Cardiovascular Risk and the Autonomic Nervous System

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Abstract

Involuntary bodily processes including heart rate, blood pressure, skin muscle activity, and gastrointestinal processes are all controlled by the autonomic nervous system. Strong evidence from the literature suggests that autonomic dysfunction may increase the risk of cardiovascular disease. In light of this, this Research Topic examines current research that looked at the connection between cardiovascular risk and the autonomic nervous system.

Keywords: Sleep Alertness

Introduction

The work of Abdalbari, which used Granger Causality to record brain-heart processes during waking and sleep, was the first publication published in this Research Subject. A statistical technique called Granger Causality can also be used to gauge EEG bidirectional connection. EEG and ECG were recorded in the Abdalbari investigation throughout various periods of sleep and alertness.

The authors used Granger Causality to show the importance of fronto-posterior connection during waking and sleep stages as the primary data. The study also uncovered bidirectional brain-heart connections that are stronger from the brain to the heart and revealed variations in ipsilateral and contralateral pathways.

Liu Y also assessed the relationship between the brain and the heart. These scientists examined how dobutamine, a sympathomimetic medicine often used to treat heart failure, altered the brain's spontaneous function, which is connected to autonomic function, during changes in the cardiovascular system caused by the drug (alpha-1, beta-1, and beta-2 agonist drug). Cognitive performance was unchanged in young, healthy volunteers when blood pressure and heart rate rose after dobutamine treatment. Yet, following a dobutamine infusion, spontaneous brain activity was altered. Moreover, the degree of unplanned brain activity.

The Vasovagal Syncope (VVS), also known as neuro cardiogenic syncope or reflex syncope, is a condition that is being researched all over the world in this context. Li's information on the Calcitonin Gene-Related Peptide (CGRP) and its connection to VVS was fascinating. The CGRP is a peptide that is found in the C and A sensory fibers and has a significant role in both sensory and efferent function. It has a wide perivascular distribution throughout the body and a broad innervation. Li studied the plasma levels of CGRP in VVS patients and healthy kids. Their findings showed that VVS children had considerably higher plasma CGRP concentrations. Moreover, correlation analysis demonstrated a favorable link between CGRP and the intensity of clinical symptoms, showing that CGRP levels predicted therapy success.

Cai performed an analysis of symptomatic vagal-induced sinus node dysfunction in relation to the vagus nerve. In order to determine the best candidate for cardio neuroablation, a treatment option for sinus dysfunction, neuro cardiogenic syncope, and functional atrioventricular block—the study highlighted a variety of criteria. The researchers emphasized sinus node dysfunction with vagal over activity, cardiac autonomic nervous system processes, and cardio neuroablation as a potential novel therapy for refractory symptomatic sinus node dysfunction. Nonetheless, the evaluation confirmed that the majority of the research provided poor quality evidence.

To explore the estimative value of heart rate variability for stroke course, functional outcome, and medical consequences, Aftyka carried out a systematic review. In this situation, a non-invasive tool for estimating heart rhythm autonomic control is heart rate variability. Reduced heart rate variability is a sign of defective adaptation of the autonomic nervous system, whereas increased heart rate variability is connected to excellent adaptation, i.e., healthy persons with effective autonomic systems. 1,305 possible references were discovered during the initial search. 36 researches that looked at linear and non-linear heart rate variability were included after strict exclusion criteria based on the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) technique were used. The systematic study found after meticulous quality assessment and risk of bias assessment that heart rate

The systematic review came to the conclusion that heart rate variability may be the best predictor of stroke outcomes and complications after carefully evaluating the quality and risk of bias. The authors did, however, highlight specific methodological aspects to effectively assess and interpret the heart rate variability indices.

Liu J. et al. released another study on heart rate variability in this Research Subject. The study looked at how heart rate variability in individuals with cervical cancer was affected by taxane in combination with carboplatin, anti neoplastics, cardiotoxic medicines, and Guijosa. The patients were split into two groups, one of whom received paclitaxel plus carboplatin and the other of whom received docetaxel plus carboplatin. Standard deviation of normal-to-normal intervals and the root mean square of consecutive differences were used to examine short-term heart rate variability.