

The effect of intrapartum antibiotic prophylaxis (IAP) on the neonatal gut microbiome and the clinical consequences of any observed changes: a systematic review

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Reference: Seedat F et al. BMC Pregnancy and Childbirth. 2017;17(1)

Background:

IAP is an established preventative method for early onset GBS infection in neonates. The time immediately following birth is a critical stage of microbial development. The impact of this early antibiotic exposure on the gut microbiome is not yet fully understood. IAP is associated with a reduced bacterial diversity which has been linked to many diseases later in life.

In an attempt to reduce the short-term risk of early onset neonatal infections are we unintentionally increasing the long-term risk of morbidity in children?

Results:

14 observational studies comprising 1592 infants shows that neonates exposed to IAP had lower microbial diversity, lower levels of Actinobacteria, higher levels of Proteobacteria compared to unexposed neonates.

Results for Bacteroidetes and Firmicutes varied. Microbial changes were not followed through to clinical outcomes. These findings consolidated results from Seedat et al.

No associations were found between IAP and childhood obesity, respiratory infections or atopy. Only one study demonstrated a significant finding regarding long-term adverse events in relation to colic.

Studies were found to be inconsistent and at a risk of bias, especially due to a range of confounding variables pre-, peri- and postnatally.

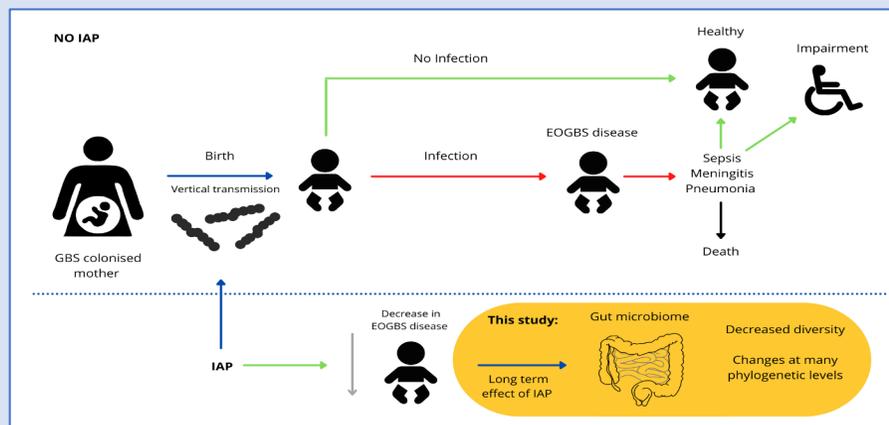


Figure 1: An overview of the development of EOGBS including the implications and prevention as well as highlighting the long term effects of IAP on the neonatal microbiome

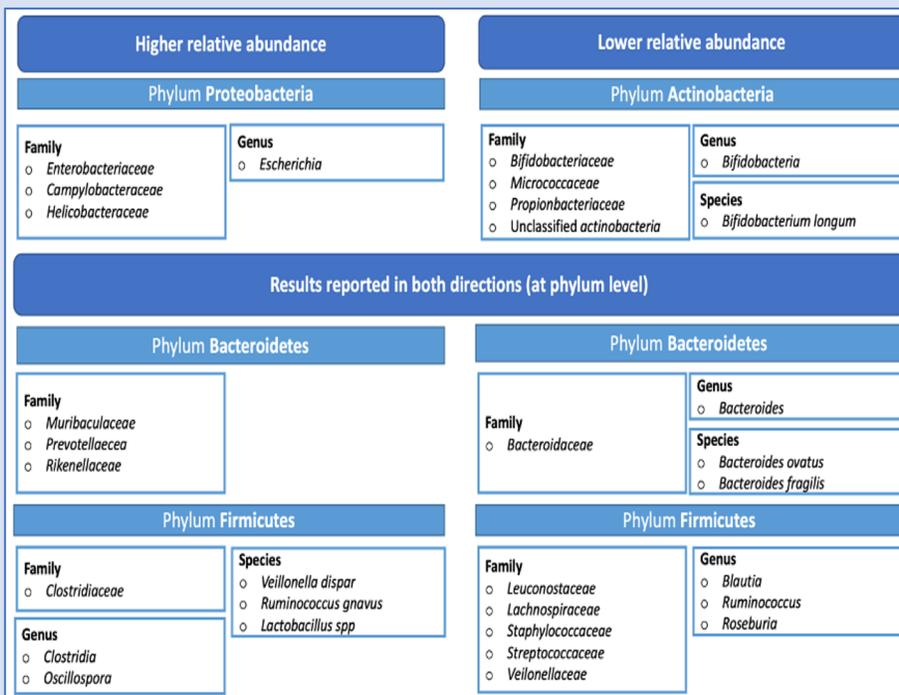


Figure 2: A summary of the significant differences observed at the taxonomic levels they were reported at in all included studies between the age of 1 day to 12 months

Aims:

- To investigate the impact that IAP has on the neonatal gut microbiome.
- To investigate any clinical consequences of observed changes to the neonatal gut microbiota.

Our systematic review updates the Seedat et al. (2017) review

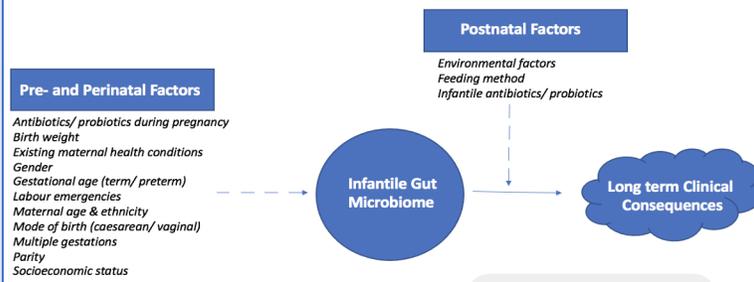


Figure 3: Summary of factors influencing outcomes assessed in this review

Conclusion:

Consistent evidence shows that IAP has a significant impact on the neonatal gut microbiome up to one year after birth. Further exploration is required to determine the clinical relevance of microbial dysbiosis and if this is correlated to disease development.

Large high-quality longitudinal studies that assess a range of long-term outcome measures and take all confounding factors into account, must be completed.