

## ACE inhibition in nutcracker syndrome with orthostatic proteinuria: how about a hemodynamic effect?

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Sirs,

We read with great interest the recent contribution by Ha et al. in *Pediatric Nephrology* [1]. They reported on a 14-year-old girl with orthostatic proteinuria associated with nutcracker syndrome, which disappeared after angiotensin-converting enzyme (ACE) inhibition, although no treatment has been recommended in orthostatic proteinuria due to its benign condition. They used ACE inhibitor because moderate mesangial hypercellularity in a renal biopsy of this patient might be related to nutcracker syndrome.

ACE inhibitor can reduce proteinuria by decreasing renal vascular resistance, intraglomerular capillary pressure and filtration fraction, which might be related to efferent vasodilation [2]. However, we should also consider the changes in renal hemodynamics after ACE inhibition in children with nutcracker syndrome. Although not studied in nutcracker syndrome, left renal venous blood flow was reported by Le Jemtel et al. to have increased following ACE inhibition in patients with stable congestive heart failure when the continuous thermodilution technique was used [3]. In healthy children without nutcracker syndrome, increased left renal venous blood flow will normally drain

to the inferior vena cava without an increase in pressure. However, if the left renal venous blood flow increases in children with nutcracker syndrome, the left renal venous pressure will also increase, owing to stenosis of the left renal vein between the aorta and the superior mesenteric artery. In this situation there is a possibility that collateral blood flow and pressure may be increased by dispersion of the left renal venous pressure.

We speculate that the improvement of nutcracker syndrome due to physical development [4] of this patient during ACE inhibitor therapy might somewhat offset an increase of the left renal venous or collateral pressure and reduce the degree of proteinuria. However, acute or chronic effects of ACE inhibition on the renal hemodynamics, dose-related response, pressure-related changes should be further elucidated in children with nutcracker syndrome before the use of ACE inhibitor is accepted in orthostatic proteinuria associated with nutcracker syndrome.

### References

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