“Small Heart Syndrome” with Orthostatic Hypotension

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The patient was a 51-year-old man with orthostatic hypotension. He had no history of diabetes mellitus, chronic kidney disease, the use of beta-blockers or over-the-counter medications. Chest X-ray indicated a small heart with a cardiothoracic ratio of 33% (A). Transthoracic echocardiography showed a left ventricular mass index of 56.2 g/m² and cardiac output of 4.3 L/min (B). Although his blood pressure was 143/88 mmHg in the supine position, it declined to 57/34 mmHg after continuously standing for 1 minute (C). His endocrine workup showed severely suppressed plasma renin activity (PRA) and serum aldosterone (aldo) levels despite him being in an upright position; aldo secretion was responsive to rapid adrenocorticotropic (ACTH) stimulation (D). These results suggested that the function of the zona glomerulosa was preserved, while the renin-angiotensin-aldosterone system was suppressed. His symptoms were improved by wearing leg compression stockings and with the administration of oral fludrocortisone. “Small heart syndrome” is defined as a small heart shadow on chest X-ray with a cardiothoracic ratio of ≤42%, which indicates orthostatic intolerance (1). In such cases, the renin-aldosterone system is markedly downregulated despite a reduced cardiac output (2). Clinicians should be aware of small heart syndrome in patients with symptoms of orthostatic intolerance and hyporeninemic hypoaldosteronism.

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References


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