

# 4P MEDICINE AND OBSTETRICAL TRAUMA: NEW APPROACH



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## Introduction

- During the last decade, there has been an increase in the frequency of perineal injuries during childbirth [1].
- Recent studies show a link between microbiome alterations and complications [2].
- Impact of microbiome imbalance: Can lead to inflammatory processes affecting pregnancy.
- Solution to obstetrical trauma: Correcting vaginal dysbiosis using 4P medicine principles (prevention, prediction, personalized, precise, and patient-oriented treatment) with individually selected biopreparations.

## Objectives

- Study aim: Evaluate therapeutic effect of personalized predictive correction of vaginal microbiota.
- Method: Individual selection and prescription of pharmabiotics (*L. plantarum* A, *L. bulgaricus* A6, *L. bulgaricus* A22, *L. bulgaricus* S6, *L. bulgaricus* S19, and *L. rhamnosus* S25) with proven clinical efficacy
- Goals:
  - Prevent and reduce in-labor birth canal trauma.
  - Improve the postpartum period course.

## Materials and Methods

- Participants: 12 third-trimester pregnant women and 12 control group women of the same age from Odessa City Maternity Hospital № 5.
- Analysis: Vaginal delivery in occipital presentation and postpartum period during 2022–2023.
- Microbiota assessment: Bacteriological analysis using selective media and identification with MIKRO-LA-TEST produced by PLIVA-LACHEMA (Brno, Czech Republic); genetic research using PCR (Femoflor-16 kit) and NGS methods [3].
- Correction method: the author's strains of pharmabiotics of variable composition BioMECombi were used (Technical Specification TU U 10.8-41253026-001:2021 Dietary Supplements 'BioMe COMBI 10+1' TM 'EDIENS'), the method and selection of which are the subject of a patent [4].
- Effectiveness: Pharmabiotics effective if they showed antagonistic activity against pathogenic microorganisms without affecting commensal microbiota growth.

## Results

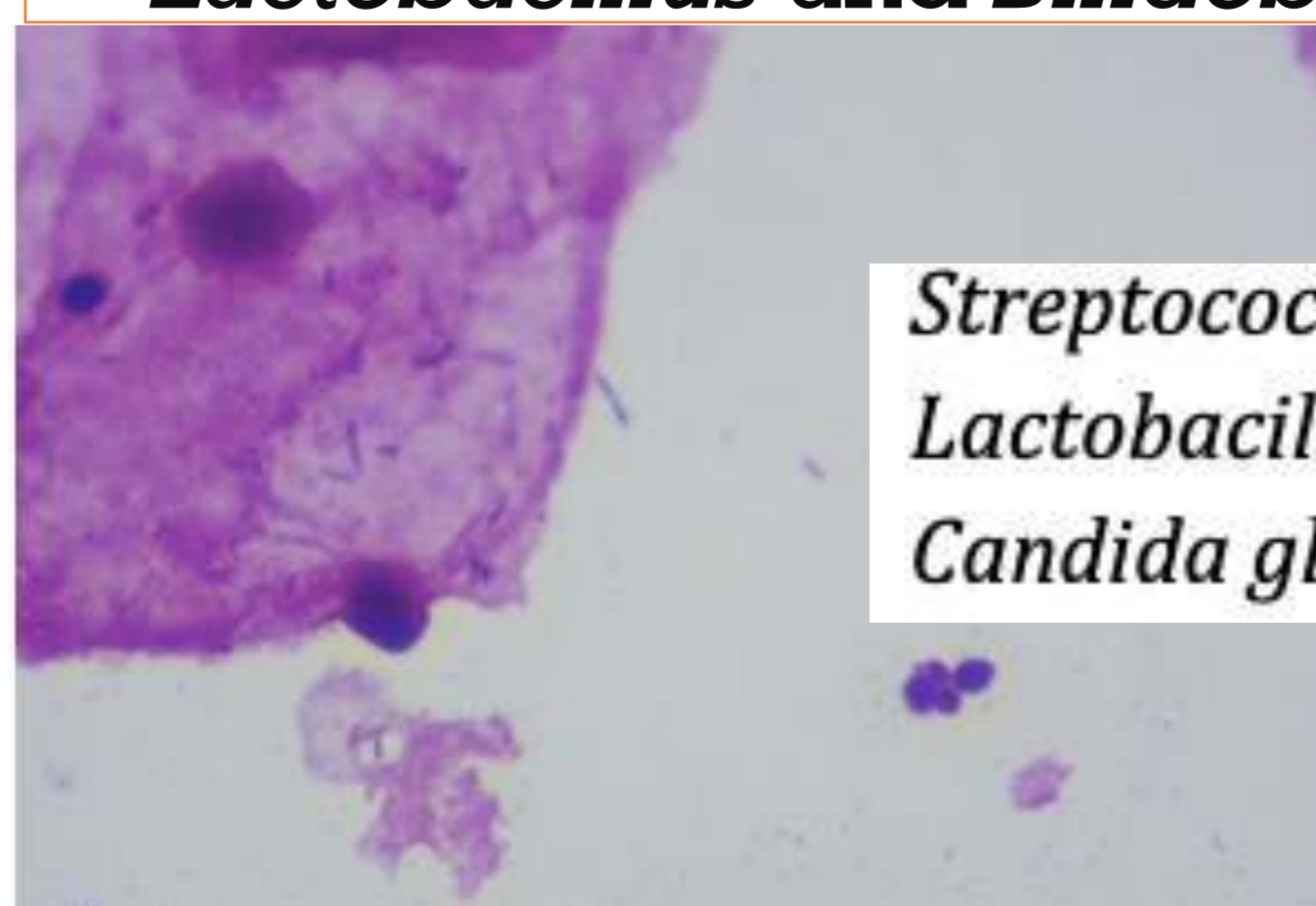
- Dysbiosis was mainly due to elevated levels of pathogenic bacteria (*S. epidermidis*, *S. agalactiae*, *G. vaginalis*, *E. coli*) and *Candida* fungi (*C. albicans*, *C. guilliermondii*).
- Reduced concentrations of *Lactobacillus* spp. and partial absence of *Bifidobacterium* spp.

