

Probiotics increase gut bacteria diversity in extremely preterm infants

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Extremely preterm infants can suffer from a life-threatening inflammation of the gut. A new clinical study has shown that supplements of a lactic acid bacterium may have positive effects by

increasing the diversity of intestinal bacteria in these infants. The study has been led by researchers at Linköping University, Sweden, and published in the scientific journal *Cell Reports Medicine*.

A liter of milk weighs a kilogram. Most [infants](#) who are born extremely prematurely weigh less than that. An infant who should have developed and grown for three more months in the protective environment of the mother's womb is, of course, extremely vulnerable. As a consequence of advances in [neonatal care](#), many [premature infants](#) survive, although one out of four of the extremely premature infants die.

"Preterm infants can be affected by a very severe inflammation of the intestines, which almost only occurs in such infants. The condition, necrotising enterocolitis (or NEC), leads to parts of the intestine dying. One of three infants who contract the infection die, and those who survive often suffer from long-term complications such as short gut syndrome and neurodevelopmental disabilities," says Thomas Abrahamsson, pediatrician at the [neonatal intensive care unit](#) at Crown Princess Victoria Children's Hospital and associate professor at the Department of Biomedical and Clinical Sciences (BKV) at Linköping University, who has led the study.

The bacteria in the intestine of preterm infants differ from those in full-term infants. This has led many people to investigate whether giving [probiotic supplements](#) that contain certain bacteria has a positive effect. One finding is that the lactic acid bacterium *Lactobacillus reuteri* can reduce the risk of NEC in preterm infants. It is, however, not clear whether this is true also for extremely preterm infants, nor is the mechanism behind the positive effect known.

The study now published is part of a clinical study carried out in Linköping and Stockholm. The researchers looked at 132 infants who had been born extremely prematurely, between week 23 and 28 of

pregnancy, i.e. 17 to 12 weeks before the due date. All weighed less than a kilogram at birth. Each infant was randomly assigned to one of two groups: to receive oil drops that contained the probiotic or placebo. The treatment was given daily during the neonatal period. The scientists investigated how the intestinal bacterial flora was influenced by the supplement of *L. reuteri*, and analyzed bacteria in the stools at several time points.

"We see that the composition of bacteria in the intestine differs during the first month of the probiotic treatment. During the first week of life, the bacterial groups *Staphylococcus* and *Klebsiella*, which may cause disease, were more common in the group that received placebo," says Magalí Martí Generó, principal research engineer in BKV, and principal author of the article.

Klebsiella can cause inflammation and has been associated with NEC and sepsis. The present study does not allow any conclusions about whether the probiotic treatment influences the risk of these diseases in these extremely premature infants. Larger studies will be required to determine this.

"The supplemented probiotic *L. reuteri* survives in the intestine, even though these extremely premature infants are treated with large doses of antibiotics that kill bacteria. The positive effect of the treatment in increasing the diversity of intestinal bacteria may be one mechanism behind the positive effects of this [probiotic](#) shown in previous studies," says Thomas Abrahamsson.

Supplementation with probiotics is used in increasing numbers of neonatal clinics. The [scientific evidence](#) that supplements of probiotics to [preterm infants](#) have a [positive effect](#) and can be used safely is considered to be sufficiently strong.

More information: Magalí Martí et al, Effects of *Lactobacillus reuteri* supplementation on the gut microbiota in extremely preterm infants in a randomized placebo-controlled trial, *Cell Reports Medicine* (2021). [DOI: 10.1016/j.xcrm.2021.100206](https://doi.org/10.1016/j.xcrm.2021.100206)

Provided by Linköping University

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