

Abstract Type : Poster

Abstract Submission No. : 1100

Effects of renin-angiotensin system blockers on renal adaptation following unilateral nephrectomy in patients with hypertension

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Objectives: After nephrectomy, the remaining kidney responds with renal adaptation by increased filtration to compensate for decreased functional renal mass. Despite many potential benefits of renin-angiotensin-system (RAS) blockers, the use of RAS blockers immediately following nephrectomy has been hesitant due to concerns regarding impaired renal adaptation. We aimed to evaluate the effect of use of RAS blockers immediately following unilateral nephrectomy on renal adaptation.

Methods: This single-center, retrospective cohort study included a total of 580 patients who underwent elective unilateral nephrectomy from 2010 to 2020 and have pre-existing hypertension with anti-hypertensive medications. Patients were classified according to use of RAS blockers within 1 week after nephrectomy. Primary outcome was renal adaptation defined as post-nephrectomy eGFR/pre-nephrectomy eGFR at 1 month after surgery.

Results: Among 580 patients, 308 (53.1%) patients began RAS blockers within 1 week after nephrectomy and 406 ([JJ1] [LS2] 70%) patients were male. Patients with RAS blockers were younger (63.8 ± 10.4 vs 66.8 ± 10.3) and had slightly higher GFR (79.4 ± 17.1 vs 75.5 ± 19.6) than those without RAS blockers. The use of RAS blockers did not show any difference in renal adaptation at 1 month (with RAS blockers 67.1 ± 10.7 vs without RAS blockers 66.8 ± 11.6 , $p = 0.711$). There was also no difference in the incidence of hyperkalemia (serum potassium > 5.5 mmol/L) between the two groups until a year postoperatively. RAS blockers were associated with a lower risk of a composite outcome of mortality or end-stage kidney disease than the control group [adjusted hazard ratio 0.502, 95% confidence interval 0.315–0.801, $p = 0.004$].

Conclusions: The use of RAS blockers immediately following unilateral nephrectomy did not cause deterioration of renal adaptation or increase hyperkalemia in patients with hypertension. Furthermore, the use of RAS blockers was associated with a better prognosis.