

## Gut-brain axis in migraine pathogenesis: with a special focus on the effects of dietary modulation

**Zeinab Ghorbani**

*Cardiovascular Diseases Research Center, Department of Cardiology, Heshmat Hospital, School of Medicine, Guilan University of Medical Sciences, Rasht, Iran.*

*Department of Clinical Nutrition, School of Medicine, Guilan University of Medical Sciences, Rasht, Iran.*



**Background:** Considering the high health burden of migraine, several underlying mechanisms are suggested to be involved in its pathogenesis, though the exact mechanism remained uncertain. Gut-brain axis roles have been recently taken into consideration. The present review aims at discussing recent evidence on migraine and gastrointestinal (GI) disorders, and the role of the gut-brain with a special focus on the effects of dietary modulations.

**Methods:** A comprehensive literature review was performed from the inception to September 8, 2022.

**Results:** Current knowledge showed migraine in patients with *Helicobacter Pylori* might be improved following the bacteria eradication. The concurrent celiac disease should be particularly searched in migraineurs with occipital and parietooccipital calcification at brain neuroimaging. Migraineurs with long headache history and high headache frequency are diagnosed more often with irritable bowel syndrome. The roles of serotonin pathway and neuropeptides including glutamate, neuropeptide-Y and cholecystokinin in migraine in addition to gut microbiota composition and dysbiosis could explain these associations. Two mechanisms may be involved, indirect signaling, including microbiota-derived neurotransmitters, inflammatory molecules, and hormones, and direct connection with stimulating end terminals of the vagus nerve. Hence, taking into account the need for some interventions that modify dysbiosis, regular intake of fiber, supplementation with probiotics, vitamin D, and omega 3, adhering to low-glycemic-index-diets, institution of gluten-free diets, and weight loss could lead to improvements in migraine associated features.

**Conclusion:** Considering the close link between migraine and GI disorders, possibly through gut-brain associated factors, it was proposed that dietary interventions modulating gut microbiota may have promising effects in migraine prophylaxis.