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Conference Theme: “Biodiversity of Foodborne Microbes”

BOOK OF ABSTRACTS

Exploring biodiversity in microbial ecosystems along the food chain

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Dietary interventions modify the gut microbiota during pregnancy in patients with gestational diabetes mellitus (GDM)

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Gestational diabetes mellitus (GDM) is one of the most common pregnancy complications, associated with an increased risk of maternal and perinatal outcomes. It has been hypothesized that interventions on life style can have beneficial effects due to the modulation of the maternal gut microbiota during pregnancy.

Microbiota is remodeled at several body sites during pregnancy and dietary habits and quality of micronutrients may affect gut microbial composition. Increased knowledge of how change in foods and nutrients can modulate gut composition in pregnant women is thus of importance, not only for the mother but also for the unborn child.

We performed a prospective observational study evaluating the microbiota of 41 patients with GDM from the second to the third trimester of pregnancy after following a diet in line with given guidelines. The fecal microbiota was assessed by 16S amplicon based sequencing and daily dietary information as well as blood metabolites were analyzed. Overall we found a higher bacterial richness as pregnancy progressed in our GDM patients with strong correlation between pro-inflammatory taxa associated with GDM and metabolic and inflammatory variables. After the dietary counselling, 34.1% of the participants showed to be adherent to the given dietary recommendations. Adherent patients showed significantly reduced intakes of simple sugars and increased consumption of fiber, oligosaccharides and polyunsaturated fatty acids (PUFA) if compared with non-adherents. C-reactive Protein (CRP) values, blood glucose, fasting insulin and Homeostasis Model Assessment Insulin Resistance (HOMA-IR) score were significantly lower in adherents. This reduction in inflammatory variables was strictly correlated with the increase in *Faecalibacterium*, *Blautia* and R-*Ruminococcus*. In addition adherent showed significant reduction of *Bacteroides, Veillonella* and *Rikenellaceae.* We then observed a negative correlation between *Blautia* and total cholesterol, CRP and HOMA-IR. At sub-genus level, we observed a higher number of *Blautia* oligotypes and several oligotypes were associated with PUFA or negatively correlated with cholesterol. That evidence suggests an effect of the dietary intake at sub-genus level highlighting a possible different strain-dependent effect on gut.

Patients with adherence to the given dietary recommendations showed a significant reduction in inflammatory variables and pro-inflammatory microbiota with respect to non-adherents.

Keywords: Gut Microbiota; Gestational Diabetes Mellitus (GDM); Dietary Interventions; Metabolic Syndrome; Diet