**Background**

The important role of gut microbiome in maintaining good health has been increasingly demonstrated in recent years. The gut microbiome of preterm infants is known to be different from that of the term infants (Berrington et al., 2013; Barrett et al., 2013). However, only a few studies reported and compared the longitudinal changes in gut microbiome between the preterm and term infants. We are establishing a birth cohort with preterm and term infants and aim to follow them up until they are five years old. In this study, we are going to present our preliminary data, and to characterize the gut microbiome of our term and preterm subjects within the first 10 days of life (birth) and at 1 month old (1 mo).

**Methods**

One hundred and eighty-four preterm and 26 term infants were recruited from the Prince of Wales hospital and the Stanley Ho developmental cohort, respectively. Stool sample were collected into a plastic container within the first 10 days of life and at 1 month old and frozen until analysis. The faecal microbial DNA of 371 stool samples were extracted and the 16S rRNA sequencing was performed. Microbiome data pre-processing and statistical analysis were performed by using Qiime2 (Bolyen et al., 2019) and MicrobiomeAnalyst (Chong et al., 2020; Dhariwal et al., 2017).

**Results**

The taxa abundance of term and preterm infants at two timepoints is shown in fig.1. LefSe analysis showed that, for the 1st timepoint, Klebsiella in preterm infants’ samples (LDA = 5.84; p = 0.02; FDR = 0.075) and Bifidobacterium in term infants’ samples (LDA = 5.81; p = 7.9 x 10-3; FDR=0.05) are the features most likely to explain the differences in two groups. For the 2nd time point, LefSe analysis showed that higher abundance of Streptococcus (LDA = 5.73; p = 1.4 x 10-9; FDR=1.1x 10-8) and Bifidobacterium (LDA = 6.24; p = 3.3 x 10-5; FDR=1.3x 10-4) were found in term infants’ samples. Significantly higher richness level (ACE: 3.0 (preterm), 4.8(term); p = 0.004) was also in the term subjects than the preterm subjects.

**Conclusions**

Our preliminary results showed the difference in gut microbiome between preterm and term infants within the first 10 days of life and at 1-month-old. Term infant’s gut microbiome is characterized by the increased level of Bifidobacterium and Streptococcus while preterm infant’s gut microbiome is characterized by its high abundance of Klebsiella.

**References**

Barrett et al., *Arch Dis Child Fetal Neonatal*, 2013.98, F334–40
Berrington et al., *Arch Dis Child Fetal Neonatal*, 2013. 98(4): F286-F290

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