Incidence of hypoglycemia in non- diabetic Heart failure with reduced Ejection Fraction (HF_rEF-<40%) Patients on Sodium/glucose cotransporter-2 (SGLT-2) inhibitors

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***Abstract*-** In addition, recent results from the EMPEROR Reduced study of empagliflozin bode well that there will finally be an effective treatment for heart failure patients with preserved left ventricular ejection fraction. **Aim of the study is to** identify the incidence of Hypoglycemia in Non- diabetic Heart failure patients with reduced Ejection Fraction (<40%) for patients on SGLT2 Inhibitors. Methodology-Cross sectional study. **Result and conclusion**: Incidence of Hypoglycemia in Non- diabetic patient with Heart failure on SGLT-2 Inhibitors was 36%.

***Index Terms*- Sodium-glucose co-transporter 2 inhibitors, Heart failure, reduced ejection fraction, Hypoglycemia, Type 2 Diabetes.**

INTRODUCTION

Cardiovascular disease, especially heart failure, is the greatest public health burden and has the greatest impact on mortality in people with diabetes. In the Candesartan in Heart Failure - Mortality and Morbidity Assessment (CHARM) study, a 1% increase in glycated hemoglobin A1c (HbA1c) was associated with a 25% increase in the risk of cardiovascular events or death in up to 264 million people with diabetes was involved. Glucagon-like peptide-1 (GLP-1) receptor agonists reduce the risk of myocardial infarction (MI), stroke, and cardiovascular death in patients with type 2 diabetes, but their use to prevent heart failure is limited. Recommended. it is not. Sodium glucose cotransporter 2 inhibitors (SGLT2i) are a new class of antidiabetic agents that mediate epithelial glucose transport to the proximal renal tubules, inhibit glucose absorption, and improve glycemic control. SGLT2i also has cardiovascular benefits, especially in the treatment of heart failure. Canagliflozin (CANA) has demonstrated effective glycemic control by lowering HbA1c and was the first his SGLT2i approved by the Food and Drug Administration (FDA) in 2013. Complications in people with type 2 diabetes, such as stroke, heart attack, and heart failure. Cardioprotective properties of SGLT2i and its role in the management of his type 2 diabetes in combination with metformin. The FDA and European Medicines Agency (EMA) have approved his four oral SGLT2 inhibitors for the treatment of type 2 diabetes.

AIM OF THE STUDY

To identify the incidence of Hypoglycemia in Non- diabetic Heart failure patients with reduced Ejection Fraction (<40%) for patients on SGLT2 Inhibitors.

MATERIALS AND METHOD

PATIENT SELECTION

All patients in Medicine OPD Detailed medical histories and laboratory findings were taken up for the study. A total of 50 patients based on the clinical criteria of Ejection fraction < 40% with heart failure on SGLT-2 inhibitor as a supportive treatment was taken up for the study. The normoglycemic levels were noted for the patients on their previous visits and hence the history of Diabetes is ruled out. At the time of admission with Heart failure patients on SGLT2 inhibitor were taken up for the study. And the incidence of hypoglycemia was noted.

SAMPLING TECHNIQUE

Consecutive sampling

STUDY DESIGN

Cross sectional study

STUDY SETTING

Sri Lakshmi Narayana Institute of Medical Sciences

STUDY PERIOD

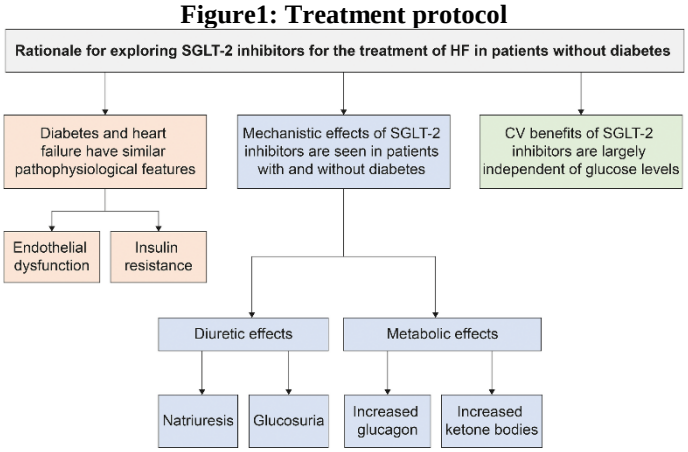
November 2021- October 2022

PROTOCOL FOR THE TREATMENT

Even without overt diabetes mellitus, patients with heart failure have sodium and fluid retention, coronary, myocardial, and systemic endothelial dysfunction independent of EF. In preclinical models of heart failure, treatment with empagliflozin (or gene knockout to simulate SGLT-2 inhibition) improved cardiac function.

