Meet the bacteria that save babies

A big, successful test “The researchers chose Lactobacillus plantarum after carefully studying its ability to colonise the infant gut over a long period.” | Photo Credit: Splendens/Getty Images/iStockphoto

That babies born by Caesarean section are at a slightly higher risk of developing obesity, asthma and other ailments than children born vaginally is now well known. The reason: in a vaginal birth, a baby ingests some of the microbes present in the vagina during the time of delivery. These bacteria colonise the newborn’s gut and keep it healthier when compared with babies born through a C-section.

However, in the case of India, infants born even vaginally are more prone to infection and sepsis, which causes many deaths. Now, a community-based trial carried out on newborns in rural Odisha has found that administering synbiotics for a week beginning 2-4 days of life could bring about 42% reduction in sepsis.

With 30 per 1,000 live births, the incidence of hospital-based sepsis is huge in India and about a fifth of neonates with sepsis die in the hospital; community-based studies indicate an incidence as high as 17% of all live births. About 30% of sepsis-related deaths occur in the second week, whereas it is around a fifth in the third and fourth weeks, according to a paper in the *Journal of Perinatology* (December 2016).

There was also a reduction in lower respiratory tract infections such as pneumonia, which was “completely unexpected”. The reduction in respiratory tract infections suggests that synbiotics not only enhanced the gastrointestinal immunity but also overall immunity in the newborns. The week-long treatment costs about $1.

Synbiotics are a combination of probiotic or live microorganisms that provide health benefits and prebiotic which promote growth and sustain colonisation of the probiotic strain. In this case, *Lactobacillus plantarum* was used as a probiotic. A carbohydrate (fructooligosaccharides) that occurs naturally in plants such as onion, garlic and banana was chosen as the prebiotic. The researchers chose *L. plantarum* after carefully studying its ability to colonise infant gut over a long period. The bacteria have been shown to protect infants during the early weeks of life. “The bacteria is safe and does not cause problems in sick and even immunocompromised babies,” says Dr. Sailajanandan Parida from the Department of Paediatrics, S.C.B. Medical College, Cuttack, Odisha, and one of the authors of the paper. “The bacteria colonise the gut and do not allow harmful bacteria to grow. They stimulate the immune system so babies are able to produce antibodies against pneumonia and sepsis-causing bacteria.”

Researchers from the University of Nebraska Medical Center, U.S. and India studied over 4,550 infants born to mothers from 149 villages in Odisha, where neonatal and infant mortality rates are among the highest in India. The babies were at least 2 kg at birth and had completed at least 35 weeks of gestation. To eliminate any kind of bias in the conduct of the trial, the newborns were randomly assigned to receive either the synbiotics or a dummy. Neither the researchers nor others knew who received what. Half the participants received the synbiotics while the other half received the dummy. The babies were monitored for 60 days, the most critical period when they get sick and die.

The researchers had anticipated only 20% reduction in sepsis but as the reduction was more than twice than what was anticipated, the trial was stopped midway. It is not uncommon for trials to be stopped midway when the results are overwhelmingly positive. Denying newborns the benefits of

the synbiotics, which have been found to be beneficial, would be considered unethical if the trial is continued. The results were published a few days ago in the journal *Nature*.

“The synbiotics can be introduced as a preventive measure for sepsis. It should be given for seven days, 2-3 days after birth,” says Dr. Parida.

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Lifestyle-related risk factors are being cited, compounded by an inadequate number of treatment centres in the region

Without policies to stop the worrying spread of antimicrobial resistance, the mortality rate could be disturbing

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