GUT MICROBIAL DIVERSITY AND DIET-GUT MICROBIOTA ASSOCIATIONS IN SELECTED CHILDREN IN TAGUIG CITY

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Background:
The human gastrointestinal tract consists of a diverse ecosystem of microorganisms collectively known as the gut microbiota. Its composition is known to be significantly influenced by the diet.

Objectives:
This study aimed to characterize the gut microbial composition of selected Filipino children, and assess its association with their habitual diet.

Materials and methods:
An 81-item semi-quantitative Food Frequency Questionnaire (FFQ) was used to determine food intake of normal-BMI children aged 7 to 11 years old (n=44) in Taguig City. Energy, carbohydrate, protein, fat and dietary fiber intakes were estimated using the Philippine Food Composition Tables database. Fecal microbiota was characterized by high-throughput 16S rRNA sequencing of the V3-V4 region. Microbial diversity was measured by Shannon Index and Simpson Index, and the association of macronutrient and dietary fiber intakes with the relative abundance of microorganisms was determined by Spearman’s rank correlation test.

Results and Findings:
Energy intake of the study participants (1787 kcal/day) is mostly from carbohydrates (295 g/day = 66% of total energy intake). Protein and fat contribute 12% and 22% to total energy intake, respectively. Total dietary fiber intake (14.08 g/day) is mostly from the consumption of cereals and products and fruits. The gut microbiota of the study participants is dominated by members of the Bacteroidetes (48%) and Firmicutes (39%) phyla, with lower amounts of Actinobacteria and Proteobacteria. Phylum-level analysis suggested that carbohydrate and dietary fiber positively correlated with Bacteroidetes, but negatively associated with protein and fat. Actinobacteria positively correlated with carbohydrate, protein, fat and dietary fiber. Firmicutes positively correlated only with fat.

Conclusion and Recommendations:
Participants’ diet is characterized by high intakes of carbohydrates and dietary fiber, and their gut microbiota is dominated by species belonging to Bacteroidetes and Firmicutes. Findings indicate the role of diet in the gut microbial composition of selected Filipino children. Further research is needed to understand its role in shaping the gut microbiota of different Filipino population groups and geographical location, and consequential impacts on health and nutritional status.