# THE EFFECT OF INTRAPARTUM ANTIBIOTIC PROPHYLAXIS ON NEONATAL GUT AND ORAL BACTERIOME

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## BACKGROUND

Intrapartum antibiotic prophylaxis (IAP) is commonly used in C-section delivery (CS) and in Group B *Streptococcus*-positive (GBS) women before vaginal delivery (VD). IAP may affect neonatal microbial colonization:

- directly by passing into the fetal/neonatal bloodstream
- by passing into breast milk
- by reduced transmission of susceptible bacterial groups from mother to infant

**24 %**

C-SECTION WORLDWIDE PREVALENCE

**18 %**

GBS WORLDWIDE ESTIMATED PREVALENCE

**OUR STUDY AIMED TO INVESTIGATE THE EFFECT OF EXPOSURE TO ANTIBIOTICS DURING DELIVERY ON THE NEONATAL MECONIUM AND TRANSITIONAL STOOL AND ORAL MUCOSA BACTERIOME**

## METHODS

Newborns (n = 66) from the CELSPAC: TNG cohort divided in 3 groups:

CS with IAP | VD with IAP | VD without IAP


Stool swabs from the single-use diaper were collected and evaluated as meconium (1-3 days after birth) or transitional stool (3-5 days after birth)

Buccal swabs were collected within 48 hours after birth or within 3-5 days

*16S rDNA* gene sequencing was performed with the MiSeq reagent kit V3 using a MiSeq 2000 instrument.

## RESULTS

### MECONIUM

- No significant differences in bacterial abundance or diversity.

### TRANSITIONAL STOOL

- Significant differences in neonatal transitional stool bacteriome among three studied groups (PERMANOVA; q=0.001) (Figure 1B).
- Groups of CS and VD with IAP were significantly associated with ↓decreased relative abundances of genus *Bifidobacteria* (q=0.007) and *Bacteroides* (q=0.007).
- Abundance of *Enterococcus* (q=0.009) and *Rothia* (q=0.012) was significantly ↑increased in CS neonates compared to VD neonates without IAP (Figure 2).
- ↓ decreased number of observed amplicon sequence variants (ASVs) in CS neonates (p=0.02) compared to the VD neonates (Figure 1A).

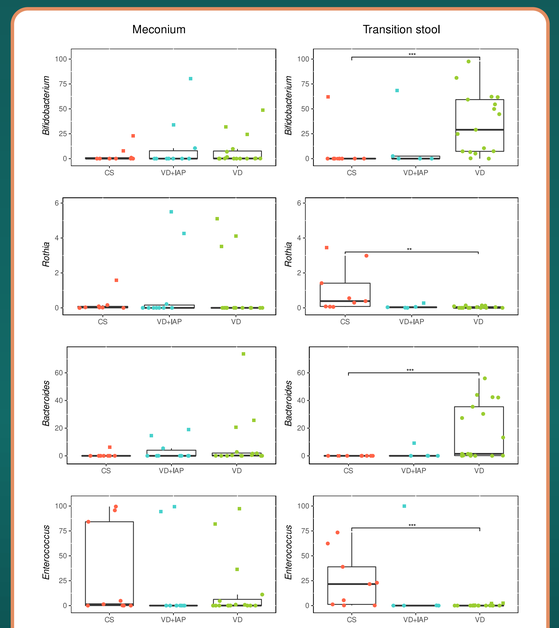


**Figure 2.** Relative abundance of significantly different bacterial genera in meconium and transitional stool samples (*** p<0.001; ** p<0.01; * p<0.05)

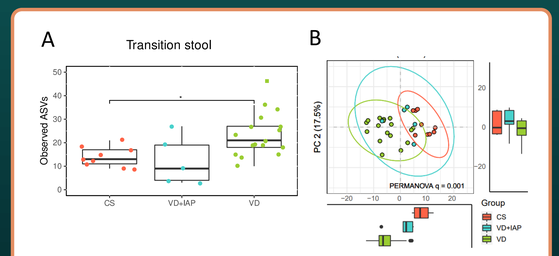


**Figure 1. A)** Observed ASVs in neonatal transitional stool samples (* p<0.05); **B)** Principal component analysis of neonatal transitional stool samples

## Do antibiotics during labor affect neonatal oral bacteriome as well?

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### ORAL MUCOSA

- Differences in alpha diversity (Shannon index, p=0.01) and bacterial composition (PERMANOVA, p=0.04) were observed in oral samples collected within 48 hours after birth (Figure 3A).
- No significant changes in the bacteriome of oral samples collected after 48 hours.
- Significantly ↓ lower relative abundance of *Gemella* in samples within 48 hours after birth (Figure 3B).

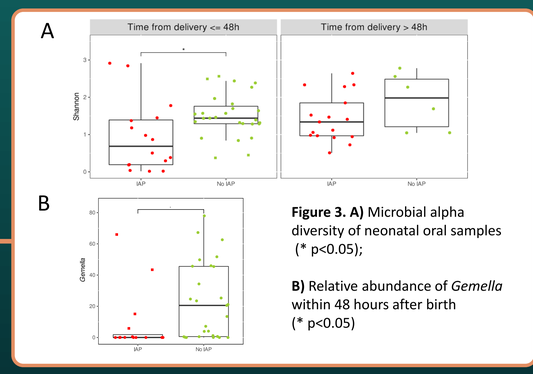


**Figure 3. A)** Microbial alpha diversity of neonatal oral samples (* p<0.05);

**B)** Relative abundance of *Gemella* within 48 hours after birth (* p<0.05)

## Does exposure to antibiotics during labor affect neonatal gut bacteriome in the first week of the neonate´s life?

## CONCLUSIONS

- The effect of IAP on bacterial abundance and diversity is not reflected in meconium samples yet but is observed in transitional stool samples.
- IAP influences the oral bacteriome of neonates within 48 hours after birth. However, the effect of IAP seems to be suppressed later in the first week of their life.

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