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Main features of lactobacilli for the design of beneficial-probiotic vaginal formulations

Fátima Nader-Macías
CERELA-CONICET, Argentina

Statement of the Problem: Women are frequently affected by urogenital infections (UGTI) originating risks for them, and to newborns during pregnancy or at delivery. Lactobacilli are the main components of the urogenital microbiota of healthy women decreasing at infectious states. Probiotic formulas are been used to restore the ecological balance and to prevent UGT infections. Lactobacilli included in vaginal probiotic formulations must be characterized by applying different type of techniques, to determine their “beneficial” or “probiotic” properties, indicated in the Figure. The purpose of this work is to summarize the experience of selecting vaginal lactobacilli for the design of locally applied formulations.

Methodology & Theoretical Orientation: Vaginal Lactobacillus strains were isolated from healthy women, identified by phenotypic and genetic assays, and selected by applying the following techniques: a) Beneficial properties: Surface-related (hydrophobicity, auto and co-aggregation, biofilm formation), production of inhibitory metabolites (hydrogen peroxide, bacteriocins, or organic acids), b) Functional properties: Resistance to the vaginal tract, and frequent therapies, c) Safety: Antibiotic sensitivity and expression of virulence factors, d) Technological performance: High biomass in low-cost culture media, compatibility with excipients, viability during storage, resistance to freeze-drying e) Mechanisms of action: In animal models, evaluating the adverse effects due to no production, and later Phase I assays.

Findings: Different Lactobacillus strains were selected by applying the criteria cited before, and included in soft capsules for vaginal formulations. Further clinical trials are required to determine the specific infections that the formulas prevent are, by the restoration of the ecological balance of the vaginal tract, and by stimulation of the immune system.

Conclusion & Significance: Women with UGTI, and in pregnancy needs a stable urogenital tract microbiota dominated by lactobacilli, sustained by the use of probiotic formulations applied locally, containing well characterized live bacteria, in high numbers, isolated from the human host and tract, to promote their permanence in the tract.

fatynader@gmail.com

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