

Stress and the gut microbiome



Information brought to you by Eve Kalinik



Chronic stress can be viewed as one of the key contributing factors in the development (and potential cause) of countless modern diseases. This can include those related to the gut. In conditions like IBS for example, digestive symptoms often present alongside such things as heightened stress and anxiety. In general, the effects of stress can have a pronounced effect on the health of the gut microbiome.

HPA axis and the gut

The gut and the brain communicate in various ways including via the neuroendocrine system and HPA (hypothalamus-pituitary-adrenal) axis. Upon exposure to a stressor the hypothalamus activates hormones such as noradrenalin and cortisol to prompt the sympathetic nervous system, alerting the pituitary and adrenal glands. This, as we know, is part of a healthy acute stress response.

However, chronic stress and the over-activation of cortisol and noradrenalin can increase the permeability of the gut barrier and alter the composition of the gut microbiota. Furthermore, this increased intestinal permeability can lead to low-grade chronic inflammation. This is often due to circulating bacterial endotoxins, such as lipopolysaccharides (LPS) as well as pro-inflammatory cytokines as a result of a compromised gut barrier. The possibility is that this has the potential to escalate inflammation in the gut as well as overall inflammation in the body, including the brain. Chronic inflammation has therefore become associated with certain cognitive conditions, including those related to stress such as anxiety disorders. As the gut becomes increasingly more permeable, more cortisol, noradrenalin and inflammatory signals are released, further compromising both gut microbiota and gut barrier function.

Chronic release of cortisol and noradrenalin can also change intestinal secretions and alter gut acidity levels, making it a less hospitable environment for beneficial bacteria to live and thrive in. This can also contribute to a state of dysbiosis in the gut microbiota, which can then feed back into this loop.

Stress-less menu

At the heart of a gut-focused menu we need to consider supporting and nourishing the gut microbiota with its favourite flavours. Now of course this will vary depending on the individual and their symptoms. For example, patients with IBS that are following FODMAP diets, or those that have food allergies or potential food intolerances may need to adapt for their personal circumstances. It isn't a one size fits all. However, there are foods and food groups we can consider broadly and then tailor to meet patient needs...

Dietary fibre

Myriad sources of dietary fibre (where possible), with diversity in the colour and types of vegetables, fruit, wholegrains, nuts and seeds. This provides the preferred 'food' for our gut microbiota to create diversity and to support the production of substances such as butyrate.

Fermented foods

Such as 'live' yogurts, kefir, cheese, sauerkraut and kimchi. These may bring in additional beneficial microbes for the gut.

Omega 3s

Oily fish provide an excellent dietary source. Foods that are rich in omega-3 essential fatty acids also have a fundamental role in managing stress, both by supporting brain function and in their general anti-inflammatory effect.

Vitamin C

Is a key component in the production of all adrenal hormones, and can be used rapidly during periods of stress. It also supports the production of collagen, which helps to maintain healthy connective tissue, including that of the gut barrier. Good sources include broccoli, cauliflower, peppers and strawberries.

Pantothenic acid

Or vitamin B5 is a key nutrient for the adrenal glands. Sunflower seeds are an excellent source, as are avocados. Organic chicken liver is also rich in B5 and contains many other B vitamins, iron and vitamin A. These can all benefit the gut and the adrenals.

Magnesium

Is a mineral that is readily depleted during stressful periods – leafy greens, legumes, nuts & seeds all provide good dietary sources.

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Rest and digest

Food aside, one of the most basic things to help manage stress from a nutrition perspective is encouraging everyone to consider meal times as dedicated and mindful moments in the day. Meal times should be seen as mini pockets of recovery, taking time to sit, eat and chew, rather than eating on the go with multiple electronic devices. Using meal times as opportunities to get some time out helps to de-stress.

Diaphragmatic breathing is also a technique that can help to support the gut-brain connection and can be incorporated into a stress-gut protocol to help maintain overall cerebral equilibrium.

...and relax

For all of us, managing stress from a microbiota-gut-brain perspective requires nourishing both the mind and gut microbiota. Encouraging some kind of daily mindfulness practice such as meditation or deep breathing alongside enriching the thriving existence of the gut microbiota can help support the bi-directional gut-brain connection and its role in stress.

And to finish, a gentle reminder to focus and encourage more attention on, and with, the things, people and situations that provide us with the greatest satisfaction. As Hans Selye, the scientist who conducted pioneering research into the effects of stress, said, 'It's not stress that kills us, it is our reaction to it.' Taking heed from this to take life at a slower pace, being less 'busy' and focusing on the good can bring about a greater sense of calm for the mind and the gut microbiome.

