Medical Xpress

Throat problems could impair autonomic nervous system's ability to regulate blood pressure

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Patients with throat problems were less able to regulate their blood pressure in a new study led by the University of Southampton.

The study, published in *JAMA Otolaryngology–Head & Neck Surgery*, is the first to observe reduced baroreflex sensitivity in patients with throat symptoms. The paper is titled "Baroreflex Sensitivity in Patients With Laryngopharyngeal Dysfunction—The Overwhelmed Vagus

Hypothesis."

The baroreflex is a crucial part of the autonomic nervous system which detects changes in blood pressure and adjusts our heart rate and blood vessel tone accordingly to maintain stable blood pressure. It is what stops us from fainting when we stand up.

Researchers from the University of Southampton and University Hospitals of Dorset Foundation Trust believe the findings could be explained by the Vagas nerve (which controls the autonomic nervous system) prioritizing protection of the airways over less urgent functions, such as blood pressure regulation.

"Our immediate survival depends on the throat being able to separate air and food passages each time we swallow," says the lead author of the study Reza Nouraei, Professor of Laryngology and Clinical Informatics at the University of Southampton.

"The throat does this using delicate reflexes, but when these reflexes are disturbed, for example, due to a viral infection like COVID or exposure to reflux affecting nerves in this region, the control of this critical junction becomes compromised, giving rise to symptoms like the feeling of a lump in the throat, throat clearing and coughing.

"To compensate for a faulty throat, the autonomic control system must expend significant amounts of energy to maintain a safe airway. We found that in patients with a faulty throat, the heart, specifically a function called baroreflex, is less well controlled. This is one of the Peters that has been robbed to pay Paul.

"The problem with robbing this Peter is that it likely impacts long-term survival, as patients with reduced baroreflex function are more likely to die of a heart attack or stroke in years to come."

The researchers compared the heart rates, blood pressure and baroreflex sensitivity of 23 patients admitted to Ear, Nose and Throat (ENT) surgery with aerodigestive (laryngopharyngeal) symptoms and 30 patients admitted to Gastroenterology with digestive (esophagogastric) symptoms at University Hospitals of Dorset NHS Foundation Trust.

Reflux was a common cause of symptoms in both groups—making up the majority of digestive group cases. Other causes like thinning of the vocal cord were present in the aerodigestive group.

The team found patients in the aerodigestive group had a higher resting heart rate, lower resting blood pressure, and lower baroreflex sensitivity, than those in the digestive group.

"Now, and especially since COVID which damages nerves, we are seeing more patients with throat symptoms," says Professor Nouraei.

"Reduced baroreflex sensitivity impacts survival independent of other cardiovascular risks, so if the association we've discovered is confirmed by future studies, the need to make timely and accurate diagnoses and provide early and definitive treatments will become more pressing."

The study adds to the increasing interest in the Vaus nerve and holistic health. As well as regulating blood pressure through the baroreflex, the Vagus nerve controls our heart rate, digestion, respiration, mood and a host of other bodily functions which affect our health and well-being.

Professor Nouraei says, "This study helps us to think about patients more holistically. As a clinician, if you can fix a problem in the throat that is potentially taking away bandwidth from the Vagus, then it frees up the nerve to give to the rest of the body.

"If there is a chance that throat problems can affect functions like the

baroreflex, or have a wider impact on overall well-being, then they need more consideration."

The researchers will now look at the long-term impacts of throat conditions on autonomic health and the effects of treatment.

More information: S. A. Reza Nouraei et al, Baroreflex Sensitivity in Patients With Laryngopharyngeal Dysfunction—The Overwhelmed Vagus Hypothesis, *JAMA Otolaryngology–Head & Neck Surgery* (2024). DOI: 10.1001/jamaoto.2024.2270

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