1. No.

   2020T001

2. Title

   Role of Microbiota-Gut-Brain Axis in Pathology of Eating Disorders

3. Period

   2020-2024

4. Summary

[Background]

Among eating disorders, it is not uncommon for patients with anorexia nervosa (AN) to die. Therefore, the roles of intestinal bacteria and their metabolites, the intestinal environment, and the brain in the pathogenesis of AN are still awaited. In addition, new treatment methods for AN by improving intestinal bacteria and intestinal environment are expected.

[Aims]

1) To investigate the effects of decreased tryptophan (Trp) and tyrosine (Tyr) intake on behavioral characteristics and intestinal bacteria, which were decreased in AN patients.
2) To examine the effects of histamine-producing bacteria on host behavioral characteristics and brain monoamine levels.
3) To examine the association between changes in body weight and changes in gut microbiota in AN patients one year after the start of treatment.
4) To evaluate the role of nicotine on intestinal permeability, we will examine changes in behavioral characteristics and intestinal permeability when nicotine is administered.

[Results and Discussion]

1) Prolonged Trp, Tyr, and phenylalanine (Phe) deprivation induced a decrease in monoamines and their metabolites in specific brain regions. These changes in the monoamine system may contribute to increased locomotor activity.
2) Sustained oral administration of histamine-producing bacteria and histidine reduced compulsive anxiety-like behavior and altered monoamines in the brain.
3) Dysbiosis of the gut microbiota in AN patients was not easily reversed by weight gain alone.
4) No significant changes in behavioral characteristics or intestinal permeability were observed with nicotine administration. Future optimization of nicotine doses and delivery methods is needed.