GASTRO

Elective Report

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Effect of physiological and psychological modulation of the autonomic nervous system on human oesophageal pain hypersensitivity.

One of the commonest symptoms reported by patients suffering from gastrointestinal disorders is abdominal pain. Pain is reported across the spectrum of different gastrointestinal disorders, and in some of these conditions, there is no cause found. These are termed to be 'functional gastrointestinal disorders' (FGID). In part, they are thought to be caused by increased gut sensitivity to certain noxious stimuli as well as increased mechanical stretching. This is called Visceral Pain Hypersensitivity (VPH). This study involves experimentally introducing acid into the oesophagus (gullet) of healthy volunteers in order to study why some people sensitize more to acid than others. One factor thought to affect the response of this gut activity is a part of the nervous system called the Autonomic Nervous System (ANS). The ANS is divided into the sympathetic and parasympathetic nervous systems, the former controlling the bodies 'fight or flight' response and the latter controlling the 'rest and relax' response. Altering the activities of these two systems, could potentially affect the degree of VPH in this model. ANS activities would be modulated using behavioural interventions such as psychological stress, exercise or deep breathing, could affect the degree of VPH in the model. If this concept is proven, the next step will be to use drugs in a similar way.

The fundamental research question for this study was:

- Does physiological modulation of the Autonomic Nervous System (ANS) influence the degree of oesophageal pain hypersensitivity?

Through the course of this experiment I was responsible for monitoring the activities of the autonomic nervous system. ECG monitoring, blood pressure, galvanic skin response and the heart's beat to beat variability were all monitored and assessed. Finapress was used to assess blood pressure and heart rate. Subjects wore a cuff that was self inflating and contained a photosensitive cell connected to a servo-controlled pump which ensured that the cuff was able to maintain a constant pressure. The subject's hand was held still, approximately at the level of the precordium.

The patients were also connected to the Neuroscope to assess the level of activation within the nervous system. In this case, the parasympathetic efferent was the beat-to-beat cardiac vagal tone, and the cardiac sensitivity to the baroreflex acted as the parasympathetic afferent. Galvanic skin response and blood pressure (sympathetic efferent) were also assessed. By gathering data on factors such as arterial blood pressure and heart rate, the Neuroscope both quantifies and records the cardiorespiratory functions of the brainstem through the course of the experiment.