



Effects of reproductive tract microbiota during the success of in vitro fertilization and embryo transfer

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Abstract

Introduction: Infertility affects one in six people worldwide, yet in vitro fertilization and embryo transfer (IVF-ET) result in live births in only 30–35% of cases. A vaginal and endometrial microbiota dominated by *Lactobacillus* species has been linked to improved IVF-ET outcomes, while bacterial imbalances (dysbiosis), involving *Gardnerella vaginalis* and *Prevotella bivia*, are associated with implantation failure. However, the precise role of reproductive tract microbiota in IVF-ET success remains unclear.

Methods: A literature review was conducted to assess the influence of the uterine and vaginal microbiome on IVF-ET outcomes. Studies were identified through PubMed and Google Scholar using terms such as "infertility," "microbiome," "dysbiosis," and "microbiota." Cohort studies and randomized controlled trials were included.

Results: Patients with a *Lactobacillus*-dominant microbiota had significantly higher implantation (60.7% vs. 23.1%, $p=0.02$), pregnancy (70.6% vs. 33.3%, $p=0.03$), and live birth rates (58.8% vs. 6.7%, $p=0.002$). Miscarriage rates were higher in those with a non-*Lactobacillus*-dominant microbiota (60% vs. 16.7%, $p=0.07$). Pregnant women had lower *G. vaginalis* levels (12.5%) and higher *Lactobacillus crispatus* abundance (23.97% vs. 16.91%, $p=0.183$), while *Lactobacillus iners* was more prevalent in non-pregnant women (27.75% vs. 21.90%, $p=0.069$), though not statistically significant.

Discussion: A *Lactobacillus*-rich microbiota, particularly *L. crispatus*, supports successful IVF-ET outcomes, whereas *G. vaginalis* and *Streptococcus* species are linked to implantation failure. Further research is needed to refine microbiome-targeted strategies for improving fertility treatment success.

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Cite as: T Rahman, D Gujarathi, S Suryawanshi, & P Ghag. Effects of reproductive tract microbiota during the success of in vitro fertilisation and embryo transfer. *Impact Surgery*, 2(3), 105. <https://doi.org/10.62463/surgery.169>