Comparing the Re-Hospitalization Rates and Cardiac Mortality in CHF Patients Taking Torsemide versus Furosemide

Jeanette Brendle MD[1,2], Shivanie Ramdin DO[1,2], Kaviya Sathyakumar MD[1,2], Michael Usberghi DO[2], Nicholas Dorsey, MD[1,2,4], Hayden Dansbury[3],

[1]University of Central Florida College of Medicine, Graduate Medical Education, Orlando FL
[2]HCA Florida Ocala Hospital, Family Medicine Residency Program, Ocala FL
[3]HCA Healthcare Graduate Medical Education, Brentwood, TN
[4]Heart of Florida Health Center, Ocala, FL

Background

Exacerbation of congestive heart failure (CHF) is one of the most common causes of hospitalization in the US for people over age 65. Among the several diuretics available for treatment of CHF, Furosemide is most widely used. Pharmacokinetic studies of these diuretics illustrate that Torsemide has better oral bioavailability, making it more effective than Furosemide. According to a meta-analysis study published in 2020, Torsemide use in CHF patients, compared to Furosemide, resulted in lower risk of hospitalization, improved NYHA class III/IV functional status, and lower risk of cardiac mortality.

Objective

The purpose of our study was to compare the re-admission rates and cardiac mortality of patients with CHF who were taking Torsemide versus Furosemide prior to hospitalization.

Methods

We performed a retrospective study, identifying patients hospitalized in Florida with a CHF exacerbation between 2018 and 2021. Originally, 70,001 patients were identified. Patients were excluded if they were under the age of 65, not taking furosemide or torsemide, having a diagnosis of medication noncompliance, and missing demographic information. After exclusion criteria were evaluated, 47,524 patients met criteria for the study. They were stratified into two groups according to their diuretic use (Torsemide vs. Furosemide). The rates of re-hospitalization with CHF exacerbation within 30 days, 90 days, and 1 year of discharge from hospital were measured. Similar method was used to measure cardiac mortality among these patients within 30 days, 90 days, and 1 year of discharge from initial hospitalization.

Results

Total of 47,524 patients were identified to be hospitalized with CHF exacerbation, amongst whom 45,852 (96.5%) were taking Furosemide and 1,672 (3.5%) were taking Torsemide. In patients who were taking Furosemide, the odds of re-hospitalization within 30 days, 90 days, and 1 year were 0.874 (p-value = 0.0105, 95% CI: [0.788-0.969]), 0.932 (p-value = 0.1667, 95% CI: [0.843-1.030]), and 0.962 (p-value = 0.4742, 95% CI: [0.864-1.071]), respectively.

This research was supported (in whole or in part) by HCA Healthcare and/or an HCA Healthcare affiliated entity. The views expressed in this publication represent those of the author(s) and do not necessarily represent the official views of HCA Healthcare or any of its affiliated entities.

In those that were taking Furosemide, the odds of cardiac mortality within 30 days, 90 days, and 1 year of hospital discharge were 0.998 (p-value = 0.9855, 95% CI: [0.839-1.189]), 1.031 (p-value = 0.6986, 95% CI: [0.883-1.205]), and 0.987 (p-value = 0.8548, 95% CI: [0.0855-1.139]), respectively.

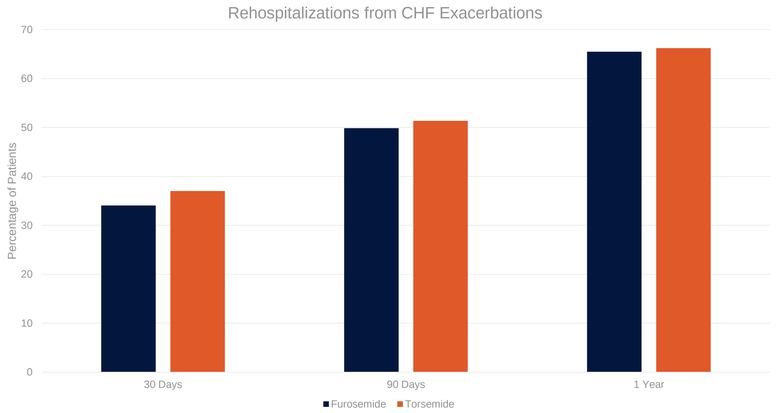

Figure 1: Percentage of Patients with CHF taking Furosemide vs. Torsemide who underwent Rehospitalization

