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EVALUATION OF THE CLINICAL OUTCOMES OF DAPAGLIFLOZIN IN HEART FAILURE PATIENTS WITH REDUCED EJECTION FRACTION-A SINGLE CENTER OBSERVATIONAL STUDY

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ABSTRACT

Heart failure is a global public health concern that occurs in more than 26 million people globally. The aim and objective of the study to evaluate effect of Dapagliflozin on improving ejection fraction in heart failure patients with reduced ejection fraction (HFrEF) and to check an secondary outcomes and quality of life in heart failure patients after the treatment. The study design is a prospective and retrospective single center observational study. It was conduct in Medicover hospitals (Tertiary care hospital), Hi-Tech city, Hyderabad with sample size 100 patients or more in the duration of 6 months. The results are evaluated as Dapagliflozin is commonly used in heart failure patients with reduced ejection fraction (HFrEF) — even in those without diabetes. The most common symptoms were SOB (56.86%), Chest pain (30.39%) and pedal edema (3.92%). The majority symptom and comorbidity associated with HFrEF was found to be SOB and HTN which was observed in 58 patients out of 102 patients. The most common comorbidity was HTN (53.92%), DM-2 (29.42%), CAD (4.90%), Hypothyroidism (4.90%). The impact of Dapagliflozin(10mg) in increasing LVEF % was increase from 38.87 % to 58.23 %. Majority of patients before the treatment with Dapagliflozin were observed a Grade 2 to Grade 4 with the analysement of symptoms by the reduction of this Dapagliflozin therapy overall a quality of life. The study was concluded as its positive effects on cardiac structure, symptoms, and metabolic parameters illustrate its value as an adjunct in managing heart failure, particularly in those with metabolic comorbidities.

KEYWORDS: Heart failure, Dapagliflozin, HTN, Ejection fraction and symptoms

INTRODUCTION

Heart failure (HF) is a complicated clinical illness caused by any anatomical or functional impairment of ventricular filling or blood ejection. Heart failure (HF) has a significant morbidity and mortality rate and is a prevalent condition globally. With an estimated 26 million cases globally, CHF lowers functional ability,

raises healthcare expenses, and has a major negative impact on quality of life.[1]

The following parameters are used to classify HF based on LVEF:

- **HF with reduced ejection fraction (HFrEF)**: LV EF ≤40%
- **HF with mildly reduced ejection fraction**: LVEF 41% to 49% and evidence of HF (spontaneous or provokable elevated cardiac biomarkers or elevated filling pressures)
- **HF with preserved ejection fraction (HFpEF)**: LVEF ≥50% and evidence of HF (spontaneous or provokable elevated cardiac biomarkers or elevated filling pressures)
- **HF with improved ejection fraction**: LV EF >40%, with previously documented LV EF ≤40%.[2]

Epidemiology

The Global Health Data Exchange registry indicates that there are currently 64.34 million cases of CHF worldwide. This amounts to 346.17 billion US dollars in healthcare costs and 9.91 million years lost as a result of incapacity. One of the main factors influencing HF is age. The prevalence of HF rises sharply with age, regardless of the cause or the criteria used to categorize patients with the condition. According to the Framingham Heart Study, the prevalence of CHF was 8 per 1000 males between the ages of 50 and 59 and rose to 66 per 1000 males between the ages of 80 and 89.[3,4]

After the age of 65, the incidence of heart failure doubles for males and triples for women in the same age group. Globally, heart disease and CHF are more common in males than in women.[5]

The global registry also notes a predilection for a race with a 25% higher prevalence of HF in Black patients than in White patients. HF is still the primary cause of hospitalization in the elderly population and accounts for 8.5% of cardiovascular-related deaths in the United States.[6]

Etiology

The etiologies of HF are extensive, though coronary artery disease (CAD) causing ischemic heart disease is the most common cause. The 4 most common etiologies responsible for about two-thirds of HF cases are ischemic heart disease, chronic obstructive pulmonary disease (COPD), hypertensive heart disease, and rheumatic heart disease. Higher-income countries have higher rates of ischemic heart disease and COPD; lower-income countries have higher rates of hypertensive heart disease, cardiomyopathy, rheumatic heart disease, and myocarditis.[7,8]

Pathophysiology

HF is a progressive illness whose compensatory mechanisms may be triggered by a variety of acute traumas or hereditary variables, resulting in maladaptation and chronic heart failure (CHF). Although the renin-angiotensin-aldosterone system (RAAS) and prolonged sympathetic activation cause maladaptive alterations including myocardial hypertrophy and increased oxygen demand, these mechanisms initially seek to sustain cardiac output. Cardiac output declines when myocyte death takes place, which starts a vicious cycle of neurohumoral hyperactivity and more heart damage. Peripheral vasoconstriction, elevated preload, and inefficient natriuretic peptide secretion are signs of decompensated CHF. Heart failure with decreased ejection fraction (HFrEF) and preserved ejection fraction (HFpEF) are the two types of CHF causes. Each requires a different approach to treatment, with HFpEF typically having a worse prognosis.[9,10]

RISK FACTORS

The occurrence of each risk factor there are coronary disease, hypertension, diabetes, obesity, smoking. Myocardial infarction, Coronary disease, hypertension and obesity.[11]

DIAGNOSIS

A physical examination to identify the presence of clinical symptoms and signs, blood tests such as complete blood count, urinalysis, complete metabolic profile, liver function tests, and thyroid-stimulating hormone are all used in the evaluation for heart failure.[12,13]

TREATMENT

In-Patient Management of HF

It is advised to admit the patient in the telemetry bed or in ICU and the treatment is based on the following points. Monitor oxygen, Provide noninvasive positive pressure ventilation (NIPPV) in the few cases. The following pharmacological agents depending on the precipitating factors and symptoms/signs for congestion Diuretics, Angiotensin-converting enzyme inhibitors (ACEIs) or angiotensin receptor blockers (ARBs) for neuro-hormonal modification, vasodilatation and improvement in LVEF (substitute them with hydralazine and/or nitrates in patients unresponsive to ACEIs and ARBs), Beta-adrenergic blockers and Aldosterone antagonists.[14,15]

Out-Patient Management of HF

Education, counseling, Early attention to signs and symptoms, behavioral strategies and assistance with social and financial concerns.[16,17]

AIM AND OBJECTIVE

The aim and objective to evaluate the clinical outcomes of dapagliflozin in heart failure patients with reduced ejection fraction.

