**Facility-level initiation of empagliflozin during hospitalization and at discharge for eligible patients admitted for acute decompensated heart failure**

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Abstract:

**Background**

The 2022 AHA/ACC/HFSA guidelines for acute decompensated heart failure (ADHF) recommend sodium glucose transporter 2 inhibitors (SGLT2i) as part of the guideline-directed medical therapy (GDMT) to improve outcomes and reduce hospitalizations. The VA Southern Nevada Healthcare System (VASNHS) has empagliflozin as its formulary SGLT2i. Limited data is available on the utilization of empagliflozin in our facility. The primary outcome is the initiation of empagliflozin for patients admitted with ADHF during hospitalization and at discharge. The secondary outcome is the rate of clinical pharmacist practitioner (CPP) interventions resulting in the initiation of empagliflozin for patients admitted with ADHF.

**Methods**

Single centered retrospective chart review from Sept 2023 to Sept 2024 using the VA’s computerized electronic record systems (CPRS). Inclusion criteria were patients who had a primary diagnosis of ADHF. Patients were excluded if they had a history of genitourinary infections, history of ketoacidosis, acute kidney injury (AKI) at any point during admission, estimated glomerular filtration rate (eGFR) < 20 mL/min/1.73m2, systolic blood pressure (SBP) <100 mmHg, or history of hypersensitivity to any SGLT2i.

**Results**

From the 70 patients that were randomized, results shows that 56 (80%) patients were appropriately initiated with empagliflozin during hospitalization and at discharge. 14 out the 56 (25%) patients were initiated by CPPs in our facility.

**Conclusion**

The quality improvement project has shown that VASNHS is meeting heart failure guideline recommendations with respect to SGLT2i utilization. However, with the limitations, continuation of this quality improvement project assessing other medications from the GDMT therapy, and a larger sample size can provide a more in-depth analysis of guideline compliant of our facility for patients with ADHF.

Keywords: Acute decompensated heart failure, Guideline Directed Medical Therapy, Clinical Pharmacist Practitioner

1. Background

Heart failure is a clinical syndrome with signs and symptoms from a structural or functional impairment of ventricular filling or ejection of the blood.Clinical presentations of heart failure include the presence of jugular venous distention, orthopnea, bendopnea and leg edema. Acute decompensated heart failure (ADHF) is an event that signals worsening signs and symptoms of heart failure which calls for the need to restore hemodynamic compensation and optimization of medication therapy. The 2022 AHA/ACC/HFSA guidelines for ADHF recommend sodium glucose transporter 2 inhibitors (SGLT2i) as part of guideline-directed medical therapy (GDMT). The VA Southern Nevada Healthcare System (VASNHS) has empagliflozin as its formulary SGLT2i. Limited data is available on the utilization of empagliflozin in our facility. The goal of this medication use evaluation (MUE) project is to assess our facility’s level of empagliflozin initiation, and the impact of pharmacist interventions in the management of ADHF. We have clinical pharmacist practitioners (CPPs) who review hospital patients alongside our physicians/nurse practitioners and can independently prescribe using a scope of practice. The primary outcome is the initiation of empagliflozin for patients admitted with ADHF during hospitalization and at discharge. The secondary outcome is the rate of CPP interventions resulting in the initiation of empagliflozin for patients admitted with ADHF.

**2. Methods**

This MUE is a single centred retrospective chart review from Sept 2023 to Sept 2024 using the VA’s computerized electronic record system (CPRS).

***2.1 Data Collection***

Inclusion criteria were patients who had a primary diagnosis of ADHF. Patients were excluded if they had a history of genitourinary infections, history of ketoacidosis, acute kidney injury (AKI) at any point during admission, estimated glomerular filtration rate (eGFR) less than 20 mL/min/1.73m2, systolic blood pressure (SBP) less than 100 mmHg, or history of hypersensitivity to any SGLT2i.

***2.2 Data Analysis***

Data analysis was conducted utilizing VA medication evaluation toolkit which utilizes resources based from the Joint Commission on the Accreditation of Healthcare Organizations and the American Society of Health-System Pharmacists (ASHP). Joint Commission suggest a population size greater than 500 cases, sample 70 random cases. This rationale was established for statistical significance, relative simplicity, and sensitivity to an organization’s population size. Since the population size for data was originally 495 patients, 70 patients were randomized for this MUE. Lastly, a patient random number generator was used for randomization.

**3. Results**

A total of 160 patients were reviewed. 90 patients were excluded. 13 patients had no ADHF despite the documented diagnosis of ADHF upon chart review, 57 patients had already initiated empagliflozin outpatient for diabetes, 10 patients had a SBP of less than 100 mmHg, 7 patients had eGFR less than 20, and 3 patients had recurrent UTIs. A total of 70 patients were included. The primary outcome result were 56 (80%) patients were initiated empagliflozin on admission and/or at discharge and 14 (20%) patients were not initiated empagliflozin despite meeting criteria. From the 56 patients, 40 patients were initiated empagliflozin from providers and nurse practitioners while 16 patients were initiated by clinical pharmacist practitioners. Baseline characteristics were similar among patients. The average age was 73.1 years old with a range of (49-94), SBP average of 126.5 mmHg (101-202), eGFR 59.5 mL/min/1.73m2 (21-90) and 100% of the patients were initiated with empagliflozin dose of 12.5mg.

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| Baseline characteristics | Included patients (n=70) |
| Age – years (range) | 73.1 (49-94) |
| Systolic Blood Pressure – mmHg(range) | 126.5 (101-202) |
| eGFR – mL/min/1.73 m2 (range) | 59.5 (21-90) |
| Initiating Dose – mg (%) | 12.5 (100) |

**Primary Outcome Results**

**Secondary Outcome Results**



**4. Discussion**

Based on the results, this MUE project has indicated that our practitioners are compliant with the utilization of empagliflozin in patients admitted with ADHF. Data also shows that CPPs have made impacts in assisting providers in the initiation of empagliflozin. These findings will be disseminated to our facility for assurance to our healthcare providers. The aim is to assure providers that the current practices are in line with the guidelines and to reinforce the importance of continuing to initiate empagliflozin during hospital admission and/or discharge.

***4.1 Limitations***

While this MUE has shown promising results, there are limitations that this project presents. These limitations include the small sample size and the fact that empagliflozin was the sole medication evaluated from the GDMT therapy. Furthermore, there were inaccuracies in the data extraction process for patients admitted with ADHF using ICD-10 codes from the pharmacy informatics. Some patients were incorrectly recorded under the ICD-10 code for ADHF, while their actual diagnosis, as indicated in the providers' intervention notes, was different.

**5. Conclusion**

With the recent update of the HF guidelines and the limited data on empagliflozin initiation in our facility for ADHF, questions have arisen whether our facility is currently adhering to the guidelines by initiating empagliflozin as part of GDMT during admission and/or discharge. This MUE project findings has shown that our facility is meeting heart failure guideline recommendations with respect to SGLT2i utilization. However, further improvements in the methods and continued expansion of this project would provide more robust evidence. By assessing other GDMT medications with a larger sample size and working with informatics to extract more accurate data, this would provide a more in-depth analysis of guideline compliance at the VASNHS facility with ADHF.

Conflicts of Interest

No conflict of interest are subjected for this project.

Acknowledgements

I want to thank Dr. Ted Turner, PharmD, BCPP, and Mr. Sean Jones for participating for the approval of this quality improvement project. I also would like to thank Dr. Kevin Wegener, PharmD and Dr. Allen Cuenco, PharmD for the assistance of the data extraction and data analysis.

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