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The difference in the serial change of indoxyl sulfate after catheter ablation among atrial fibrillation patients with or without chronic kidney disease

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Introduction: It is well known that catheter ablation (CA) for patients with atrial fibrillation (AF) improves their renal function. However, the precise mechanism of improving a renal function, such as a transition of the uremic toxin is unclear.

Purpose: Indoxyl sulfate (IS), a protein-bound uremic toxin, induces chronic kidney disease (CKD) and AF. This study aimed to investigate the transition of serum IS level in the AF patients with and without CKD after CA.

Methods: A total of 138 consecutive AF patients who underwent CA and maintained sinus rhythm were prospectively enrolled (age 65.5±10.7 years, paroxysmal AF 67.4%). Patients were divided into 4 groups (non-CKD/low-IS:68, non-CKD/high-IS:28, CKD/low-IS:13, CKD/high-IS:29). CKD was defined as CKD stage III (estimated glomerular filtration rate (eGFR) 30-60 ml/min/1.73m2), and high-IS was defined according to the mean of IS (IS=1.1 µg/ml) before CA. Plasma IS levels and eGFR were determined before and at 1 year after CA. We evaluated the relationship between the IS and eGFR after CA among the 4 groups.

Results: CA significantly improved the eGFR in patients with CKD (from 50.2±5.7 to 55.4±10.8 ml/min/1.73m2, p<0.001). The serum IS level in the patients with non-CKD/high-IS was significantly decreased (from 1.7±0.7 to 1.1±0.6 µg/ml, p<0.001). However, the serum IS level in the patients with CKD/high-IS was not improved (from 1.9±0.9 to 1.7±0.7 µg/ml, p=0.22) and significantly higher than that in the others (p<0.001), regardless of improving their eGFR (Figure). Furthermore, the multiple regression analysis revealed that the ?IS, between before and after CA, was independent of eGFR.

Conclusion: The change of IS in the patients with CKD was significantly different from that in those without CKD. In the patients with CKD, CA improved their eGFR, however, the serum level of IS, a protein-bound uremic toxin, was not improved after CA.
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