METHODOLOGY

The study design is a prospective & retrospective single centre observational study in the site of research in Medicover hospitals (Tertiary care hospital), Hi-Tech

city, Hyderabad. The sample size of population are enrolled a 100 patients in the study by the conduct of 6 months of period of the study before a study the IEC got an approval from the Institutional Ethics committee of Medicover Hospital. The population of the study was enrolled a voluteersbased on inclusion and exclusion criteria. The inclusion criteria are LVEF of 35% or less, Elevated natriuretic peptide levels; for patients in sinus rhythm NT-pro BNP ≥1,000 pg/ml; for those in atrial fibrillation, Evidence of structural heart disease, NYHA class – II, III, IV and Treatment with drugs like ARB, ACE-I, Arni's, MCRA's and exclusion criteria is excluded a vounteer in the research study such as Previous intolerance to SGLT-2 inhibitors, Severe kidney impairment eGFR <30 ml/ min/1.73 m^2 of body surface, myo-pericarditis and hypertrophic cardiomyopathy and pregnant, lactating women, Paediatric patients. The stastical data was used as a software in version 23.0 was used as tables, figure, pie diagrams and sum of calculation of percentage yield.

RESULTS

In a tertiary care hospital, a retrospective and prospective observational study was carried out to assess the clinical outcomes of dapagliflozin in heart failure patients with reduced ejection fraction. A total of 102 patients were included in this investigation.

Table-1: Distribution of data based on age.

AGE	NO. OF PATIENTS	PERCENTAGE (%)
21-40	7	6.86
41-60	47	46.08
61-80	43	42.15
80-100	3	2.95
TOTAL	**102**	**100**

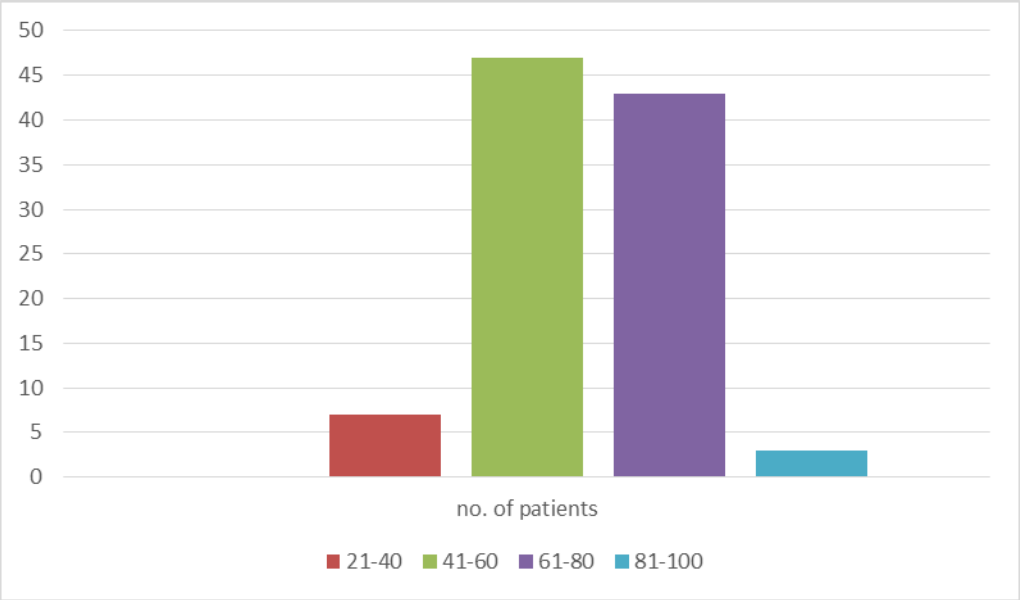

Figure 1: Distribution of data based on age.

The table presents the age-wise distribute on of 102 patients. The majority of patients fall within the 41-60 age group (46.07%), followed by the 61-80 age group (42.15%). Very few patients were from the 80-100 (2.94%) age range.

The bar graph visually represents the data from the table, showing a peak in the 41-60 and 61-80 age groups, indicating a higher prevalence of the condition among middle-aged and elderly patients.

Table 2: Overall gender analysis.

