

Presenting Author Name

Kelvin Joseph

Phonetic spelling of your (full) name

Kelvin Jo-SEF

Presenting Author Category

Non-Trainee

Supervisor Name

Alicia Berard

GBD Audio File

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Headshot

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Short Bio (100 words)

Kelvin Joseph is a Research Technician 2 at the Department of Obstetrics, Gynecology and Reproductive Sciences. He holds a BSc Honours Co-op in Biological Sciences and has research experience in cardiophysiology, agricultural biotechnology, and reproductive health. His current research focuses on the vaginal microbiome, Gardnerella vaginalis biofilms, and strategies to improve women’s reproductive health. His previous work explored species-specific RNA interference pesticides targeting agricultural pests. Kelvin is interested in interdisciplinary research, scientific innovation, and translating discoveries into meaningful improvements in human health and food security.

Research Category

Basic Science

Abstract Title

The effects of Boric Acid on Gardnerella vaginalis as a treatment for Bacterial Vaginosis

Authors

Name	Role	Profession
Kelvin Joseph	Presenting Author	Technician
Debjyoti Thakur	Co Author	Graduate
Maria Garcia	Co Author	Graduate
Carmine Slipski	Co Author	Post-Doctorate

Denise Bay	Co Author	Acting Department Head and Associate Professor
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Alicia Berard	Principle Investigator	Assistant Professor
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Background

\$4.8 billion is spent annually to treat bacterial vaginosis (BV), which is a highly prevalent lower genital tract condition in females of reproductive age that is associated with poor reproductive health outcomes such as preterm birth and stillbirth, with treatment often resulting in recurrence within a year. BV is characterized by a loss of a Lactobacillus-dominant microbiome and an overgrowth of anaerobes such as Gardnerella vaginalis, which form biofilms restricting treatment efficacy through a physical barrier. Lactobacillus crispatus is associated with a protective vaginal microbiome, whereas Lactobacillus iners has both protective and potentially disruptive properties. Boric acid is used to treat recurrent BV and may disrupt biofilms, but its mechanism remains unclear. .

Objective

We aim to characterize how boric acid acts against different vaginal bacteria to better understand its clinical efficacy

Methods

We will use minimum inhibitory concentration (MIC) assays to determine the most effective concentration of boric acid against both type and clinical strains of Lactobacillus and Gardnerella bacteria isolated from the local THRIVE BV cohort. We will investigate biofilm formation of Gardnerella to see if boric acid can inhibit biofilm growth or disrupt mature biofilms. We used unpaired t-tests to determine statistical differences between treatments and concentrations.

Results

The MIC of Boric acid for the type strain Gardnerella was 1.22 ± 0.19 mg/mL and Lactobacillus iners was 4 ± 0.0 mg/mL, while Lactobacillus crispatus was 5 ± 0.0 mg/mL for $n=3$ for each. Ongoing experiments are investigating the MICs for clinical isolates. Our optimization on Gardnerella biofilm formation identified best growth conditions using MBEC plates with NYCII media.

Conclusion

The MIC for boric acid for Gardnerella was significantly lower than that of both Lactobacillus species ($p < 0.001$), indicating that boric acid may inhibit Gardnerella growth while not affecting Lactobacilli strains at optimal local concentrations. These results will clarify the best practices for using boric acid in the clinic to treat bacterial vaginosis.