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Short Communication

Left Ventricular Hypertrophy in Hemodialysis Patients: Prevalence and Associated Risk Factors

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Abstract

For patients on chronic hemodialysis, cardiovascular problems are the primary cause of death and morbidity. The main cardiac abnormality is left ventricular hypertrophy (LVH). Our research's objectives are to evaluate the prevalence of LVH in our population and identify the risk factors linked to it.

Keywords: left ventricular hypertrophy; hemodialysis

Introduction and objectives:

For patients on chronic hemodialysis, cardiovascular problems are the primary cause of death and morbidity. The main cardiac abnormality is left ventricular hypertrophy (LVH). Our research's objectives are to evaluate the prevalence of LVH in our population and identify the risk factors linked to it.

Methodology:

This cross-sectional study, which was descriptive and analytical in nature, was conducted in the cardiology department of Ibn Rochd University Hospital from July 2022 to December 2023. 42 chronic hemodialysis patients were selected for our study from either ambulatory echocardiography consultation or cardiac hospitalization. Transthoracic echocardiography examinations was beneficial to the patients. In order to determine the factors that contribute to LVH, we analyzed the clinico-biological, echocardiographic, and demographic characteristics of patients with and without LVH. Software called SPSS 20 was used to do the statistical analysis. If $p < 0.05$, the result was significant.

Results:

The study included 42 patients, including 25 women (59.5%) and 17 men (40.5%). The average age was 45.34% +/- 13.4 years. The prevalence of LVH was 54.7% (23 patients). The statistical analysis of variance of the different anomalies showed that LVH was positively correlated with the duration of arterial hypertension but also with the blood pressure measurement: the mean systolic ($p = 0.007$) and diastolic ($p = 0.004$) arterial pressures were significantly higher in patients with LVH. LVH was also significantly higher depending on the duration of hemodialysis ($p=0.03$) and the severity of anemia ($p=0.046$).

Discussion:

The prevalence of left ventricular hypertrophy (LVH) in patients undergoing chronic hemodialysis in our study (54.7%) is consistent with findings from other studies, where LVH is reported as one of the most common cardiovascular complications in this population. The high prevalence of LVH can be attributed to the chronic pressure and volume overload that occurs in hemodialysis patients due to hypertension, anemia, and fluid retention.

Our findings demonstrated that the duration of arterial hypertension and elevated systolic and diastolic blood pressure were significantly associated with LVH, aligning with previous research that has established hypertension as a major risk factor for the development and progression of LVH. The longer the exposure to elevated blood pressure, the greater the likelihood of myocardial hypertrophy, especially in patients who may not achieve optimal blood pressure control during dialysis.

The relationship between anemia and LVH, which was also significant in our study ($p=0.046$), further supports the notion that chronic anemia contributes to compensatory cardiac hypertrophy. Anemia is common in patients with end-stage renal disease (ESRD), and it results in increased cardiac output to maintain adequate tissue oxygenation, leading to left ventricular remodeling over time. Management of anemia in hemodialysis patients, primarily through erythropoiesis-stimulating agents and iron supplementation, is crucial to mitigate the risk of developing LVH.

Additionally, the duration of hemodialysis was found to be significantly correlated with LVH in our population ($p=0.03$). Longer periods of hemodialysis have been associated with progressive structural changes in the myocardium, potentially due to the cumulative effects of uremic toxins, volume overload, and inflammatory processes. This highlights the importance of early detection and intervention in managing these risk factors to prevent further cardiovascular deterioration.

Conclusion

The high prevalence of LVH in chronic hemodialysis patients underscores the need for regular cardiovascular monitoring in this population. Early and aggressive management of hypertension, anemia, and other modifiable risk factors is essential to reduce the burden of cardiovascular morbidity and mortality in these patients. Close collaboration between nephrologists and cardiologists is pivotal to optimizing care and preventing complications associated with LVH.

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