GENDER	NO. OF PATIENTS	PERCENTAGE (%)
MALE	73	71.57
FEMALE	29	28.43
TOTAL	**102**	**100**

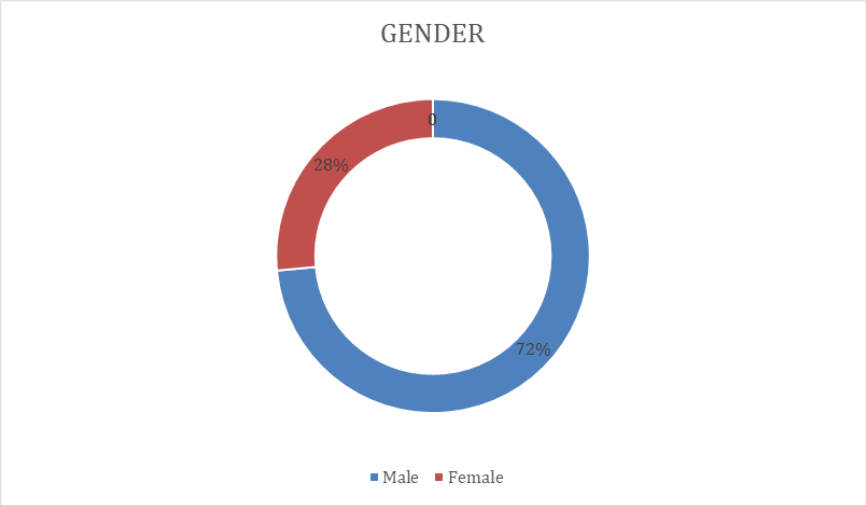

Figure 2: Overall gender analysis.

The table shows the gender distribution of 102 patients that were included in the study, of which 73 patients (71.57%) are males and 29 patients (28.43%) are females.

The donut chart visually represents the higher proportion of males.

Table 3: Distribution based on symptoms.

SYMPTOM	NO. OF PATIENTS	PERCENTAGE (%)
Shortness of breath	58	56.86
Chest pain	31	30.39
Sweating	3	2.95
Giddiness	2	1.96
Pedal edema	4	3.92
Cough	2	1.96
Other	2	1.96
TOTAL	**102**	**100**

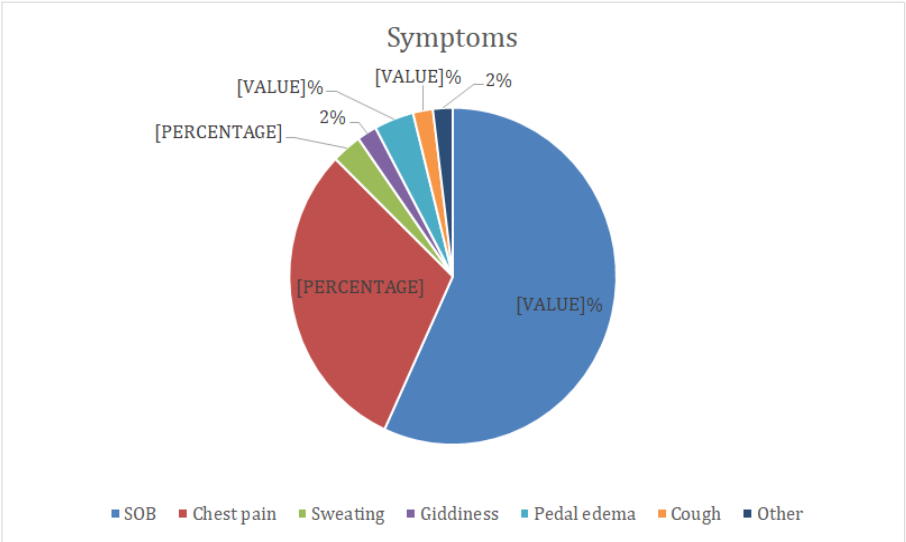

Figure 3: Distribution of data based on symptoms.

The table and pie chart illustrates the distribution of various symptoms of heart failure among 102 patents.

Shortness of breath (56.86%) and chest pain (30.39%) being the most common of all the symptoms. Less frequent symptoms include sweating, giddiness, pedal edema, cough and others. Unanimous symptoms like neck pain and decreased responsiveness are included in others.

Table 4: Distribution of data based on comorbidities.

COMORBIDITY	NO. OF PATIENTS	PERCENTAGE (%)
Hypertension	55	53.92
Diabetes mellitus type 2	30	29.42
Dilated cardiomyopathy	2	1.96
Coronary artery disease	5	4.90
Myocardial infarction	1	0.98
Hypothyroidism	5	4.90
Acute kidney injury	4	3.92
TOTAL	**102**	**100**

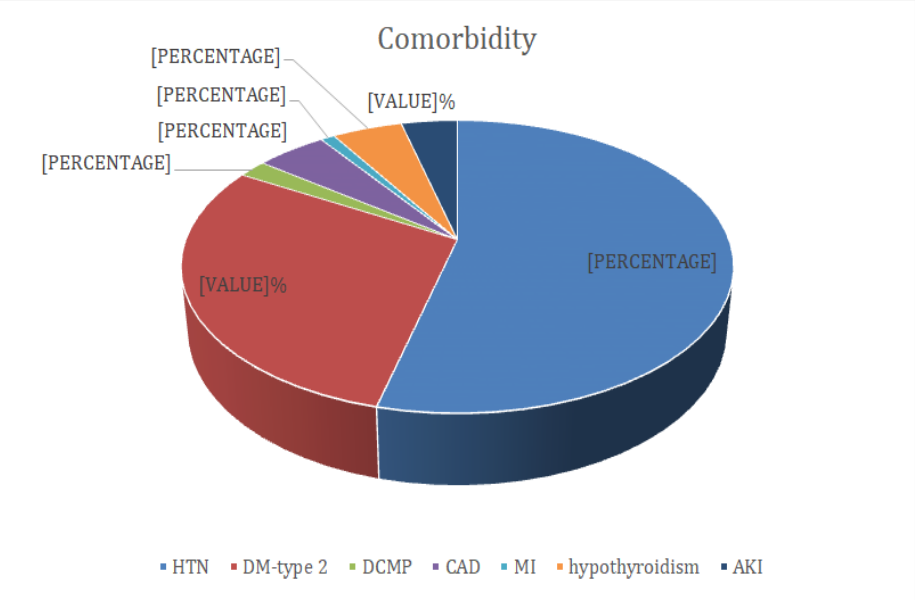

Figure 4: Distribution of data based on comorbidities.

