

Does Administration of Probiotics to Women Aiming to Get Pregnant

Reduce the Risk of Pregnancy Complications?

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Abstract

This paper aims to assess the role of the vaginal and uterine microbiota in pregnancy complications, specifically miscarriages. With 1% of women experiencing recurrent miscarriages, the need to further research risk factors for miscarriages is evident. The findings of this research revealed there may be a place for probiotics in the prevention of pregnancy complications. Studies have shown that there is an impact of various bacteria within the uterine and vaginal microbiota on conceiving and maintaining healthy, full-term pregnancies. Considering these findings, it is recommended that healthcare providers consider recommending probiotic supplements to anyone aiming to conceive, especially those who have suffered recurrent miscarriages.

Introduction

Miscarriages are the most commonly occurring complication of pregnancy. About 25-50% of women experience at least one miscarriage, and 1% of women experience recurrent miscarriages. Miscarriages are most commonly caused by genetic abnormalities, but can also be caused by structural abnormalities, infection, endocrine abnormalities, or immune dysfunction¹. However, the cause of most recurrent miscarriages is **unknown**². Research has shown that there is a relationship between the vaginal and uterine microbiota and pregnancy complications^{4,5}.

Learning Objectives:

- Better understand the known causes of miscarriages and recurrent miscarriages
- Gain insight into the role that the vaginal and uterine microbiota plays in pregnancy complications
- Discuss typical bacteria found within the vaginal and uterine microbiota
- Discuss approaches to improving pregnancy outcomes related to potential abnormalities in vaginal or uterine microbiota
- Understand the role providers can play in promoting a healthy microbiome and attempt to improve pregnancy outcomes

Methods

A literature search was performed through Academic Search Ultimate, Google Scholar, and PubMed. Fourteen articles were selected based on relevance to the research question.

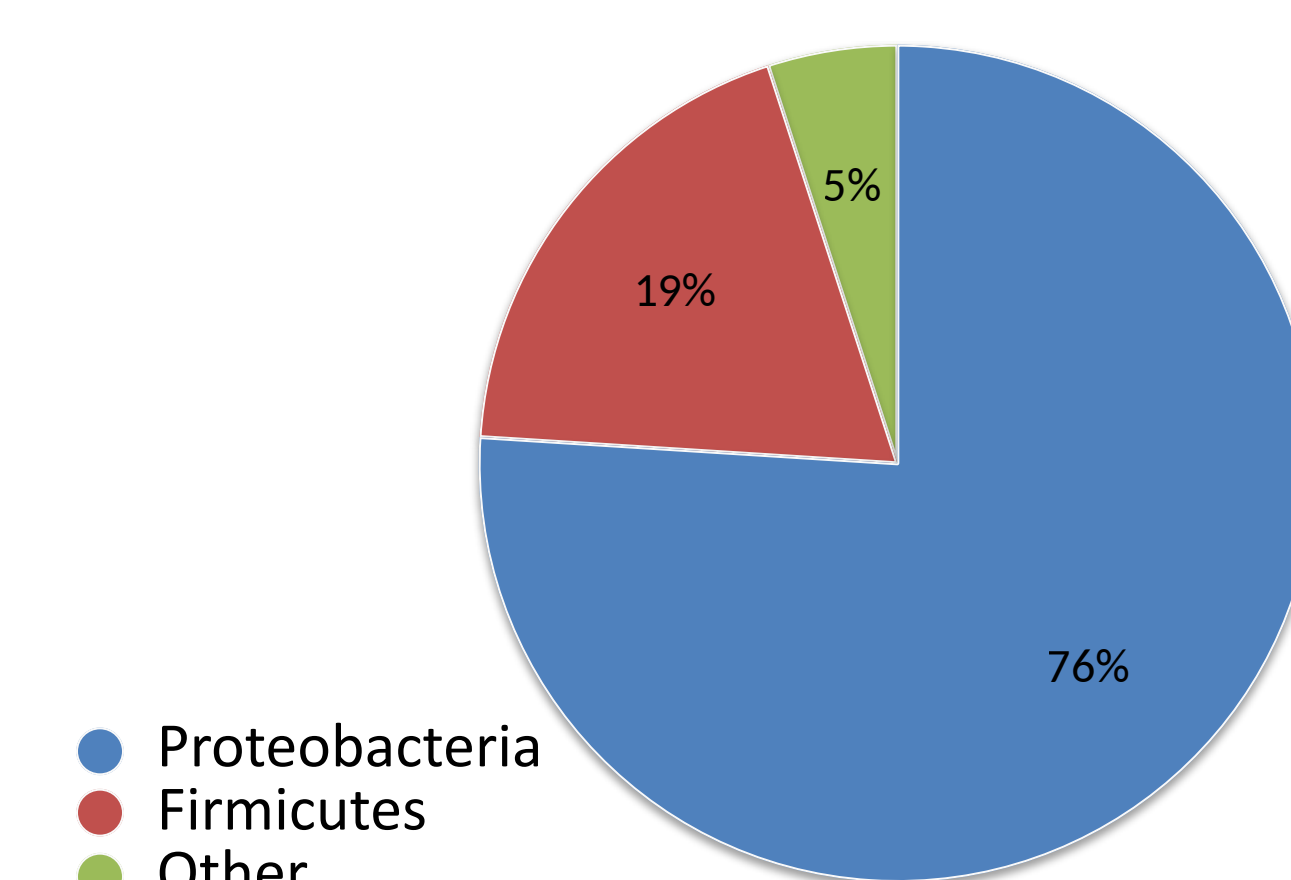
Search Terms:

