

# Features of intestinal microbiota of young adults born by C-section

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## Features of intestinal microbiota of young adults born by C-section

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**【Purpose】** Intestinal microbiota development commences immediately after birth. The frequency of caesarean delivery is increasing worldwide. Caesarean-born infants may harbor a different microbiota as compared to vaginally-born infants, mainly due to evaded contact with maternal vaginal/fecal microbiota and an extended stay in the hospital. Such differences may influence whole-of-life health, but it is unclear how long-lasting these differences in the microbiota can be. In this context, we aimed to assess the intestinal microbiota of healthy Japanese young adults, profiled by the mode of delivery.

**【Methods】** The study included healthy young adults ( $n$  165; M 114; F 51; age:  $18.8 \pm 0.9$  years; age range: 18-22 years) enrolled as students at Juntendo University Faculty of Health and Sports Science, Chiba. Fecal samples ( $\approx 1.0$  g) were collected into fecal collection tube containing RNA<sub>later</sub> and an empty tube, and were stored at 4°C until nucleic acid extraction. Bacterial groups, subgroups and genera were quantified by RT-qPCR. *C. perfringens* was quantified by qPCR targeting  $\alpha$ -toxin and enterotoxin genes. Written informed consent was obtained from subjects and the study was approved by the ethics committee of the university.

**【Results】** Sixteen subjects had been delivered by C-section and 133 by vaginal delivery. We observed significantly higher detection rate of *Bacteroides fragilis* group and *Lactobacillus sakei* subgroup in vaginally-delivered subjects compared with caesarean-born subjects ( $p < 0.05$ ). The detection rate of fecal propionic acid was also significantly higher ( $p < 0.05$ ) in normally-delivered subjects compared to caesarean group. No differences were observed in the count or carriage rate of other fecal bacteria or organic acids.

**【Conclusions】** These results indicate that the differences in the acquisition and establishment of neonatal intestinal microbiota following C-section delivery may persist even after teenage. Given that the subjects in our study were sports students who are particularly disciplined in terms of diet, health and physical activities, the results of their microbiota might vary from other populations/groups. Hence, further studies are warranted to ascertain these differences in different populations of different ages, and to decipher the association, if any, of these differences with important health parameters.