The table depicts distribution of comorbidities among 102 patients, with hypertension (53.92%) and diabetes mellitus type 2 (29.42%) being the most prevalent conditions. The pie chart visually reinforces this by showing larger segments for these two conditions compared to smaller slices representing less common comorbidities.

Table 5: Distribution of data based on Weight.

Parameter	Mean before	Mean after
Weight (kgs)	77.31	74.64

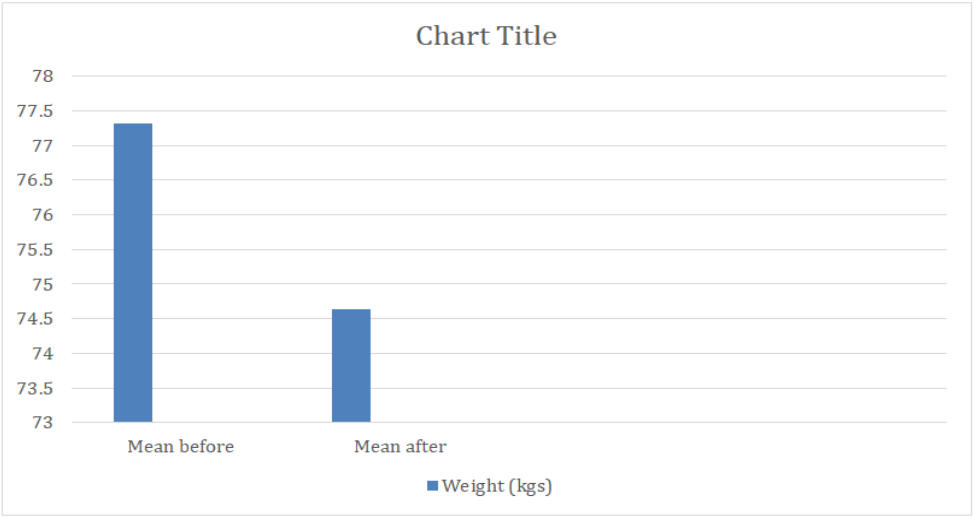

Figure 5: Distribution of data based on Weight.

The table and bar graph show a reduction in mean body weight from 77.31 kg to 74.64 kg after intervention. This indicates a weight loss of 2.67 kg. The reduction highlights the impact of dapagliflozin use in heart failure patients, contributing significantly to weight management.

Table-6: Mean distribution of patients before and after the treatment with Dapagliflozin according to ECHO-LVEF%.

Parameter	Mean before	Mean after
ECHO-LVEF %	38.87	58.23

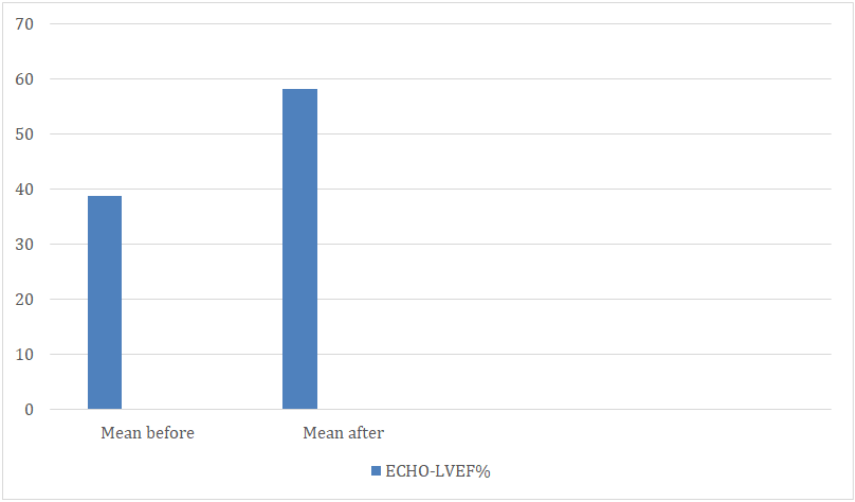

Figure 6: Mean distribution of patients before and after the treatment with Dapagliflozin according to ECHO-LVEF%.

The table and bar graph represents the mean ECHO-LVEF % before and after Dapagliflozin treatment.

Mean before bar stands at 38.87% indicating reduced ejection fraction indicative of Heart Failure with reduced Ejection Fraction. Mean after bar rises significantly to about 58.23% indicating notable improvement in cardiac function. A total of 19.35% increase is seen in LVEF%.

Table 7: Mean distribution of patients before and after the treatment with Dapagliflozin according to HbA1c levels.

