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Commentary

The Role of Probiotics in Enhancing Neonatal Immunity

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DESCRIPTION

The concept of probiotics has changed as scientific interest in host-microbe interactions has increased. The original definition indicated that the live active culture benefits the host by enhancing the balance of intestinal microbes, however contemporary ideas are based on the effects of well identified strains on specific targets and sites. A crucial step in keeping the intestinal milieu healthy while it fulfils its dual purpose of producing an inflammatory response to pathogens and preserving hyporesponsiveness to harmless antigens is the formation of a normal microbiota in the intestine. On the idea of a healthy, well-balanced gut flora, probiotic therapy is established. But each strain performs differently as a probiotic. Different bacteria have distinct immunological effects, distinct adhesion locations, and different effects on healthy versus inflamed mucosa. Therefore, present probiotic research is focused on identifying specific strains with anti-allergenic potential despite recent evidence of the significant immunoregulatory potential of the healthy, well-balanced gut microbiota.

The Nobel laureate Élie Metchnikoff first introduced the idea that some microbes, particularly fermented milk products containing lactic-acid-producing bacteria in particular, can improve human health in the early 20th century. A chemical or organism that supports the gut microbial balance was suggested to be a "probiotic" in 1965. Since then, the concept of probiotics has changed to emphasise health benefits over impacts on microbiota composition, emphasising the need for rigorously demonstrated clinical efficacy. The probiotics that have been studied the most so far belong to the genera *lactobacilli* and *bifidobacteri*. The majority of probiotic bacterial strains were initially isolated from the intestinal microbiota of healthy humans.

Probiotics are currently defined as specific microbial cultures with documented targets for either lowering the risk of human disease or for their nutritional management to promote infant health. The rationale for using probiotics stems from experimental and epidemiological findings linking the establishment and composition of the intestinal microbiota with healthy immune maturation or development of disease, several potential targets identified through basic research, and the majority of currently available probiotics. Recent reviews have examined the possible advantages of probiotic usage in children. Treatment of acute viral gastroenteritis, avoiding antibiotic-associated diarrhoea, and reducing inflammatory symptoms in IBD patients are the key components of this. The effects on colicky newborns have been minimal. However, a recent study found that *Lactobacillus* reuteri administration significantly reduced colic symptoms within a week compared to infants treated with simethicone. This improvement was attributed to the antimicrobial effect of the bacteria on six species of gas-forming coliforms that were isolated from the colicky infants.

They have concentrated this study on the very early administration of probiotics when the gut microbiota is not yet fully established because of the likely relationship between the early bacterial pattern and later health status reported. Numerous attempts to augment infant formula with probiotic strains have been made over a lengthy period of time, and many of this research have just lately been published. According to reports, using these medications early on can help prevent the late onset of several ailments. According to the study, administration is frequently started soon after delivery and might last anywhere between a few days and several weeks or months. Finally, there were different doses, ranging from 106 to 109 CFU/mL or/g. The probiotic strains Bifidobacterium animalis subspecies *lactis, B longum, Lactobacillus rhamnosus, L reuteri, L johnsonii,* and *Streptococcus thermophilus* were the most often researched ones, either individually or in combination. Studies on the impact of such supplementation on growth have been conducted. However, growth has not been significantly impacted and has not suffered any consequences. In addition, no decrease in gastrointestinal or respiratory infections or in the need of antibiotics has been recorded, although only a small number of research have looked into this effect, preventing firm conclusions from being made. A further challenge in evaluating probiotics' health-promoting effects is that their characteristics vary depending on the strain, which may account for differences

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in the effects that have been seen. Second, the probiotics' mechanism(s) of action aren't necessarily well-established. Due to their interactions with the immune system, barrier functions, and gut flora, probiotics can have positive impacts on health. Probiotic supplements, in particular, have been proven to affect intestinal maturation, as was seen when preterm children were given *Bifidobacterium* lactis, which caused the intestinal IgAs response to mature. Similar to this, high SIgA levels at 6 months were maintained in full-term babies when given infant formula containing two probiotic strains as opposed to the control group. Furthermore, it was hypothesised that such supplementation would have a synergistic effect on gut humoral immunity at 12 months of age, as evidenced by the finding that probiotic-supplemented breastfed infants had significantly higher total IgM, IgA, and IgG titers than placebo-supplemented infants who had been breastfed exclusively for at least 3 months. By encouraging the creation of mucin, probiotic strains can also enhance how well the gut barrier operates. Additionally, they can directly interact with intestinal bacteria by secreting bioactive substances that stop the tight junction proteins from changing during inflammation.

Last but not least, the extremely abnormal pattern seen in VLBW infants in particular may cause an abnormal maturation of the intestinal ecosystem's functions. As evidenced by a higher risk of allergy in infants born with a very low birth weight, it may in fact be a factor in the development of late-onset diseases like obesity and allergies.