Progression of cardiac hypertrophy in dialysis patients can be slowed by drugs

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Patients with chronic kidney dysfunction frequently develop thickening of the heart muscle, so-called left ventricular hypertrophy. This is particularly pronounced in patients who are in the late stage of renal dysfunction, that is to say those requiring renal replacement therapy such as haemodialysis. The danger of this cardiac hypertrophy lies in the considerable associated increase in risk of acute cardiovascular disease, such as sudden cardiac death, for example. Haemodialysis patients have a number of risk factors for developing this form of cardiac hypertrophy. One of those is elevated levels of the protein Fibroblast Growth Factor 23 (FGF23), and these levels increase as kidney function deteriorates. However, FGF23 can be influenced by drugs in various ways. That is the finding of a recent study led by Katharina Dörr from the Division of Nephrology and Dialysis at MedUni Vienna's Department of Medicine III.

In a randomized controlled trial, 62 patients from two dialysis centers in Vienna (Vienna General Hospital, Vienna Dialysis Center) received either etelcalcetide (from the group of calcimimetics) or alfacalcidol (Vitamin D) over a period of one year. Both drugs are primarily used to treat a bone disease that commonly occurs in patients with kidney disease (secondary hyperparathyroidism). The treatment was administered to the patients intravenously after each dialysis session. The thickness of the heart muscle was measured by means of an MRI scan at the start of the trial and again at the end.

The result: "We were able to show that the FGF23 values had fallen significantly in the group being treated with etelcalcetide and the left ventricular mass was unchanged after one year, while there had been an increase in FGF23 levels in the alfacalcidol group and a further increase in cardiac hypertrophy," summarizes Katharina Dörr. "The reduction of FGF23 could slow the progression of pathological left ventricular hypertrophy by 6 to 8% within one year. An effective treatment for this disease could therefore reduce the risk of sudden cardiac death in this population, which already has a significantly elevated cardiovascular risk."

The trial was conducted at the Division of Nephrology and Dialysis of MedUni Vienna's Department of Medicine III between 2017 and 2019 by the working group led by Katharina Dörr and Divisional Head Rainer Oberbauer. Approximately 850 million people worldwide suffer from chronic kidney disease. In Western countries, around 10% of the adult population has chronic kidney damage, primarily caused by diabetes and hypertension. Globally, approximately 2.4 million people a year die from the sequelae of chronic kidney disease. Most causes of death are cardiological in nature.

More information: Katharina Dörr et al. Randomized Trial of Etelcalcetide for Cardiac Hypertrophy in Hemodialysis, *Circulation Research* (2021). DOI: 10.1161/CIRCRESAHA.120.318556

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