Correction of vaginal microbiota with individually selected pharmabiotics led to:

- Reduced duration of the second stage of labor compared to the control group.
- Lower frequency of episiotomy (1.63 times lower).
- Decreased rate of soft tissue injuries during childbirth (1.32 times lower).
- Significant reduction in discomfort in the vagina and perineum during the postpartum period (2.49 times less).
- Less pain syndrome experienced (1.85 times less).
- Overall clinical improvement in quality of life and vaginal secretion pH normalization.
- *L. bulgaricus* S19 and *L. rhamnosus* S25 were found to be the most effective strains, inhibiting pathogenic microorganisms and promoting growth of beneficial *Lactobacillus* and *Bifidobacterium* species.

	The name of the microorganism	Concentration, CFU/ml	Reference range CFU/ml
1	<i>Escherichia coli</i> ENTEROTest16*	10 <sup>9</sup>	<10 <sup>4</sup>
2	<i>Candida albicans</i> CandidaScreen*	10 <sup>9</sup>	<10 <sup>4</sup>
3	<i>Lactobacillus crispatus</i> ANAEROTest23*	10 <sup>4</sup>	10 <sup>6</sup> – 10 <sup>9</sup>

Pharmabiotics	<i>Escherichia coli</i>	<i>Candida albicans</i>	<i>Lactobacillus crispatus</i>	Results of microbiological examination of vaginal discharge and personalized selection of pharmabiotics for the correction and restoration of vaginal microbiota
1 <i>L. plantarum</i> A	Inhibits	Doesn't inhibit	Doesn't inhibit	
2 <i>L. bulgaricus</i> A6	Inhibits	Doesn't inhibit	Doesn't inhibit	
3 <i>L. bulgaricus</i> A22	Doesn't inhibit	Inhibits	Doesn't inhibit	
4 <i>L. bulgaricus</i> S6	Doesn't inhibit	Doesn't inhibit	Inhibits	
5 <i>L. bulgaricus</i> S19	Inhibits	Inhibits	Doesn't inhibit	
6 <i>L. rhamnosus</i> S25	Inhibits	Inhibits	Doesn't inhibit	



*Streptococcus* spp. sp. B  
*Lactobacillus acidophilus*  
*Candida glabrata*



Pharmabiotics

## Conclusions

1. Personalized Correction of Vaginal Microbiome: Utilizing 4P medicine principles offers effective labor birth canal trauma prevention and postpartum course enhancement.
2. Predictable Microbiome Correction: 4P medicine methods ensure precise correction using pharmabiotics, exemplifying patient-oriented biopreparation use in medicine.
3. Evidence-Based Practice: The approach underscores the need for substantial quantitative and qualitative research for comprehensive evaluation.

## References

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