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Perspective

Staphylococcus Epidermidis Bacteria Role in Infants Health

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DESCRIPTION

Although the severity of the episodes brought on by this species is sometimes overestimated, it may have relevant short-and long-term negative impacts on newborn outcomes. *Staphylococcus epidermidis* has emerged as the primary agent causing neonatal late-onset sepsis in preterm neonates.

Perhaps the most common microbe found on human skin and mucosal surfaces is *Staphylococcus epidermidis*. This species appears to benefit newborns by thwarting dangerous diseases and enhancing innate immunity. *S. epidermidis* is the most prevalent bacterium in colostrum and milk from healthy women, and there is a mother-to-infant transmission through breastfeeding. In fact, its presence is known to be a differential trait of the faecal microbiota of breast-fed infants when compared to formula-fed ones, being present in the first meconium obtained from both term and preterm breast-fed neonates. However, coagulase-negative staphylococci.

Preterm neonates may significantly alter the commensal or advantageous role of *S. epidermidis* in healthy hosts, including infants. The transformation of *S. epidermidis* from a symbiont member of the human microbiota to an extremely important opportunistic infectious agent can be attributed to a number of factors in the Neonatal Intensive Care Unit (NICU), including the widespread use of medical devices (catheters, enteral feeding tubes, mechanical ventilation, etc.) where they can quickly form thick biofilms, the selective pressure caused by antibiotics, or the immunocompromised status of the host. As a result, both in industrialized and developing nations, this species has become the main cause of neonatal Late-Onset Sepsis (LOS) in preterm infants with Very Low Birth Weight (VLBW). In comparison to other LOS agents, LOS through CNS is typically linked to reduced fatality rates. However, in addition to sepsis, *S. epidermidis* is linked to a number of neonatal morbidities, including bronchopulmonary dysplasia, white matter injury, necrotizing enterocolitis, and retinopathy of prematurity, all of which have negative short-and long-term consequences for neonatal outcomes.

In contrast to donor milk and preterm formula, which are typically sterile before being administered through enteral feeding tubes, Mother's Own Milk (MOM) contains their own bacteria. Human milk provides the infant gut with a consistent supply of commensal and maybe probiotic bacteria and has been demonstrated in recent studies to include a site-specific microbiota. CNS, and especially *S. epidermidis*, has been shown to be the prevalent species in this biological fluid in the majority of culture-dependent and culture-independent research on the human milk microbiota. The development of a healthy infant gut microbiota is driven by these bacteria once they have entered the infant's digestive tract. These bacteria may also contribute to the infant's metabolism, defense against infections, immunomodulation, or neuromodulation, among other roles.

The various milk varieties were then given through enteral feeding tubes, which are effective tools for the enrichment and proliferation of high-risk hospital-associated clones, which later serve as reservoirs of such clones. Preterm newborns have gastric pH levels that are closer to neutrality and a more flexible pylorus than adults, which permits gut microbes to enter the gastric compartment. Later, the common NICU practice of aspirating and measuring the residual gastric content prior to administering the next feeding causes the upper portions of the enteral feeding systems, including the external portions, to become contaminated with the high-risk clones that are characteristic of the preterm gut microbiota. Because feeding tubes are typically left in newborns' digestive tracts for 24 to 72 hours and maintained at a temperature that supports the growth of many facultative anaerobic bacteria (CNS, enterobacteria, etc.), these microorganisms have ample opportunity to develop thick mixed biofilms on the interior surface of the tubes. This may account for some of the donor milk and infant formula samples that had *S. epidermidis* after passing through these feeding systems, but additional sources, such as family members and healthcare providers, should not be discounted and should be considered in future research.

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