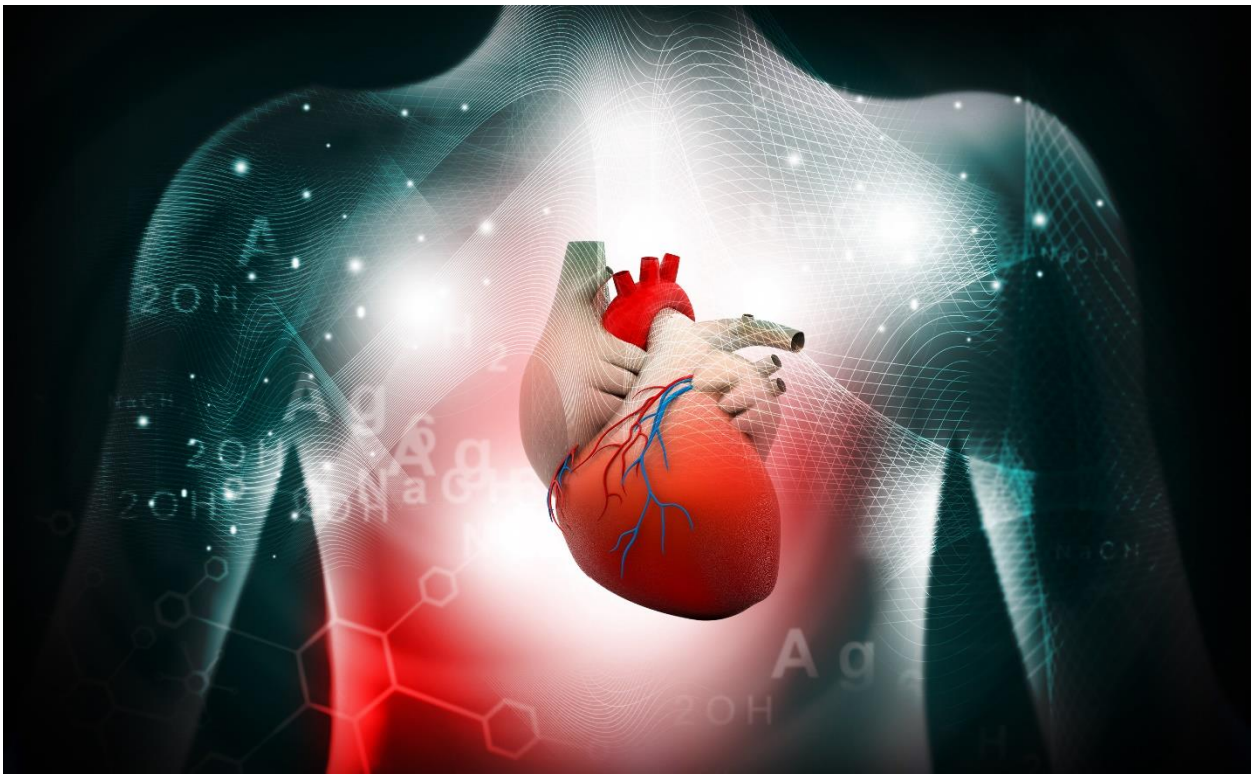
“Hypertension to heart failure”



Long-standing hypertension can lead to changes in the heart, which can lead to hypertensive heart diseases. Ultimately, hypertension can lead to heart failure. Most patients with heart failure have a history of hypertension.[1] So how does long-standing hypertension lead to heart failure?

Heart failure happens when the heart cannot efficiently pump blood to meet the body’s needs for nutrients and oxygen.[2] The heart is a muscular organ pump that works hard and nonstop to drive the circulation of the blood in our arteries and veins. The heart pumps out a certain amount of blood every time it beats, and this amount is controlled by three components: the volume of blood that actually gets back to the heart from the body (the preload), the ability of your heart to contract to push out that volume of blood (contractility), and the pressure it needs to overcome in order to get that volume out of its chambers and back to the body (the afterload).

When there is hypertension, there is an increase in the pressure that the heart needs to overcome to get the blood out of its chambers, so it needs to work harder to get the blood flowing. The heart compensates by increasing the other two components, particularly its contractility by producing more muscle cells to contract. The left ventricle of the heart needs to work harder to pump the oxygenated blood into the systemic circulation. As a result, like all muscles, this causes wear and tear of the myocardial muscle, and when there is an increase in the workload, the muscle tends to increase in size to accommodate that workload and increase its contractility (like skeletal

muscles of heavy-weight lifters). This leads to left ventricular hypertrophy. Over time, this muscular organ gets tired and there are certain changes that accumulate due to this extra work, which leads to hypertensive heart diseases and eventually heart failure.[1,3,4,5]

Left ventricular hypertrophy is the enlargement and thickening of the walls of the left ventricle. When the muscular wall of the left ventricle is thickened, it leads to this part of the heart losing its elasticity and the space inside the chamber is lessened. The elasticity of the heart is needed in order to accommodate the amount of blood that is coming back from the body to the heart. When there is decreased elasticity and space, it leads to increased pressure in the left ventricle, which then leads to the blood not being able to go to the left ventricle and less blood “to pump out”. Eventually, this will lead to diastolic dysfunction, which means that the left ventricle can no longer collect blood and fill up with blood in between beats, making its job less and less efficient. All of these constellations of effects of increased blood pressure lead to more hard work for the heart to pump out blood to maintain circulation and so on. Heart failure is a consequence of the hypertrophy of the left ventricle and diastolic dysfunction.[1,3,4,6]

There should be strict control of hypertension early on to prevent the structural and functional changes in the heart that can cause heart failure. Taking medications as advised by the doctor, lifestyle modifications such as staying physically active, eating healthy food, and maintaining a healthy weight should decrease your risk of worsening hypertension that can lead to heart failure.[3,7]

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MI Disclaimer: *This does not substitute the advice of your HCP*

References:

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