Parameter	Mean before	Mean after
HbA1c	6.09	5.47

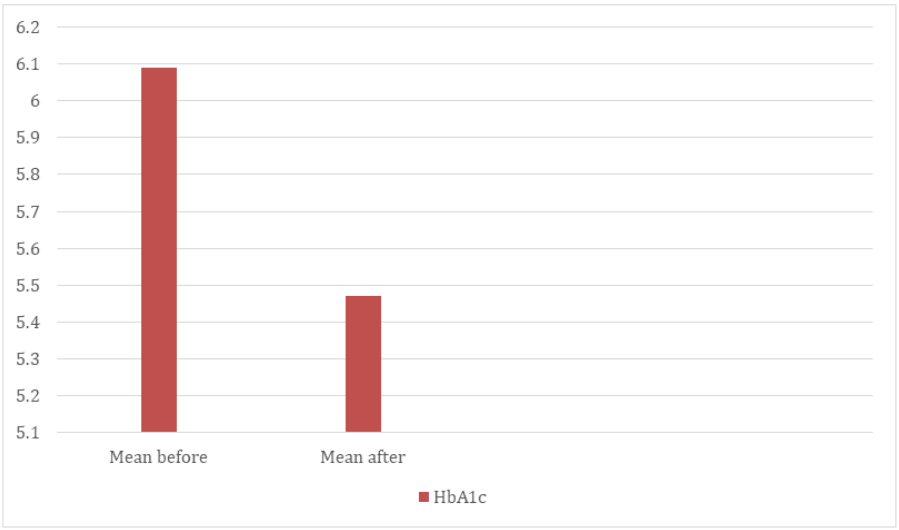

Figure 7: Mean distribution of patients before and after the treatment with Dapagliflozin according to HbA1c levels.

The table and bar graph represents the mean HbA1c values before and after treatment with Dapagliflozin.

Mean before bar is at 6.09% which indicates poor glycaemic control, mean after bar drops to 5.47% indicating a substantial improvement in glycaemic status.

Table 8: Mean distribution of patients before and after the treatment with Dapagliflozin according to Serum creatinine and Serum urea levels.

Parameter	Mean before	Mean after
Serum urea	40.12	24.7
Serum Creatinine	1.25	0.96

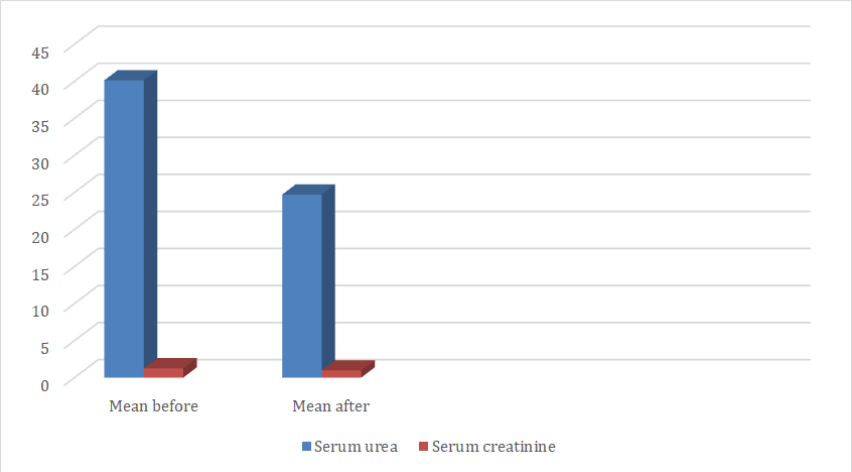

Figure 8: Mean distribution of patients before and after the treatment with Dapagliflozin according to Serum creatinine and Serum urea levels.

The table and bar graph represents the mean values of serum urea and serum creatinine before and after treatment with Dapagliflozin.

Blue barsrepresenting Serum urea shows a significant decrease in mean valuesfrom 40.12mg/dl to 24.7mg/dl, and orange bars representing serum creatinine shows a reduction in mean values from 1.25mg/dl to 0.96mg/dl.

Table-9: Mean distribution of patients before and after the treatment with Dapagliflozin according to Serum sodium and Serum potassium levels.

Parameter	Mean before	Mean after
Serum Sodium	136.81	139.19
Serum Potassium	4.63	4.17

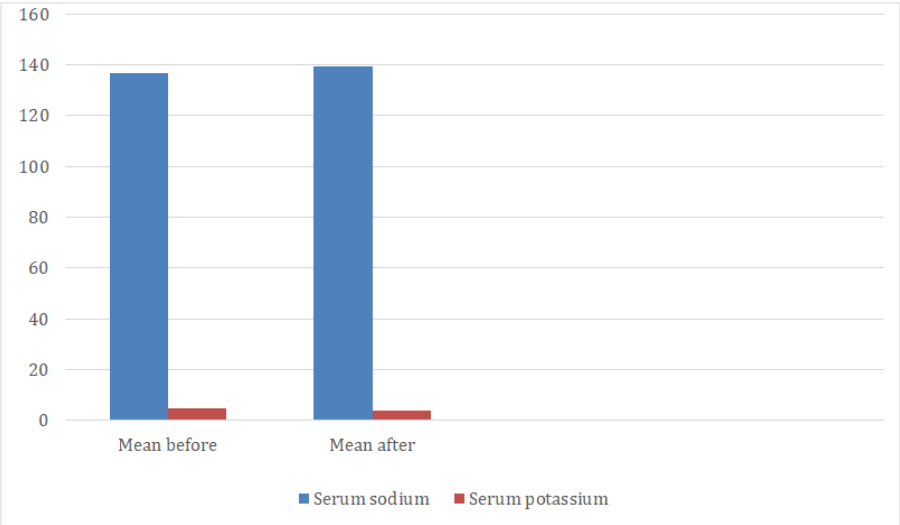

Figure 9: Mean distribution of patients before and after the treatment with Dapagliflozin according to Serum sodium and Serum potassium levels.

The table and bar graph illustrates the before and after mean values for both serum sodium and serum potassium.

Serum sodium (blue prtion) increased from 136.81 to 139.19mmol/L indicating improvement towards normal physiological range (135-145 mmol/L).

Serum potassium (orange portion) dropped from 4.63 to 4.17 mmol/L, which reflects an improvement towards normal physiological range.

Table 10: Mean distribution of patients before and after the treatment with Dapagliflozin according to NT-proBNP levels.

