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Neural Circuits-Adjusted Diagnostic Approach to Predict Recurrence of Atrial Fibrillation

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Abstract

Recently the high informational input on individuals of modern society is a real challenge for the capacity of the central nervous system. It has to overcome not just the big data amount, but also a state of permanent hyperactivity due to informationally-induced neuronal circuits, including artificially-induced neural circuits, originating from advertising and directed informational streams. Pathologically hyperactivated interconnectivity of the neural circuits leads to a permanently increased central component of heart rhythm modulation leading to favorable conditions for atrial fibrillation recurrence in patients with paroxysmal atrial fibrillation. Two new parameters of cardiogram analysis – low-frequency (LF) drops and high-frequency (HF) counter-regulation are dynamic indicators for the intensity of affection of the heart rhythm regulation by the pathological hyperactivity of the central nervous system. Here we show in the case-series study of 350 cardiograms of patients with paroxysmal atrial fibrillation, that the LF drops and HF counter-regulation are sensitive biomarkers to predict the onset of recurrence of atrial fibrillation. The hyperactivity of the central nervous system leads to atrial fibrillation onset. The increased centrally-driven heart rhythm modulation can be visualized on cardiograms by the feature LF drops. The capacity of the vegetative nervous system to compensate for this state in order to maintain normal sinus heart rhythm can be assessed by the HF counter-regulation. The features HF counter-regulation and LF drops reflect the answer of the heart regulation to the neuronal circuits-induced central hyperactivation and can be evaluated in the



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cardiorhythmograms for the prediction of atrial fibrillation recurrence in patients with paroxysmal atrial fibrillation.

Keywords: atrial fibrillation, recurrence, prediction, cardiorhythmogram, neuronal circuits, heart regulation

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