PRESS RELEASE

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Reducing the Risk of Recurrent Preterm Births Using Probiotics

Researchers have found that early pregnancy probiotics containing Clostridium butyricum may help prevent spontaneous preterm delivery

Preterm birth is a major cause of neonatal illness and death, especially among women with a history of premature delivery. Researchers in Japan explored whether taking probiotics early in pregnancy could help reduce the risk of spontaneous preterm delivery (sPTD). In a multicenter clinical trial, women who consumed probiotics containing *Clostridium butyricum* showed lower recurrence rates compared with national averages, suggesting that probiotic therapy may offer a simple strategy to help prevent premature births.

Preterm birth, defined as delivery before 37 weeks of pregnancy, is one of the leading causes of mortality and illness in newborns worldwide. Babies born prematurely face increased risks of complications such as respiratory distress, infections, neurological injury, and long-term developmental disabilities. Women with a history of spontaneous preterm delivery (sPTD) are particularly vulnerable, as the condition often recurs in subsequent pregnancies. Therefore, preventing preterm birth in these high-risk cases remains a significant challenge in obstetric medicine.

A successful pregnancy relies on a carefully balanced immune system. At the maternal–fetal interface, a mother's immune system must tolerate the developing fetus while still protecting it against infections. This tolerance is partly maintained by regulatory T cells (Treg cells), which help suppress excessive inflammatory responses. Recent evidence suggests that the gut microbiome may influence this immune–pregnancy axis. Certain intestinal bacteria, particularly *Clostridium* species, are known to promote the development of Treg cells, and previous studies have found reduced levels of these bacteria in women who experienced sPTD.

In a recent effort to explore whether restoring beneficial gut bacteria could help prevent preterm birth, a research team from Japan led by Associate Professor Satoshi Yoneda from the Department of Obstetrics and Gynecology, University of Toyama, Japan, investigated the potential role of probiotics supplementation during pregnancy. The study was co-authored by Dr. Shigeru Saito, also from the University of Toyama, and involved collaboration with multiple institutions across Japan.

The findings published online on MM DD, 2026, in the *American Journal of Obstetrics and Gynecology*, suggest that probiotics containing the butyrate-producing bacterium called *"Clostridium butyricum*" may help reduce the risk of recurrent sPTD.

"This study was motivated by our desire to reduce the number of children who develop long-term disabilities, especially those born extremely preterm, through appropriate obstetric interventions," says Dr. Yoneda.

To investigate the impact of probiotics on sPTD, the researchers conducted a prospective multicenter clinical trial across 31 hospitals in Japan between 2021 and 2024. The study enrolled pregnant women aged 18 to 43 years who had previously experienced sPTD, placing them at elevated risk for recurrence. Participants between 10 and 14 weeks of pregnancy received oral probiotic tablets and continued supplementation until later phase of pregnancy (36 weeks and 6 days of gestation). Each tablet contained 10 mg of *C. butyricum*, 2 mg of *Enterococcus faecium*, and 10 mg of *Bacillus subtilis* and was taken three times daily throughout the study period.

Among the 315 participants, the recurrence rate of sPTD before 37 weeks was 14.9%, which was significantly lower than the 22.3% recurrence rate reported in Japan's national perinatal database. These findings suggest that probiotic supplementation may help reduce the likelihood of premature birth in women with a prior history of the condition. Encouraging outcomes were also observed for earlier and more severe cases of preterm birth. The total percentage of sPTD was reduced significantly. Importantly, the probiotic regimen showed a favorable safety profile, and no serious adverse events related to the treatment were reported.

The researchers also analyzed changes in the participants' intestinal microbiota during pregnancy. In women who delivered at term, the proportion of *Clostridium* species in the gut increased approximately five-fold after probiotic supplementation. However, this increase was not observed among women who experienced recurrent preterm delivery.

"Probiotics containing butyrate-producing bacteria initiated in early pregnancy may help prevent preterm delivery in women with a history of or at high risk for sPTD," explains Dr. Yoneda.

The authors suggest that future studies are necessary to confirm the effectiveness of probiotic therapy in preventing recurrent sPTD. Overall, this study highlights the potential of probiotics supplementation to help reduce the risk of recurrent sPTD and improve outcomes for mothers and infants.

Image

Title: Preventing spontaneous preterm delivery using probiotics
Caption: A new study suggests that probiotics supplementation during early pregnancy may help reduce the risk of recurrent spontaneous preterm delivery (sPTD). In a multicenter clinical trial, pregnant women who consumed probiotics containing *Clostridium butyricum* showed lower recurrence rates of sPTD compared with national averages. These findings highlight the potential of probiotic therapy as a simple strategy to support healthier pregnancy outcomes.
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Reference

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About University of Toyama, Japan
University of Toyama is a leading national university located in Toyama Prefecture, Japan, with campuses in Toyama City and Takaoka City. Formed in 2005 through the integration of three former national institutions, the university brings together a broad spectrum of disciplines across its 9 undergraduate schools, 8 graduate schools, and a range of specialized institutes. With more than 9,000 students, including a growing international cohort, the university is dedicated to high-quality education, cutting-edge research, and meaningful social contribution. Guided by the mission to cultivate individuals with creativity, ethical awareness, and a strong sense of purpose, the University of Toyama fosters learning that integrates the humanities, social sciences, natural sciences, and life sciences. The university emphasizes a global standard of education while remaining deeply engaged with the local community.

Website: https://www.u-toyama.ac.jp/en/

About Associate Professor Satoshi Yoneda from the University of Toyama, Japan
Dr. Satoshi Yoneda is an Associate Professor in the Department of Obstetrics and Gynecology at the University of Toyama, Japan. His research focuses on preterm birth, pregnancy complications, and maternal–fetal medicine, particularly the mechanisms underlying spontaneous preterm delivery. He has authored numerous peer-reviewed publications in obstetrics and gynecology. His research publications have received over 1,400 citations, and he has an h-index of 23, reflecting his contributions to advancing research on pregnancy and related complications.

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Media contact: Yumiko Kato
E-mail: ykato@ctg.u-toyama.ac.jp