Parameter	Mean before	Mean after
NT-proBNP	9725.53	4473.65

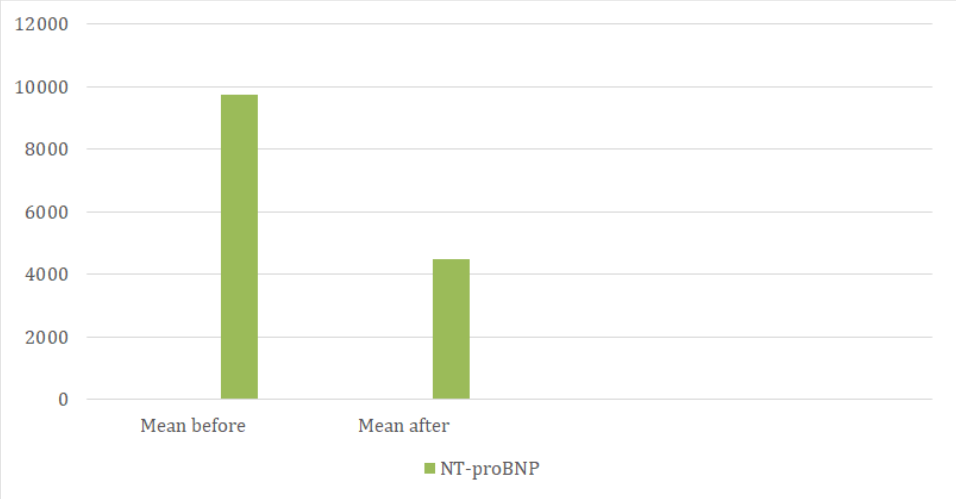

Figure 10: Mean distribution of patients before and after the treatment with Dapagliflozin according to NT-proBNP levels.

The bar graph shows a substantial decrease in mean NT-proBNP levels after treatment with dapagliflozin. The mean value before treatment was over 9000 pg/mL, which dropped to below 5000 pg/mL post-treatment.

NT-proBNP is a biomarker for heart failure severity. A notable reduction after dapagliflozin treatment indicates improvement in cardiac function and reduced ventricular stress in patients.

Table-11: Mean distribution of patients before and after the treatment with Dapagliflozin according to SGPT, SGOT levels.

Parameter	Mean before	Mean after
SGPT	28.43	26.15
SGOT	31.02	29.21

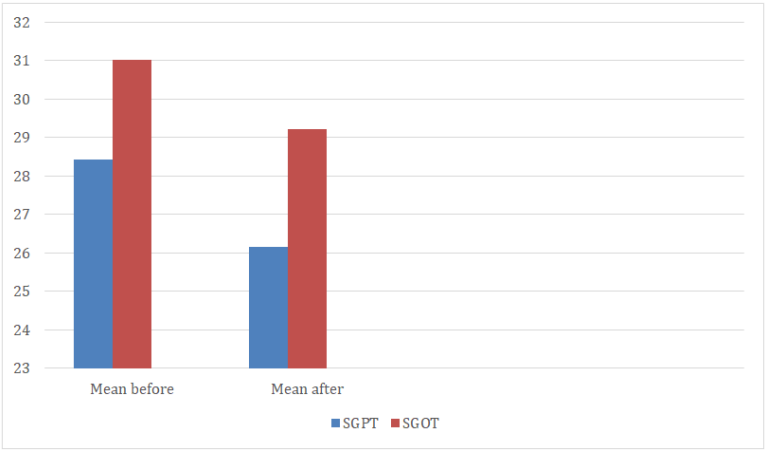

Figure 11: Mean distribution of patients before and after the treatment with Dapagliflozin according to SGPT, SGOT levels.

The table and bar graph illustrates the before and after mean values for both liver enzymes Serum Glutamate Pyruvate Transaminase (SGPT)& Serum Glutamate Oxaloacetate (SGOT).

For patients treated with Dapagliflozin, the mean SGPT levels decreased from 28.43 U/L before the treatment to 26.15 U/L after the treatment, representing a reduction of 2.28 U/L.

The mean SGOT levels decreased from 31.02 U/L before treatment to 29.21 U/L after treatment, representing a reduction of 1.81 U/L. This indicates slight improvement in Liver function.

Table-12: Mean distribution of patients before and after the treatment with Dapagliflozin according to LV Dimensions: EDD values.

Parameter	Mean before	Mean after
LV Dimensions: EDD	5.25	4.57

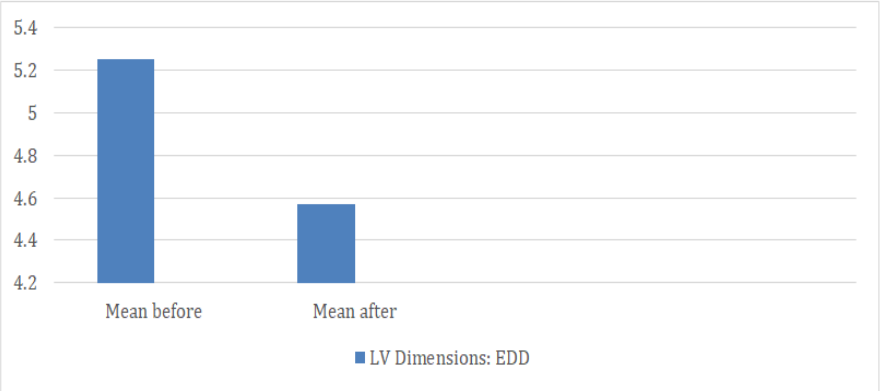

Figure 12: Mean distribution of patients before and after the treatment with Dapagliflozin according to LV Dimensions: EDD values.

The table and bar graph represents the mean EDD values before and after treatment with Dapagliflozin.

