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Sexual dimorphism of natriuresis and diuresis in patients with non-diabetic chronic kidney disease

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Objectives: A recent study demonstrated female rats more rapidly excreted urine sodium and water under saline bolus infusion than male rats. However, the sexual differences in renal salt and water excretion was not yet investigated with human data. We purposed to clarify whether the sexual difference of natriuretic and diuretic ability exists, and it associates blood pressure(BP) in nondiabetic chronic kidney disease(CKD) patients.

Methods: This is a secondary analysis of E-SPECIAL study. A total of 235 patients had stopped all renin-angiotensin blocking agents or diuretics during a run-in period for eight weeks(0w). After the run-in period, they received olmesartan(40mg daily) for eight weeks(8w), and then maintained the same medicine with low-salt diet education for an additional eight weeks(16w).

Results: Mean age of premenopausal women(n=50), young men(n=76), postmenopausal women(n=68), and older men(n=41) was 40.7, 40.2, 59.0, and 69.9 years old, respectively. Their MDRD eGFR was 76.2, 71.6, 59.8, and 58.8 mL/min/1.73m^2. BP was lower in premenopausal women than in young men. Daily salt intake decreased in 16w in premenopausal women and young men, while there was no significant change in postmenopausal women and older men. Except for the premenopausal women, 24 hours urine sodium excretion significantly decreased in 16w compared with that in 0w or 8w. Urine volume was significantly larger in the premenopausal women than in young men in 8w and 16w, while it was not different between postmenopausal women and older men. Pressure-natriuresis was conserved in premenopausal women and young men, while pressure-diuresis was only operated in premenopausal women.

Conclusions: Pressure-natriuresis and pressure-diuresis was well conserved in premenopausal women compared with young men, and it disappeared in postmenopausal women. Augmented natriuretic and diuretic potency might contribute to lower BP in premenopausal women with nondiabetic CKD.