“pregnancy OR conception AND probiotics OR microbiota OR bacteria AND miscarriages OR spontaneous abortion OR complications”

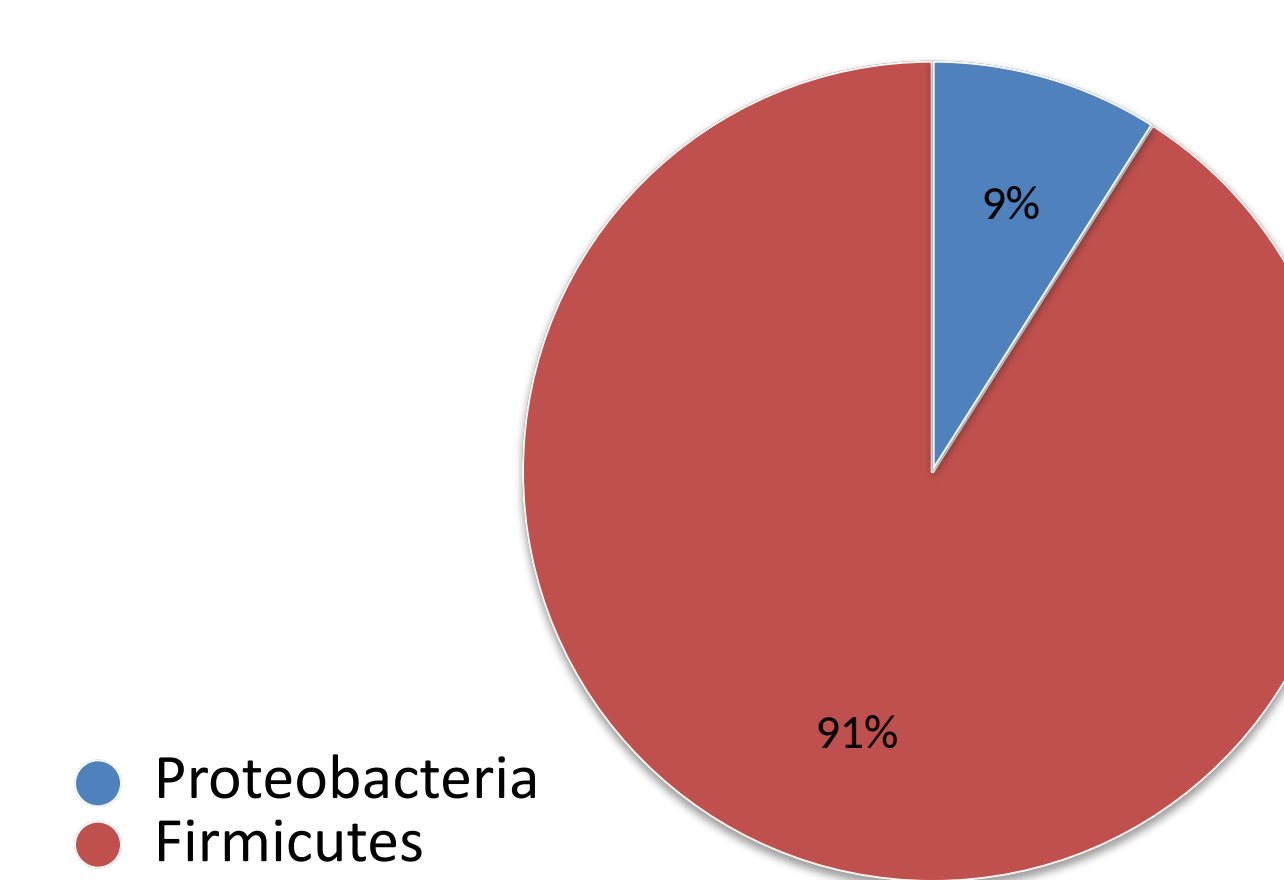
Findings

- Significant difference in pregnancy rates of women with normal vaginal flora when compared to women with abnormal vaginal flora⁸
- *Streptococcus*, *Staphylococcus*, and *Escherichia coli* within the endometrium is associated with poor pregnancy outcomes following in vitro fertilization (IVF)⁴
- A bacterial composition of less than 90% *Lactobacilli* is associated with a decreased likelihood of becoming and maintaining a pregnancy⁴
- Moreno et al found the uterine microbiota associated with spontaneous abortion was characterized as non-*Lactobacillus*-dominant, whereas the microbiota associated with the successful pregnancy was characterized as *Lactobacillus*-dominant
- Increasing amounts of the *Lactobacillus* genus and decreased bacterial diversity were found to be protective against preterm deliveries, whereas *Gardnerella vaginalis* and *Mycoplasma* were associated with an increased risk of preterm delivery⁷
- Donders et al³ found bacterial vaginosis to be associated with a five times increased likelihood of miscarriage
 - Specifically, *G vaginalis*, *U urealyticum*, and *M hominis* were associated with miscarriage
- By the third trimester, changes often occur in the microbiota that is associated with weight gain, insulin resistance, and increased inflammatory response. These changes have also been associated with an increased risk for the development of autoimmune and allergic disease in offspring⁷.
- Myhre et al found the intake of dairy products containing *Lactobacilli* to be a protective factor during pregnancy⁸
- Simone et al⁷ discusses an association between a pregnant individual's gut microbiome and the development of the child's autoimmunity
