An Update on the Gut Microbiome and the Use of Probiotics for Disease Prevention in Preterm Infants



Very low birth weight infants (VLBWIs) are at high risk for inflammatory diseases including necrotizing enterocolitis (NEC) or neonatal sepsis, which are primary causes of neonatal mortality. The intestinal microbiota plays an essential role in maintaining local immune homeostasis and enhancing the intestinal barrier in preterm infants; however, appropriate intestinal colonization with normal flora after birth is interrupted by immature gastrointestinal tract, intestinal mucosal damage, insufficient nutrient transport, or formation of abnormal intestinal flora due to the use of antimicrobials in VLBWIs. Large randomized controlled trials and meta-analyses have highlighted the potential benefits of the clinical use of probiotics on NEC or neonatal sepsis for immunologically immature VLBWIs. However, standardized guidelines for the optimum strain, combination of strains, dosage, timing, and duration of probiotics are unknown for the routine application of probiotics in VLBWIs. Here, we review the results of previous studies on the effects of probiotics in preventing morbidity, NEC, or neonatal sepsis in VLBWIs with the administration of single-strain or multi-strain probiotics. Future clinical trials should address the safety of each probiotic strain and the potential efficacy of strain combinations for the routine use of probiotics in preterm infants. The key findings of the manuscript: This study reviewed the focus on the efficacy of probiotics for the prevention of sepsis and necrotizing enterocolitis in preterm infants weighing less than 1,500 g at birth according to single-strain probiotics or multi-strain probiotics.