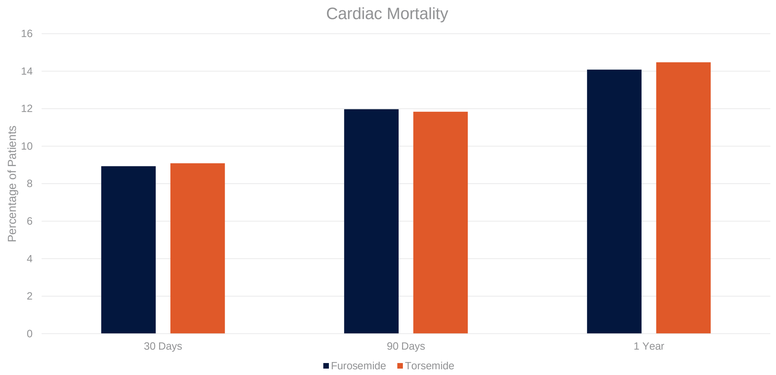

Figure 2: Percentage of Patients with CHF taking Furosemide vs. Torsemide who experienced Cardiac Mortality

Discussion

Overall, Furosemide use had lower risk of readmission rates within 30 days, 90 days, and 1 year of initial admission for CHF exacerbation. Furosemide use also had lower risk of cardiac mortality within 30 days and 1 year of initial admission for CHF exacerbation. Torsemide was only shown to lower cardiac mortality within 90 days of initial admission for CHF exacerbation. Of these results, Furosemide was only statistically significant at lowering the risk of readmission within 30 days of initial hospital admission.

While previous studies reported that Torsemide use in CHF patients resulted in lower risk of hospitalization and lower risk of cardiac mortality, our data suggests that Furosemide is the optimal choice of diuretic.

While these results did show that the optimal diuretic choice for patients with CHF is Furosemide, there are still some limitations to the study. The amount of patients taking Furosemide vs. Torsemide were not equal at a 1:1 ratio. Also when gathering data, we were unable to differentiate between patients with heart failure with a reduced ejection fraction and a preserved ejection fraction because the ICD-10 code for the type of heart failure was not included in most of the patient's diagnosis list. Further studies are needed in order to try to gather data where patients type of heart failure is identified and the ratio of patients taking Furosemide vs. Torsemide is more equal. Further analysis of the data is needed to account for possible confounding factors due to heart failure medication optimization prior to admission and severity of illness.

Conclusions

Overall, Furosemide use had lower risk of re-admission rates within 30 days, 90 days, and 1 year, and lower risk of cardiac mortality within 30 days and 1 year of initial hospital admission. In addition, Furosemide use had statistically significant lower risk of re-admission within 30 days of initial hospital admission.

References

1. Abraham, B., Megaly, M., Sous, M., Azzo, Z., Mesiha, N., & Sharma, R. (2020). Meta-Analysis Comparing Torsemide Versus Furosemide in Patients With Heart Failure. The American Journal of Cardiology, 92-99.
2. Nair, R., Lak, H., Hasan, S., Gunasekaran, D., Babar, A., & Gopalakrishna, K. V. (2020). Reducing All-cause 30-day Hospital Readmissions for Patients Presenting with Acute Heart Failure Exacerbations: A Quality Improvement Initiative. *Cureus.*
3. Tsuyuki, R. T., McKelvie, R. S., & Arnold, M. O. (2001). Acute Precipitants of Congestive Heart Failure Exacerbations. JAMA Internal Medicine, 2337-2342.