0.36 to 0.81)	0.003
L. gasseri	51 (23%)	34 (21%)	0.89 (0.54 to 1.45)	0.638
L. vaginalis	166 (74%)	89 (55%)	0.41 (0.27 to 0.64)	<0.001
L. iners	179 (80%)	139 (85%)	1.42 (0.83 to 2.45)	0.204
A. vaginae	76 (34%)	92 (56%)	2.51 (1.65 to 3.80)	<0.001
G. vaginalis	116 (52%)	123 (75%)	2.84 (1.82 to 4.42)	<0.001

Table Proportion of 386 girls with bacterial species presence by sexual debut status

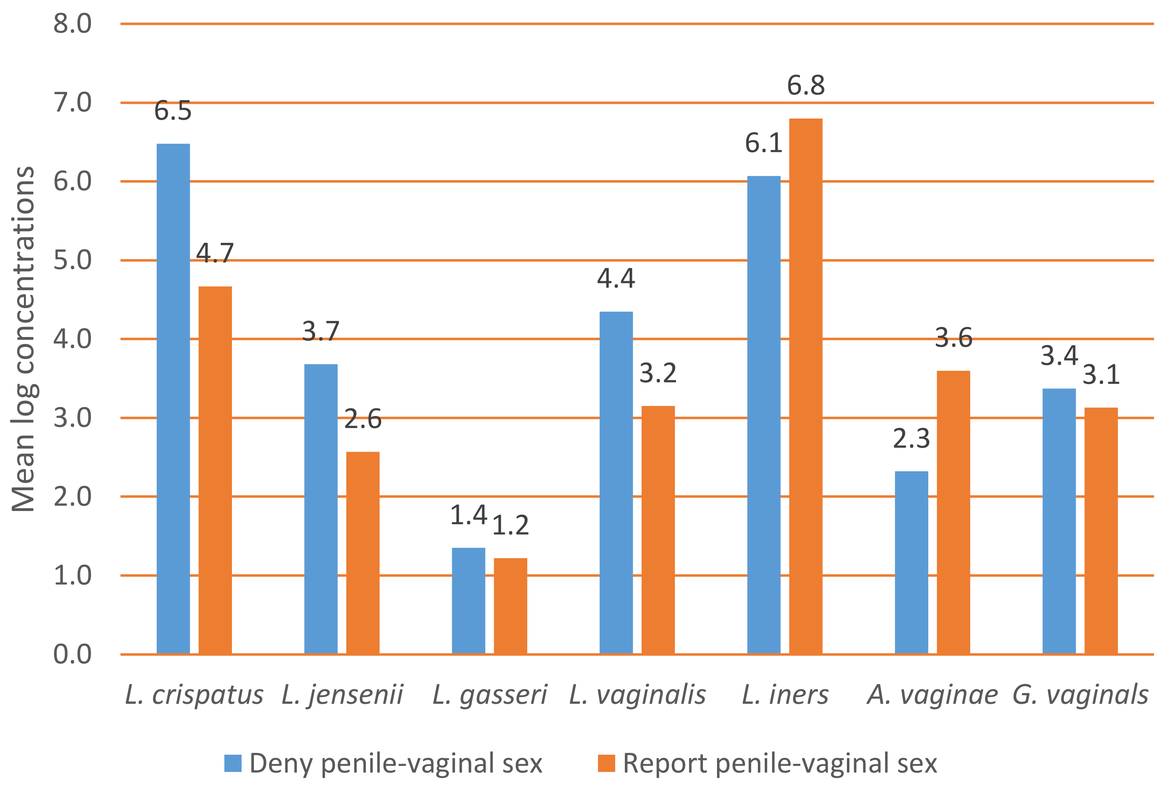

Figure Mean log concentrations for 386 girls by species

There were high concentrations (>10^6 genome equivalents [geq]/ml) of *L. crispatus* among girls who denied penile-vaginal sex, and of *L. iners* among both girls who reported or denied penile-vaginal sex (Figure). There were relatively low concentrations (10^3 to 10^6 geq/ml) of *L. gasseri, L. jensenii*, *L. vaginalis*, *A. vaginae* and *G. vaginalis*.

Conclusions

Among girls attending secondary school in Tanzania, sexual debut was associated with quantifiable changes in vaginal microbiota. BV-associated bacteria were present in many girls before reported penile-vaginal sex. Additionally, the prevalence of *L. crispatus* was higher than what had been reported in previous studies among women in East and Southern Africa.

More research on the vaginal microbiota (cross-sectional as well as longitudinal) among young women of different ethnicity is needed to explore the role of the vaginal microbiota in transmission of HIV and other STIs.

References

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