LOW-DOSE TOLVAPTAN AS FUROSEMIDE ALTERNATIVE PRESERVES RENAL FUNCTION AND RENIN-ANGIOTENSIN SYSTEM DURING INTENSIVE TREATMENT IN PATIENTS WITH CONGESTIVE HEART FAILURE

Poster Contributions
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Background: Although loop diuretics are broadly used for congestive heart failure (HF), there frequently appear serious adverse effects such as worsening of renal function and activations of the sympathetic and renin-angiotensin system via arterial underfilling. On the other hand, the effects of sodium channel independent diuretic Tolvaptan on those complications in acute phase of HF patients are still unclear.

Methods and Results: Forty consecutive patients hospitalized due to worsening of congestive HF were randomly assigned to receive either daily 40 mg of intravenous furosemide or 7.5 mg of oral Tolvaptan, in addition to intravenous 0.025γ of carperitide and 200 mg of canrenoate potassium. Renal functions and neurohumoral factors were evaluated for 5 days after the admission. As results, patient characteristics were similar between Furosemide (n=21) and Tolvaptan group (n=19). Total of 5-day urine volume or fluid balance was not significantly different (10169 vs. 9807 mL, -4627 vs. -3549 mL, respectively), and similar degrees of improvement in BNP were achieved in both groups (-155±485 vs. -284±535 pg/mL). However, the value of serum creatinine (Cr) significantly deteriorated in Furosemide group (25±58 vs. -5.4±16%, p=0.033), and preservation of renal function occurred more frequently in Tolvaptan group (9.5 vs. 44%, p=0.018). Consequently, increase of Cr to earn 1000 mL of urine was 3-fold higher in Furosemide group (0.046±0.070 vs. 0.016±0.030 mg/dL/1000mL, p=0.086). On the contrary, increase in the ratio of BUN/Cr was significantly higher in Furosemide group (2.7±8.1 vs. -5.7±14, p=0.023), suggesting arterial underfilling via forced dehydration. In terms of neurohumoral factors, although decreases of catecholamines were not significantly different (adrenaline: 49±95 vs. 55±82, noradrenaline: 41±60 vs. 74±19, dopamine: 3.6±257 vs. 55±71%), the value of plasma renin activity was enhanced only in Furosemide group (200±365 vs. 16±92%, p=0.040).

Conclusion: Low-dose Tolvaptan preserved renal function and renin-angiotensin system during intensive treatment in patients with congestive HF. This novel therapy may release HF patients from adverse effects with furosemide.