عنوان مقاله:

A Review of Excitation-Inhibition Balance in the Nucleus Tractus Solitarius as a Gateway to Neural Cardiovascular Regulation

محل انتشار:

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خلاصه مقاله:

Physiological experiments show that mean blood pressure is controlled by the nervous system in long-term. The nucleus tractus solitarius (NTS), located in the dorsomedial medulla oblongata is extensively recognized as an essential brain area complicated in the integration of numerous viscerosensory processes, such as respiratory, cardiovascular, hepatic gustatory, and renal regulation mechanisms. NTS is a region of the brain stem in which primary baroreceptor afferents terminate and synapse with the rostral ventrolateral medulla (RVLM) via a nitric oxidergic pathway and hence is vital in the normal control of arterial pressure (AP). The NTS as a comparator evaluates the error signals between afferents of cardiovascular receptor and central neural structures and sends signals to nuclei that normalize the circulatory variables. Furthermore, during exercise, signals from the muscle receptors reach the NTS that activate sympathetic premotor neurons and thus cause pressor and tachycardiac responses. The GABAergic interneurons of NTS may contribute to baroreceptor reflex resetting by the inhibition of the barosensitive NTS neurons, thereby enhancing the sympathetic nerve activity. The basic functions of the NTS with respect to regulating the cardiovascular system are introduced in this review. Then, the potential mechanisms underlying cardiovascular regulation are discussed with a focus on NTS functions.

کلمات کلیدی:

Cardiovascular system, GABA, Glutamate, Nitric oxide, Nucleus tractus solitarius