

Faecal transplant may protect premature babies from fatal bowel disease

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Credit: University of Copenhagen

Children born prematurely often experience serious problems with the gastrointestinal tract and therefore have increased risk of developing life-threatening bowel infections. Now, researchers from the University of Copenhagen have shown in a study on pigs that transplantation of faeces from healthy pigs changes the bowel's bacterial composition in those born prematurely and protects them from the fatal bowel disease necrotizing enterocolitis (NEC).

Globally, 5–10 percent of all newborns are premature. At this stage, their

organs and immune systems are not mature, and the [children](#) are therefore highly susceptible to serious infections. One of the problems facing a lot of children born prematurely is the immaturity of the [gastrointestinal tract](#), which, among other things, causes them to be hypersensitive to [bacteria](#). Now, a study conducted by [researchers](#) of biomedicine at the University of Copenhagen offers new hope.

Using [pigs](#) born prematurely, the researchers tested faeces transplantation, and report a drop in the incidence of the fatal [bowel](#) disease necrotizing enterocolitis (NEC) following transplantation. "We are able to protect the bowels of [pigs](#) born prematurely by transferring faeces from healthy donor pigs via the rectal opening. The composition of intestinal bacteria in these animals changes significantly, and we see 75 percent fewer cases of NEC. And this is important, because a lot of children die from this disease. If the results can be transferred to children born prematurely, this form of treatment can save lives and possibly reduce the amount of antibiotics given to these patients," says co-author of the study, Professor Per Torp Sangild from the Department of Veterinary and Animal Sciences at the University of Copenhagen.

Fighting for Intestinal Balance

In the study, the researchers examined 130 pigs born prematurely. They chose the pig as their test animal because the gastrointestinal tract of pigs resembles that of humans and because pigs develop a severe intestinal infection that can be compared to NEC.

Scientists do not know exactly why children born prematurely develop this serious intestinal infection, which in up to 40 percent of cases is fatal, but they do know that intestinal bacteria play a vital role.

"The bowel is like a battlefield where the newborn and its bacteria must communicate with each other to establish peaceful coexistence.

However, the immature bowel is probably not ready to take control, and therefore needs good bacteria that contribute to the balance of the system. And the right composition of bacteria appears to be of vital significance. From previous studies among pigs, we know that neither probiotics nor faeces from the mother are as effective as faeces transplantation. A comparison of seemingly uniform donors has even shown a clear difference in the ability to prevent NEC. We would like to know why this is so," says first author of the study, Ph.D. Student Anders Brunse from the Department of Veterinary and Animal Sciences.

The Importance of Normal Flora

In the study the researchers measured how the intestinal bacteria composition changes in pigs born prematurely following faeces transplantation. This has shown an increase in the wealth of bacteria and the introduction of bacteria that form part of the bowel's normal flora.

"Through faeces transplantation immediately after birth, we can probably achieve stability in the intestinal bacteria composition faster. This can help them become resistant to bowel infection," says co-author of the study, Professor Thomas Thymann from the Department of Veterinary and Animal Sciences.

More information: Anders Brunse et al, Effect of fecal microbiota transplantation route of administration on gut colonization and host response in preterm pigs, *The ISME Journal* (2018). [DOI: 10.1038/s41396-018-0301-z](https://doi.org/10.1038/s41396-018-0301-z)

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