

Nutritional Modulation of Gut Microbiota Alleviates Severe Gastrointestinal Symptoms in a Patient with Post-Acute COVID-19 Syndrome

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Case Description: With the increase in total coronavirus disease 2019 (COVID-19) infection cases, post-acute COVID-19 syndrome, defined as experiencing ongoing health problems 4 or more weeks after the first severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection, has become a new arising public health concern. As part of post-acute COVID-19 syndrome, gastrointestinal symptoms might be associated with dysbiosis of the gut microbiota, which has the potential to become a target for intervention. In this study, a patient with post-acute COVID-19 syndrome with long-lasting severe gastrointestinal symptoms was provided 2-month expanded access to a high-fiber formula with investigational new drug (IND) status developed to alleviate COVID-19-related symptoms by modulating the gut microbiota. Symptoms including severe “loss of appetite,” palpitation, and anxiety were significantly alleviated by the end of the intervention. The medication dosage for controlling nausea decreased during the intervention. The serum lipid profile, insulin level, and leptin level were improved compared to the baseline values. Significant structural changes of the patient’s gut microbiota and reduced microbial fermentation activity in the small intestine were found during the intervention. Eighteen amplicon sequence variants (ASVs) of the V4 region of the 16S rRNA gene significantly responded to this nutritional intervention. Six out of the 18 ASVs were also found to be negatively correlated with symptom severity/medication dosage. Five of the six ASVs (ASV0AKS_*Oscillibacter*, ASV009F_*Anaerofustis*, ASV02YT_*Blautia*, ASV07LA_*Blautia*, and ASV0AM6_*Eubacterium hallii*) were potential short-chain fatty acid (SCFA)-producing bacteria, which might be associated with the alleviation of symptoms. Our study indicates the feasibility of alleviating gastrointestinal symptoms in patients with post-acute COVID-19 syndrome by way of nutritional modulation of their gut microbiota.