Restless legs syndrome and hypertension: current status and possible links

Samson Khachatryan, MD, PhD
Center for Neurology and Sleep Medicine, Yerevan, Armenia

Restless legs syndrome (RLS) is a neurological disorder with a high prevalence in European countries that ranges from 5-15%. Its wide distribution in the general population and in some special populations (age, gender and several diseases) raises the possibility of a frequent co-morbidity with other prevalent disorders. This co-morbidity could either be incidental, due to the high prevalence of both disorders, or related to intrinsic mechanisms that links the conditions together. Recent observations that RLS is highly prevalent in cardiovascular disease, especially hypertension, has lead to concerns about possible causative links in both directions; reports on cardiovascular disease leading to RLS symptoms also support this hypothesis.

Research on RLS and hypertension is scarce and many hypotheses remain theoretical and in need for confirmation. There are emerging views on how RLS could be a potential cardiovascular risk factor leading to or complicating hypertension. This issue attracts increasing attention as links to other systemic, and especially cardiovascular diseases, become more evident in the field of RLS research.

Several large-scale epidemiological studies have addressed the issue of linking RLS to cardiovascular disease and hypertension (Ulfberg et al. 2001, Ohayon and Roth 2001, Phillips et al. 2005, Winkelman et al. 2006 and 2008, Hogl et al. 2005, Rothdach et al. 2000). With other varying results, these studies point to a possible relationship between RLS and hypertension.

An interesting direction is to consider the role of periodic limb movements in sleep (PLMS) in involving sympathetic nervous system and potentially linking PLMS to hypertension. Existing scientific observations show susceptibility of blood pressure to PLMS. Studies by Pennestri et al. (2007) and Siddiqui et al. (2007) obviously point to essential blood pressure elevations accompanying PLMS events (especially, PLMS followed by microarousals) in patients with RLS.

Occurrence of PLMS in the hypertensive population is higher than in the general population (Espinar-Sierra et al. 1997, own unpublished data) and the opposite relationship is also observed, i.e. hypertension is more frequently seen in RLS population (Billars et al. 2007 abstract).

Other researchers have looked at cardiovascular risk factors as potential variables involved in this link. A recent study by Gao et al. (2009) shows a significant connection between obesity (a well-known risk factor for cardiovascular morbidity and other sleep disorders) and RLS. Although authors give more credit to the dopaminergic link between obesity and RLS, the cardiovascular pathway should also be considered to play an essential role. Schlesinger et al. (2009) studied the prevalence of cardiovascular risk factors in subjects with and without RLS. They found female gender, smoking and HDL/LDL cholesterol to be the most reliable factors associated with RLS.

A pathophysiological substrate for this link may be associated with the A11 dopaminergic diencephalospinal pathway, innervating preganglionic sympathetic neurons and the dorsal horn in the spinal cord. Hypothesized hypofunction of A11 neuronal group could be the best, if not only, link for the sympathetic hyperactivity and subsequent hypertension and other cardiovascular and cerebrovascular diseases.

Although controversial, further basic and clinical research on the possible links between RLS and hypertension could lead to important developments in the study of these prevalent conditions.