

International Conference on Diabetes and Endocrinology (ICDE-2025)

Conference Proceeding

May 08, 2025 (Virtual)

The Relationship Between Blood Pressure Salt Sensitivity and Metabolic Syndrome

Jihong Hu

Professor in Preventive Medicine and Epidemiology and Health Statistics, Ningxia Medical University and Peking Union Medical College, China

Blood pressure salt sensitivity (BPSS) is a physiological trait characterized by significant changes in blood pressure in response to dietary sodium intake. Emerging evidence suggests that BPSS is closely associated with metabolic abnormalities and may represent an early marker of cardiometabolic risk. This study explores the relationship between blood pressure salt sensitivity and metabolic syndrome (MetS), a cluster of conditions including central obesity, insulin resistance, dyslipidemia, and hypertension.

Salt-sensitive individuals often exhibit impaired renal sodium handling, endothelial dysfunction, heightened sympathetic nervous system activity, and activation of the renin–angiotensin–aldosterone system. These mechanisms overlap with the pathophysiological pathways underlying metabolic syndrome. Insulin resistance, a core feature of MetS, may enhance renal sodium reabsorption and contribute to increased vascular stiffness, thereby amplifying salt-induced blood pressure responses. Furthermore, chronic low-grade inflammation and oxidative stress—common in metabolic syndrome—may exacerbate vascular reactivity to sodium.

Clinical and epidemiological data indicate that individuals with metabolic syndrome are more likely to demonstrate salt sensitivity and are at higher risk of cardiovascular complications, including left ventricular hypertrophy, stroke, and chronic kidney disease. Identifying salt-sensitive phenotypes within patients with metabolic syndrome may facilitate personalized dietary sodium recommendations and targeted therapeutic interventions.

Understanding the interplay between BPSS and metabolic syndrome has significant implications for prevention strategies in diabetes and endocrinology practice. Early detection and lifestyle modification, particularly sodium restriction and weight management, may reduce long-term cardiometabolic morbidity and mortality.

Keywords: Blood pressure salt sensitivity, Metabolic syndrome, Insulin resistance, Hypertension, Sodium intake, Endothelial dysfunction, Cardiometabolic risk