The bar graph gives visual representation of Mean Left Ventricular (LV) End-Diastolic Dimension (EDD) values before and after treatment with Dapagliflozin.

The mean EDD decreased from approximately 5.3cm to 4.6 cm showing a reduction of 0.7cm, this significant decrease indicates improvement in cardiac structure and reversal of ventricular dilation.

Table-13: Mean distribution of patients before and after the treatment with Dapagliflozin according to LV Dimensions: IVSD values.

Parameter	Mean before	Mean after
LV Dimensions: IVSD	0.96	0.82

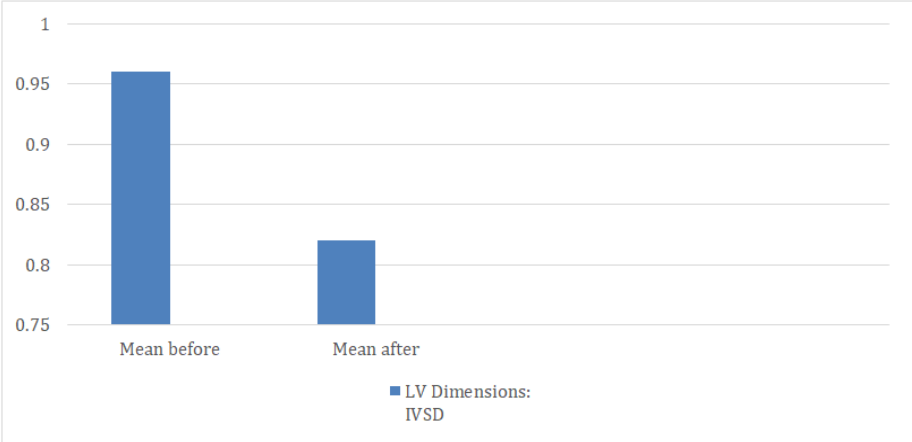

Figure 13: Mean distribution of patients before and after the treatment with Dapagliflozin according to LV Dimensions: IVSD values.

The table and bar graph represents the mean Interventricular Septal Dimension (IVSD) values before and after treatment with Dapagliflozin.

The mean IVSD decreased from 0.96 cm before treatment to 0.82 cm after treatment, showing a reduction of 0.14 cm.

This decline suggests a positive remodelling effect on the interventricular septum, indicating improved cardiac structure and reduced myocardial thickness following dapagliflozin therapy.

Table-14: Mean distribution of patients before and after the treatment with Dapagliflozin according to LV Dimensions: ESD values.

Parameter	Mean before	Mean after
LV Dimensions: ESD	3.76	3.06

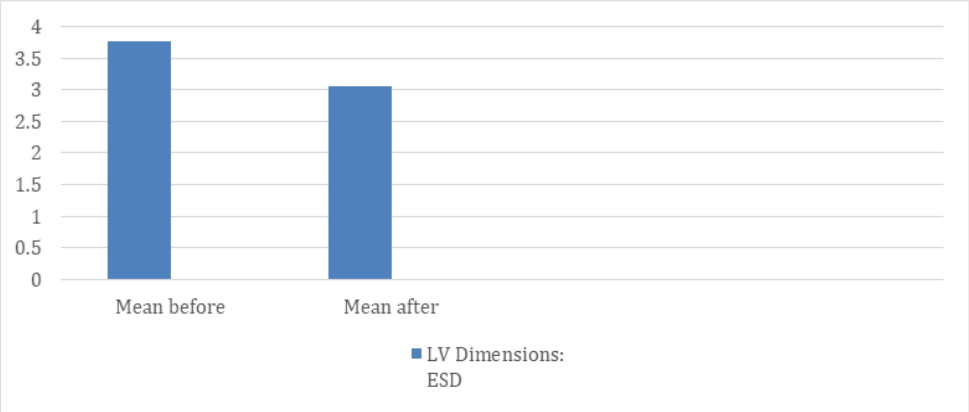

Figure 14: Mean distribution of patients before and after the treatment with Dapagliflozin according to LV Dimensions: ESD values.

The table and bar graph display the mean Left Ventricular End-Systolic Dimension (ESD) values before and after treatment with Dapagliflozin.

The mean ESD decreased from 3.76 cm before treatment to 3.06 cm after treatment, indicating a reduction of 0.7 cm.

This significant reduction suggests improved left ventricular systolic function and favourable cardiac remodelling following dapagliflozin therapy.

Table-15: Mean distribution of patients before and after the treatment with Dapagliflozin according to LV Dimensions: PWD values.

Parameter	Mean before	Mean after
LV Dimensions: PWD	0.97	0.86

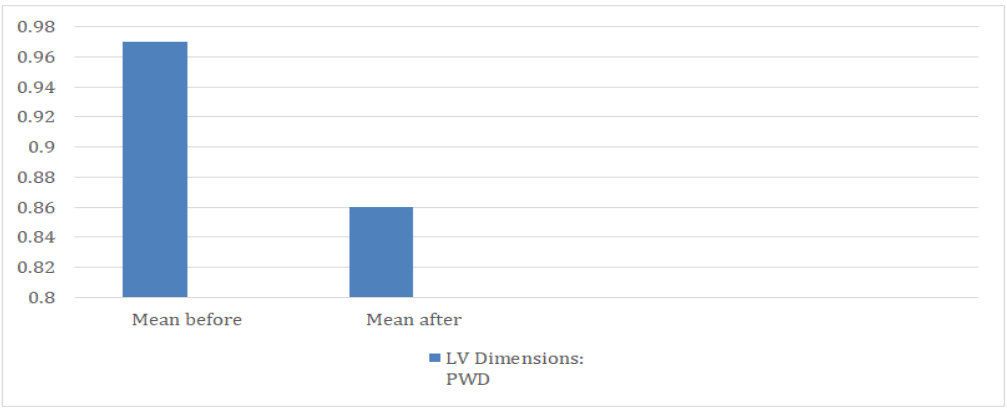

Figure 15: Mean distribution of patients before and after the treatment with Dapagliflozin according to LV Dimensions: PWD values.

