

Diastolic Dysfunction and its Therapy in Hypertension

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Editorial

Left Ventricular (LV) Diastolic Dysfunction (LVDD) is characterized by changes in LV diastolic fill and is a strong predictor of cardiovascular events and heart failure. In the general population, hypertension is the most common cause of LVDD, and it promotes it through a number of mechanisms, including hemodynamic overload and myocardial ischemia. In hypertensive patients, age, ethnicity, dietary salt, obesity, diabetes mellitus, and chronic renal illness are all factors that contribute to LVDD. Lowering blood pressure with antihypertensive medications can improve LVDD; however, it is unclear if this increase in LV diastolic function will enhance cardiac vasculature. Left Ventricular (LV) Diastolic Dysfunction (LVDD) is characterized by changes in LV diastolic filling and is a strong predictor of cardiovascular events and heart failure. Hypertension is the leading cause of LVDD in the general population, and it promotes it through a variety of mechanisms, including hemodynamic excess and myocardial infarction. (Age, ethnicity, dietary sodium, obesity, diabetes mellitus, and chronic renal disease are all factors that contribute to LVDD in hypertension patients.) Lowering blood pressure with antihypertensive medications can improve LVDD; however, it is unclear if this increase in LV diastolic function will enhance cardiac vasculature.

Abnormalities in left ventricular (LV) diastolic function in the presence of normal LV systolic performance are one of the early cardiac signs of systemic hypertension. Although age, body weight, blood pressure, left atrial size, LV systolic function, interstitial fibrosis, decreased coronary blood flow, and sympathetic stimulation all have a role in diastolic filling anomalies, these abnormalities have been seen more clearly in individuals with LV hypertrophy. Several investigations have suggested that, at least in part, impaired diastolic function contributes to a diminished LV systolic response to isotonic or isometric exercise. When administered for short or long periods of time, some antihypertensive medications, such as ACE inhibitors and calcium antagonists, especially those of the phenylalkylamine type, can significantly improve diastolic function. Inappropriate diastolic filling was significantly improved when LV mass was reduced by long-term hypertension treatment. LV mass remained low even after medication was withdrawn and blood pressure returned to normal. These results suggest that lowering LV mass may improve LV diastolic function on its own.

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More research is needed to establish if increasing LV diastolic function has an effect on long-term prognosis in patients with hype. Hypertension is the most common cause of heart failure, which is one of the leading causes of morbidity and mortality in the cardiovascular system. According to new research, isolated diastolic dysfunction is usually linked to hypertensive heart disease. In ventricular diastolic function, an active relaxation phase and a passive compliance period can be separated. The gold standards for diastolic function study are these two components, which have been investigated invasively. However, for measuring ventricular filling in a clinical setting, echocardiographic and Doppler procedures are the most useful. As a result, the examination of mitral flow E and A waves has given important and useful data. Unfortunately, there are just too many variables that influence these indices. New indices derived from ventricular time intervals, tissue Doppler imaging, and colour M-mode echocardiography have increased the ability to assess diastolic function. Furthermore, new imaging techniques such as MRI and cine Computed Tomography (cine CT) have increased our understanding of left ventricular filling in hypertension. These methods have revealed that diastolic dysfunction is common in hypertensive individuals, even before left ventricular hypertrophy is apparent and hypertension develops in young, normotensive male offspring of hypertensive parents.

In addition, myocardial ischemia and fibrosis have recently been discovered to be two important factors connected to diastolic dysfunction in hypertension. In half of hypertensive patients, diastolic dysfunction has been associated to an increased risk of cardiovascular morbidity and mortality, as well as the development of heart failure. Given the significant prevalence of hypertension and its repercussions, treating diastolic dysfunction in hypertension is an important and desirable goal. Angiotensin-converting enzyme inhibitors and angiotensin receptor blockers have been shown to improve diastolic function

and are recommended as first-line treatments for diastolic heart failure patients who have hypertension. Diuretics, beta-blockers,

and calcium channel blockers have all been shown to improve diastolic filling indices.