

Changes in offspring gut microbiota profiling due to a Mediterranean diet in pregnancy

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Objective

To investigate the influence of a Mediterranean diet intervention during pregnancy on infant gut microbiota.

Methods

In the IMPACT BCN randomized clinical trial conducted at a University Hospital in Barcelona, Spain (2017-2020), pregnant women at 19-23 weeks' gestation were randomly allocated into: a Mediterranean diet intervention, a stress reduction program or non-intervention. Participants in the Mediterranean diet group received monthly educational sessions, extra-virgin olive oil and walnuts. Offspring's fecal samples were collected at the 1-3 months of postnatal age from the Mediterranean diet (n=40) and non-intervention (n=40) groups. Infants' microbiota composition, richness and diversity were analyzed by 16s rRNA gene sequencing. Multivariate models were used to evaluate associations of microbiota and each intervention.

Results

The genus *Bifidobacterium* was the bacterial group showing the highest levels in our cohort, followed by members of the family *Enterobacteriaceae* and *Bacteroides*. While no differences in total bacterial levels were observed between groups, levels of *Bifidobacteria* were significantly higher in the Mediterranean diet group compared to the control ($p=0.007$). As expected, a sub-analysis on the route of delivery revealed less abundance of *Bacteroides* in infants delivered by cesarean section ($p=0.05$) as compared to vaginal delivery, in the non-intervention group. These differences were not apparent in the Mediterranean diet group with a similar *Bifidobacterium* pattern in infants delivered vaginally versus caesarean delivery.

Conclusion

Promotion of Mediterranean diet during pregnancy has a beneficial effect on infant gut microbiota. In addition, the maternal Mediterranean diet might prevent the loss of *Bacteroides* usually associated with caesarean delivery.