Peripartum Antibiotics Induce Dysbiosis and Predispose the Neonatal Gut Towards Inflammation

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Peripartum Antibiotics Induce Dysbiosis & Predispose the Neonatal Gut To Inflammation

Alain Cuna, Marianne Nsumu, and Venkatesh Sampath

Background
❖ Broad-spectrum antibiotics (ABX) in preterm infants have been associated with necrotizing enterocolitis (NEC).
❖ The exact mechanisms that explain this association remain poorly defined.

Objective
❖ To examine the impact of peripartum antibiotics on gut microbiota and intestinal inflammation in the developing mouse gut

Methods
❖ C57BL6 dams administered ABX from E15 to P14 compared to Controls
❖ Gut microbiota assessed with targeted 16S PCR
❖ Inflammation and injury assessed with PCR and histology

Gut microbiota (dams)
❖ Gut bacterial abundance decreased with ABX
❖ Proteobacteria selectively enriched with ABX

Inflammation
❖ Baseline inflammation increased in DOL8 Pups
❖ Inflammation persisted despite ABX cessation by DOL14

Intestinal Injury
❖ No histologic evidence of injury with ABX

Conclusion
❖ ABX exposure during the early critical period after birth induces gut dysbiosis and negatively impacts the developing gut towards inflammation
❖ These results support ongoing efforts of antibiotic stewardship that avoid routine ABX in preterm infants without risk factors for sepsis.