- Digestion

Foggy brain? Maybe it's your gut

The gut-brain axis has been shown to play a big role in metabolism, disease prevention and more

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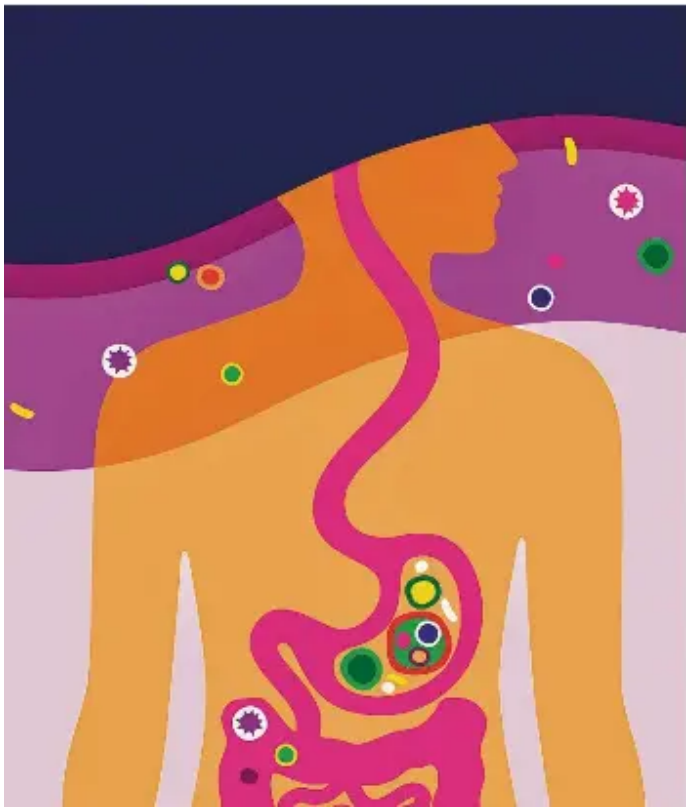
NEW YORK – Dr Kyle Staller is a gastroenterologist, so it may be surprising that many of his patients come to him complaining not only about stomach trouble, but also their brains.



Irritable bowel syndrome and other digestive dysfunction can be accompanied by a mental haze. People experiencing constipation and bloating, for example, may describe "a sense of heaviness or being weighed down both physically and mentally", said Dr Staller, who works at Massachusetts General Hospital in Boston.

"So many of my patients talk about problems like fatigue and brain fog, as well as feeling sluggish," he added.

Scientists are making progress in understanding how the pathway between the brain and digestive system influences a person's overall health. They call it the gut-brain axis, and it has been shown to play a big role in immune system support, anxiety, depression, metabolism and disease prevention. It can also affect mental clarity.

Here is what you need to know about the gut and brain fog.

There are thousands of fibres running from the brain to the abdomen that are known as the vagus nerve. It is a primary conduit of the gut-brain axis. And as the main nerve of the parasympathetic nervous system, it helps the body rest, digest and deter inflammation.

Signals also travel back and forth between the gut and brain via stress hormones and immune cells. Crucially, gut bacteria produce chemical messengers (called neurotransmitters) such as

serotonin, dopamine and gamma-aminobutyric acid that affect the nervous system. When they enter the bloodstream or stimulate the vagus nerve, they can help improve mood, drive motivation and calm the nervous system.

This constant communication keeps the body's systems in balance.

Brain fog is the result of "bad connections" between the gut and the brain, said Professor Gerard Clarke, who studies the effects of gut bacteria on the brain and behaviour. He is from the department of psychiatry and neurobehavioural science at University College Cork in Ireland.

Some causes of digestive problems are also associated with brain fog, including poor nutrition, hormonal changes associated with menopause, anxiety and infection.

Autonomic nervous system dysfunction, an umbrella term for various disorders that make it difficult for the body to control heart rate, blood pressure and temperature, can cause digestive problems and brain fog too, Dr Staller said.

It is not entirely clear how digestive dysfunction leads to brain fog. For some people with digestive problems such as irritable bowel syndrome, the nerves in the gut become increasingly sensitive. As the gut sends distress signals to the brain, these alerts intensify.

The gut microbiome is composed of trillions of bacteria, viruses and fungi that inhabit the intestinal tract. A diverse microbiome helps protect a person from disease, decrease inflammation, and help produce and regulate the neurotransmitters that affect his or her mood and brain function.

Signals from microbes can affect many of the brain regions associated with fogginess, Prof Clarke said. These include the hippocampus, which is responsible for learning and memory; the prefrontal cortex, which is associated with decision-making and clarity of thought; and the amygdala, which is the brain's central hub for processing fear and anxiety.

Sometimes, the experts said, the microbiome gets out of whack because of problems related to diet, stress, lack of sleep or exercise, medications, menopause, infection or chronic inflammation.

One type of imbalance in the gut's microbial community is small intestinal bacterial overgrowth (SIBO), which can cause bloating and diarrhoea.

In a small 2018 study of about 40 people, researchers found a connection between brain fogginess and SIBO among patients who were taking probiotics. Patients' symptoms improved after they took antibiotics and stopped probiotics.

Rather than colonising in the colon, the probiotics instead congregated in the small bowel and produced too much d-lactic acid, which is difficult for humans to metabolise, said Dr Satish Rao, a gastroenterologist and professor of medicine at Augusta University in Georgia. He was the lead author of the paper. "When it accumulates, you become foggy," he added.

Some people assume that taking probiotics is helpful for digestion, especially after a course of antibiotics. While probiotics have been shown to help in certain contexts, there is not enough scientific evidence to support widespread use, the experts said.

Scientists have not uncovered a specific way to target brain fog via the gut, but working to maintain a healthy gut can support a clearer mind.

To do this, eat healthy foods that support your gut microbes, Prof Clarke said. Microbes rely on fibre as an important source of nutrients, so try foods that are rich in fibre such as vegetables,

beans, nuts and whole grains. It also helps to add more fermented foods to your diet, like yogurt, kefir, sauerkraut and kimchi.

Psychologist Megan Riehl, who is from the University of Michigan and specialises in gastrointestinal disorders and other digestive conditions, suggested also getting enough sleep, doing moderate exercise and trying a "gentle diet clean-up", for example limiting your consumption of caffeine, alcohol and low-fibre, ultraprocessed foods.

Dr Staller also endorsed good nutrition. He said: "Healthy, plantbased diets will likely continue to show benefit and stand the test of time over the fads that come and go."