Association between albuminuria and heart failure with preserved ejection fraction (HFpEF)

Thesis

Submitted in partial fulfillment of

Master Degree of Cardio

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Background: Heart failure with a preserved ejection fraction (HFpEF) causes 50% of heart failure hospitalizations worldwide. The diagnosis of HFpEF is still challenging. In this regard, simple modalities and diagnostic algorithms are becoming more important to aid the diagnosis. Albuminuria is a common finding in patient with heart failure with an established prognostic value and a potential diagnostic benefit.

Objectives: Our aim is to study the association between albuminuria (microalbuminuria and macroalbuminuria) and HFpEF probability in patients presented to Fayoum university hospital, and to correlate between albuminuria level and the HFpEF probability using H2FPEF score.

Patient and methods: A hospital-based cross-sectional study involved 200 Patients presenting with exertional dyspnea (NYHA II/III) and an ejection fraction of 50% or more. H2FPEF score was calculated for each patient Then patients were classified according to the score into: high probability group including a score of 6-9, intermediate probability group with a score of 2-6, and a low probability group with a score of 0-1. First morning mid-stream urine samples were collected and analysed for UACR. Micro-albuminuria was defined as an UACR of 30 mg/gCr, while macro-albuminuria is defined as an UACR of 300 mg/gCr or more.

Results: We found that albuminuria levels show a statistically significant positive correlation with the probability of HFpEF ($r = 0.42$ with a p-value of <0.001). The comparison of albuminuria levels at different levels of the H2FPEF score revealed a statistically significant higher level of Albuminuria (UACR) among cases with a high probability of HFpEF by the H2FPEF Score with p-value <0.001. There was a statistically significant increased mean urinary albumin creatinine ratio in low, intermediate, and high probability groups (32.5 ± 83.3 vs. 83.4 ± 108.5 vs. 183.5 ± 98.1, $p <0.001$) respectively. In a ROC analysis, the sensitivity for albuminuria in the diagnosis of intermediate and high probability levels was (70%, and 60.9%) and the specificity was of (51.4%, and 68.3%) at the cut off values (16.5, and 47.5) respectively.

Conclusion: There is an association between albuminuria and HFpEF probability. As a simple and cheap investigation, it has a potential to be used as a test in patients with exertional unexplained dyspnea. Second and more important is that albuminuria is a potential biomarker to be included in multivariable probability scores especially in the intermediate probability zones.