- Early exposure to probiotics during pregnancy can decrease immune responses and allergies in children⁶

Non-*Lactobacillus*-dominant group



Lactobacillus-dominant group



Discussion

- The microbiota of various organs can play a role in conception, fetal development, and childhood development. *Lactobacillus* bacteria within the uterine and vaginal cavity appear to be important in promoting conception and maintenance of a healthy pregnancy. Whereas *Streptococcus*, *Staphylococcus*, and *Escherichia coli* within the microbiota may be detrimental to pregnancy.
- Findings suggest that the gut microbiome of mother can play a role in the development of the child's immune system.
- Research regarding the benefits of probiotics supplementation is limited and it may be beneficial to further evaluate differences in conception and pregnancy outcomes in woman who choose to supplement with probiotics.
- Providers should consider recommending probiotic supplementation to woman aiming to become pregnant.

Conclusion

To promote an environment that favors conception and pregnancy maintenance, a probiotic can be encouraged to increase the amount of *Lactobacillus* species and eliminate harmful bacteria. Additionally, the use of probiotics can be beneficial to balance the gut microbiome and endorse the healthy development of fetuses and newborns. Probiotics can be encouraged for use by anyone pregnant or aiming to become pregnant, but especially in those individuals who have experienced miscarriages, or other pregnancy complications of unknown cause. They can also be beneficial while a parent is breastfeeding, as the current and future health of newborns can also be impacted by their bacterial exposures.

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