The efficacy of tolvaptan in acute heart failure - an updated meta-analysis

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Background

Effective decongestion is important in the management of acute decompensated heart failure. Currently, guidelines recommend the use of loop diuretics. However, there are many challenges associated with it. One of them is diuretic resistance. Another is acute renal injury. At present, there are no evidenced based recommendations that target the preservation and/or restoration of renal function in the treatment of heart failure. Tolvaptan can be a promising treatment in the management of heart failure by acting on a unique segment of the renal tubule.

Objective

This paper aimed to establish the efficacy of Tolvaptan in the treatment for acute heart failure.

Methods

We searched the available literature from the databases of MEDLINE, Cochrane CENTRAL and ClinicalTrials.gov for studies investigating the effects of Tolvaptan on acute heart failure published until October 30, 2018. Two reviewers independently screened studies then extracted relevant data against the pre-specified eligibility criteria. We assessed for risk for bias in the individual studies using the Cochrane Risk of Bias Tool Approach. Outcomes assessed included effects on mortality, length of hospitalization, incidence of worsening renal function (WRF), change in body weight, change in urine output and hypernatremia. We pooled data using a random effects model with Revman 5.3.

Results

Eight studies with 5169 patients were included. Tolvaptan resulted to significantly decreased incidence of worsening renal function (risk ratio 0.51 (CI: 0.27, 0.96)). On subgroup analysis, relative risk of worsening renal function was 0.40 (CI: 0.21, 0.76) for studies with patients with higher mean Ejection fraction (>40). Tolvaptan could result to a small increase in creatinine in patients with reduced Ejection Fraction (Mean difference 0.05 (CI: 0.03, 0.07). Tolvaptan had significantly better effect on decreasing body weight (mean difference -0.79 (CI: -0.91, -0.68)) and increasing urine output (Mean difference 1.61 (CI 1.08, 2.13)). There was a significant increase in the incidence of hypernatremia with the use of Tolvaptan (risk ratio 3.29 (CI: 1.77, 6.12)). Assessment of other outcomes showed no significant effects when it came to long term (risk ratio 0.98 (CI: 0.88, 1.08)) and short term (risk ratio 0.69 (CI: 0.33, 1.45)) mortality and length of hospital stay (mean difference -0.22 days (CI -9.71, 9.28)).

Conclusion

Tolvaptan is effective in the promotion of fluid loss. It may also be beneficial in decreasing the incidence of worsening renal function and may be an alternative option to loop diuretics in decongesting patients in acute heart failure patients with preserved ejection fraction.

Further studies need to be done to investigate this relationship.
heart failure. However, it may have more benefit for heart failure patients with preserved ejection fraction. Further studies need to be done to investigate this relationship.