

Proinflammatory Cytokines in the Nucleus of the Solitary Tract of Hypertensive Rats Exposed to Chronic Intermittent Hypoxia

Oyarce, M. P., & Iturriaga, R. (2018). Proinflammatory cytokines in the nucleus of the solitary tract of hypertensive rats exposed to chronic intermittent hypoxia. In *Arterial Chemoreceptors* (pp. 69-74). Springer, Cham. <10.1007/978-3-319-91137-3_8> Accessed 10 Nov 2020.

Abstract

Obstructive sleep apnea (OSA) is characterized by chronic intermittent hypoxia (CIH), which is considered the main factor for developing hypertension. Sympathetic overflow, oxidative stress and inflammation have been associated with the CIH-induced hypertension. In rats exposed to CIH mimicking OSA, intermittent hypoxia enhanced carotid body (CB) chemosensory discharge, leading to an increase in arterial blood pressure in 3–5 days. In addition, CIH increases the CB levels of proinflammatory cytokines IL-1 β , IL-6 and TNF- α in the CB. Proinflammatory molecules have been also involved in neurogenic hypertension acting on brain cardiovascular centers, like the nucleus of the solitary tract (NTS), which is the primary site for afferent CB inputs. Accordingly, we aim to study if proinflammatory cytokines in the NTS may play a role in the hypertension induced by CIH. Male Sprague-Dawley rats 250 g were exposed to CIH (5% O₂, 12 times/h, 8 h/day) for 7–28 days. Brains were removed and processed to measure IL-1 β , IL-6 and TNF- α in the NTS using qPCR and immunofluorescence. The mRNA levels were significantly augmented in the NTS of rats exposed during 21 days to CIH compared with control animals. In addition, a significant increase of IL-1 β , IL-6 and TNF- α immunofluorescence was found in the NTS at day 28 of CIH exposure compared with control rats. Present results suggest that proinflammatory cytokines in the NTS may contribute to the maintenance of hypertension in CIH-exposed animals.

Keywords

Obstructive sleep apnea, Carotid body, Intermittent hypoxia, Proinflammatory cytokines, Nucleus of the tractus solitary, Hypertension.