In other experimental models of heart failure without diabetes mellitus, empagliflozin prevented deterioration of cardiac function.

Figure1: Treatment protocol



RESULTS

A clinical study on Hypoglycemia in heart failure, Non- diabetic patients on SGLT 2 Inhibitor was studied. Fifty cases were studied over 11 months. Among the study participants, 68% were males and 32 % were females.

Gender of study participants:

Figure 2: Gender of study participants

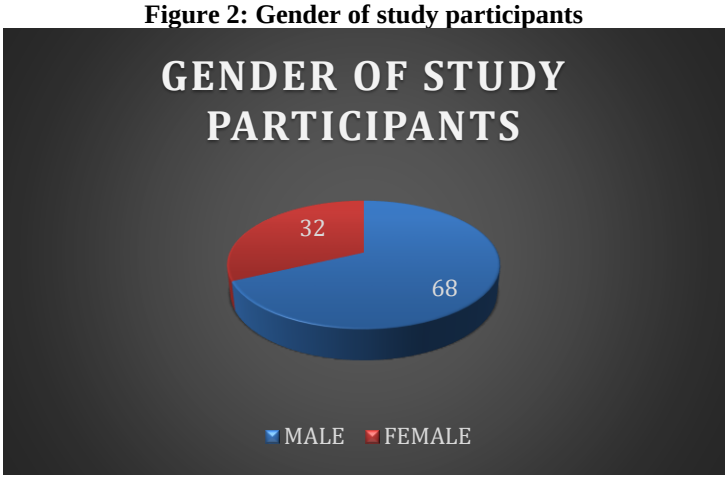
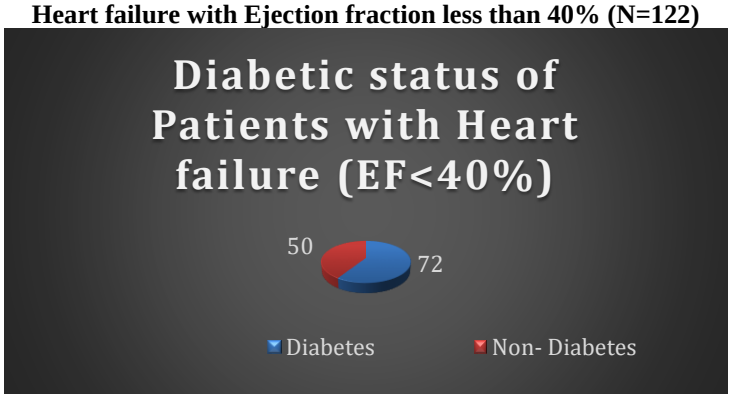
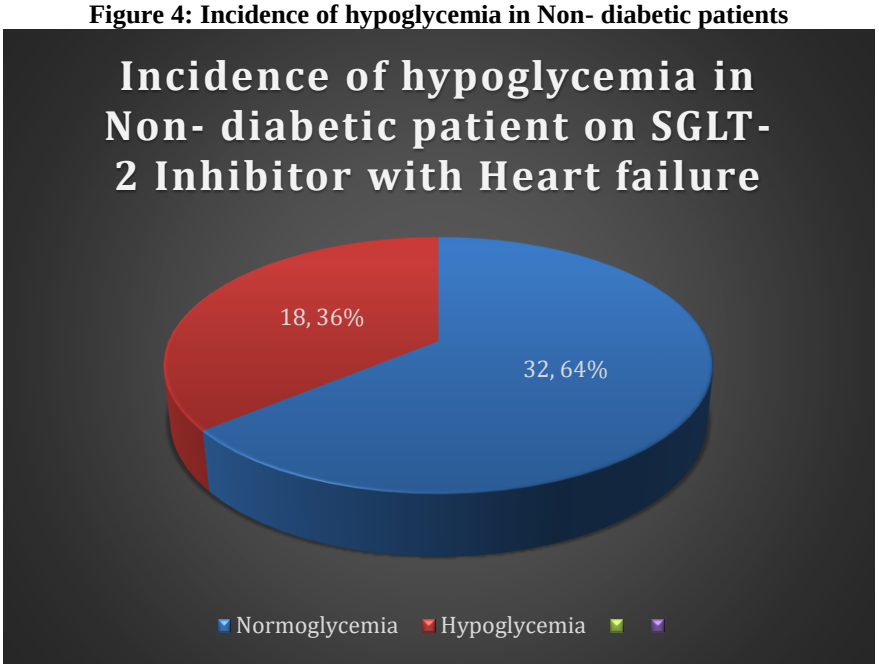


