



Sympathetic nervous activation and hypertension

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Sympathetic nervous activation is closely related to hypertension. In this month's Asian Special Issue of *Hypertension Research*, the association between sympathetic nervous activation-related diseases and hypertension is reported.

Asthma has been reported to be the risk of hypertension partly due to sympathetic activation [1]. In addition, beta-stimulants, which are often used in the treatment of asthma, may increase blood pressure. Lee et al. reported that the history of asthma was associated with an increased risk of all-cause mortality and myocardial infarction incidence in hypertensive Korean patients from the data of the National Health Insurance Service-Health Screening Cohort [2]. This study also showed that the use of long-acting β_2 -agonist (LABA) inhalers had higher risk of all-cause mortality, myocardial infarction and end-stage renal disease. Sympathetic nervous activity has been reported to provide hyperuricemia and activate its precursors, i.e., hypoxanthine and xanthine. This association provides a vicious cycle in which each compound reinforces the other, leading to detrimental effects on the cardiovascular system [3]. Kochi et al. investigated the impact of hyperuricemia for the association between blood pressure and the prevalence of proteinuria in Japanese general population [4]. This association was more pronounced in participants with hyperuricemia than those without. Thus, the status of hyperuricemia may be result in sympathetic nervous activation, which may lead to accelerated hypertensive related organ damage. Hyperinsulinemia/insulin resistance activates the sympathetic nervous system, which

increase blood pressure due to increasing vascular resistance and cardiac output [5]. Li et al. reported that several biomarkers related to insulin resistance such as leptin, adiponectin, Retinol-binding protein 4 (RBP4) and Fibroblast growth factor 21 (FGF21), might be associated with hypertension in Chinese youth [6].

What is the useful treatment for sympathetic nervous activation? Recent paper reported that hot water bath decreased sympathetic nervous activity [7]. Wang et al. added the further evidence to this topic [8]. In summer season, hot water bath increased heart rate, cardiac output, and left ventricular dP/dt Max, while in winter season hot water bath extremely decreased blood pressure. In that study, the temperature of hot water bath was at about 38–40 °C, and the participants were immersed in a sitting posture to the chest level for 20 m. Although hot water bath may be generally beneficial for the prevention of cardiovascular disease, hemodynamic change according to the season need to be considered.

In this issue, two papers related to home blood pressure monitoring in Asian population has been reported [9, 10]. Hypertension Research addresses home blood pressure monitoring as another topic “Home Blood Pressure-Centered Management of Hypertension”. Please see the following website: <https://www.nature.com/hr/call-for-paper>.

Compliance with ethical standards

Conflict of interest The authors declare no competing interests.

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