Cystatin C as a risk indicator for complications in patients with hypertension

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Dear Editor,

I have read with interest an article by I. Dunaieva titled "Cystatin C improves cardiovascular risk prediction in cardiometabolic patients in addition to estimated glomerular filtration rate" [1]. The author studied 111 patients diagnosed with arterial hypertension (AH) and various comorbidities, dividing them into four groups: 22 patients with only AH, 30 patients with AH combined with obesity, 31 patients with AH with type 2 diabetes mellitus (T2DM), and 28 patients with AH, T2DM, and obesity. The study concluded that cystatin C (Cys C) is associated with decreased GFR regardless of the presence of T2DM. An increase in Cys C level is a predictor of cardiovascular events in patients with comorbidities. Furthermore, Cys C is a significant marker for predicting cardiovascular risk in patients with hypertension. Inspired by this work, we aim to explore additional applications of Cys C levels as a predictor among individuals with hypertension.

Cys C can be used as an alternative to the estimated glomerular filtration rate (eGFR) [2]. Increased serum levels of CysC are a sensitive biomarker for glomerular renal function and can serve as an early detector of kidney damage. Cys C is also widely used for cardiovascular risk prediction, renal function assessment, and stratifying patient risk. All these applications can also be utilized in patients with arterial hypertension (AH). Additionally, Cys C levels may be used to predict complications specific to this condition.

It has been found that Cys C levels are elevated in individuals with uncontrolled hypertension compared to those with controlled hypertension. In the research conducted by M. Omaygenç et al., 1037 patients were screened and grouped based on their diagnosis and control of hypertension into patients with uncontrolled hypertension and patients with controlled hypertension [3]. While serum creatinine levels remained similar in both groups, serum cystatin C levels in patients with uncontrolled hypertension were higher than those in patients with controlled hypertension. This finding allows for the earlier identification of patients with subtle kidney dysfunction before a decline in eGFR occurs.

Cys C can be used to predict complications of arterial hypertension in affected individuals, one of which is hypertensive retinopathy, characterized by damage to the retinal vessels and the retina itself. Recent data shows that Cys C is correlated with the blood flow in the optic disc and macula in patients with hypertension [4]. In research conducted by Huang et al., 100 patients with primary hypertension were selected: 50 with elevated cystatin C and 50 with normal cystatin C, and tested with optical coherence tomography angiography. The re-

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sults confirmed that Cys C is negatively associated with macular vessel density and vascular perfusion density and could be used as a predictor of these conditions in hypertensive individuals.

Another complication of hypertension is cardiac hypertrophy. In a study conducted by Prats M. et al. involving 49 non-diabetic patients with primary hypertension and normal serum creatinine, it was found that cystatin C levels are independently related to the left ventricular mass index, while serum creatinine and estimated glomerular filtration rate did not show such a relationship [5]. This suggests that Cys C levels could be a marker of cardiac hypertrophy in this patient group.

All these findings confirm the wide range of applications for measuring Cys C levels and its role in predicting cardiovascular diseases and in patients diagnosed with AH.

References

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