Figure 3: Diabetic status of patients on SGLT-2 inhibitor for Heart failure with Ejection fraction less than 40% (N=122)



Out of 122 patients who were on treatment with SGLT-2 Inhibitor for Heart failure with EF <40%, Using consecutive sampling technique, 50 participants with non- diabetes status were taken up for the study.

Figure 4: Incidence of hypoglycemia in Non- diabetic patients



It was noticed from this study that 36% of the study participants had hypoglycemic episode during the treatment with SGLT-2 inhibitor for non- diabetic patients with Heart failure with Ejection fraction <40%.

DISCUSSION

The cost of heart failure was estimated at $31 billion in 2012 and is expected to increase by 127% by 2030. Recent trends indicate a higher prevalence of his HFpEF than HFrEF, and it is estimated that by 2020, 65% of heart failure patients will have his EF >40%. Here, we identify a currently unmet need in the treatment of heart failure and highlight the potential role of sodium glucose cotransporter 2 (SGLT-2) inhibitors in addressing this need. In patients with heart failure, health-related quality of life (HRQoL) and risk of adverse clinical events change over the course of disease. Acute heart failure (AHF) episodes carry a high risk of poor clinical outcome, including worsening symptoms, worsening HRQoL, and an annual mortality rate of approximately 15-20%. However, cardiovascular studies in patients with type 2 diabetes have shown that these agents unexpectedly significantly reduce hospitalizations for heart failure. This has led to interest in his class of his SGLT2 inhibitors as potential treatments for heart failure. Several placebo-controlled clinical trials have been conducted to evaluate the effects of SGLT2 inhibitors in chronic heart failure patients with and without type 2 diabetes.

DAPA-HF (Dapagliflozin and Prevention of Adverse Outcomes in Heart Failure) and EMPEROR-Reduced are chronic heart failure with reduced ejection fraction (HFrEF), EMPEROR-Reduced, are currently queued. (The Empagliflozin Outcomes in Chronic Heart Failure with Preserved Ejection Fraction study evaluated hospitalization for heart failure or cardiovascular death in patients with preserved left ventricular ejection fraction (HFpEF) compared with placebo. In addition, the SOLOIST study investigated the efficacy of sotagliflozin (SGLT2 inhibitor and combination) were compared. Response to loop diuretics can be unpredictable, and many patients are treated for constipation after treatment.

The rationale for evaluating SGLT2 inhibitors in ischemic heart disease is that they are loop diuretics. It is to induce diuresis through different mechanisms, thereby enhancing potential additive or synergistic effects. The EMPULSE project involved his 530 cardiac patients from recruits of the His type, who were randomized to study the effects of empagliflozin on hospitalized patients with acute myocardial failure. The ratio to empagliflozin or placebo at first admission (24 hours to 5 days) is 1.

Patients with de novo coronary artery disease and congestive heart failure were eligible. This included patients with coronary artery disease suspected of de novo heart failure and patients with congestive heart failure. Volume reduction occurred more frequently in the empagliflozin group (1%) and did not differ between groups. % received a single dose and 50 non-diabetic patients were recruited. The study found that 36% of his study participants were non-diabetic, had an ejection fraction less than half, and were treated with an SGLT-2 inhibitor.

CONCLUSION

Thus SGLT2 which is recommended drug used in Heart failure can cause hypoglycemia in normoglycemic patients.

RECOMMENDATION

The study should be done among more no. of patients to identify the trend of the outcome.

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