The bar graph presents the mean Posterior Wall Dimension (PWD) of the left ventricle before and after treatment with Dapagliflozin.

The mean PWD decreased from approximately 0.97 cm before treatment to around 0.86 cm after treatment, showing a reduction of 0.12 cm.

This decline reflects favorable changes in ventricular wall thickness, indicating reduced myocardial stress and improved cardiac remodeling due to dapagliflozin therapy.

Table-16: Mean distribution of patients before and after the treatment with Dapagliflozin according to E/A ratio values.

Parameter	Mean before	Mean after
E/A ratio	1.33	0.92

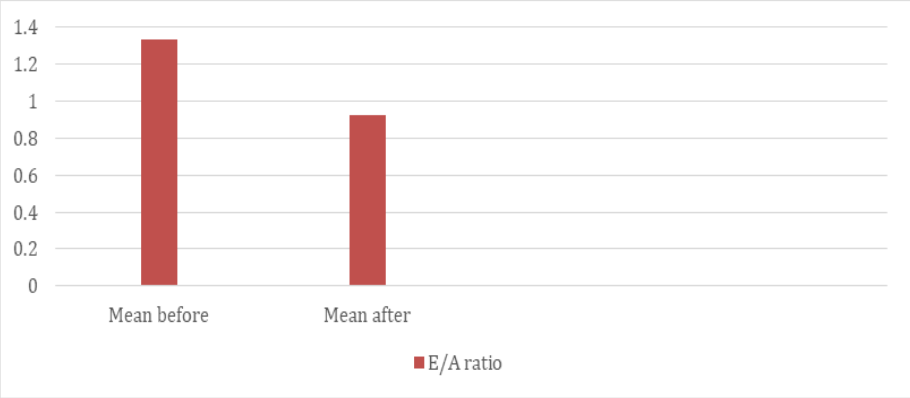

Figure 16: Mean distribution of patients before and after the treatment with Dapagliflozin according to E/A ratio values.

The table and bar graph show the mean E/A ratio (early to late ventricular filling velocities) before and after treatment with Dapagliflozin.

The mean E/A ratio decreased from 1.33 before treatment to 0.92 after treatment, indicating a reduction of 0.41.

This significant drop suggests improvement in diastolic function, reflecting better ventricular relaxation and filling after dapagliflozin therapy.

Table-17: Distribution of data based on NYHA Classification before and after treatment with Dapagliflozin.

NYHA Classification	No. of patients before treatment	No. of patients after treatment
GRADE I	0	88
GRADE II	47	14
GRADE III	40	0
GRADE IV	15	0
TOTAL	102	102

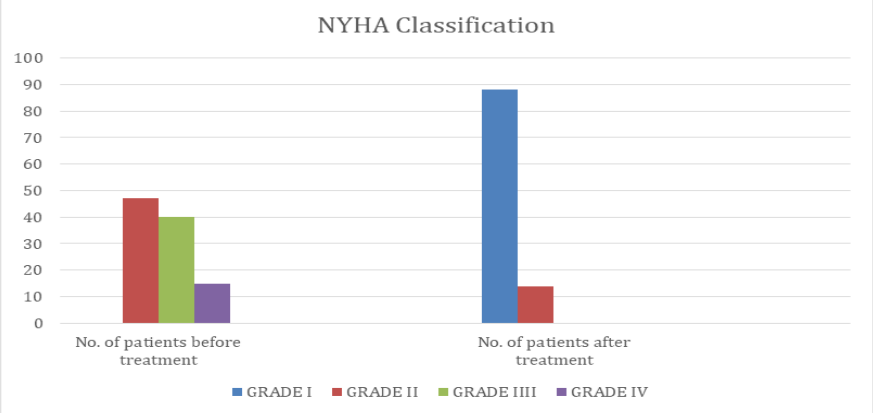

Figure 17: Distribution of data based on NYHA Classification before and after treatment with Dapagliflozin.

The table and bar graph display the NYHA (New York Heart Association) classification of patients before and after treatment with Dapagliflozin, reflecting the severity of heart failure symptoms.

Before treatment, the majority of patients were in Grade II (47 patients) and Grade III (40 patients), with (15 patients) in Grade IV, indicating moderate to severe heart failure symptoms.

After treatment, a significant improvement was observed, with 88 patients shifted to Grade I and only 14 remaining in Grade II. There were no patients in Grade III or IV post-treatment. This dramatic shift in NYHA classification demonstrates that Dapagliflozin effectively improved functional capacity and reduced symptoms in patients with heart failure with reduced ejection fraction (HFrEF), enhancing their overall quality of life.

DISCUSSION

The retrospective and prospective observational study was conducted to assess the clinical outcomes of dapagliflozin in heart failure patients with reduced ejection fraction. It was a single centre study conducted in a tertiary care hospital for a period of 6 months where 103 individuals were enrolled.

Heart failure with reduced ejection fraction (HFrEF), occurs when the heart's left ventricle is weakened and can't pump enough blood out to the body.

Dapagliflozin is commonly used in heart failure patients with reduced ejection fraction (HFrEF) — even in those without diabetes.

The distribution of patients based on associated symptoms accompanying their chief complaints of HFrEF symptoms is presented in the provided table and graph. The most common symptoms were SOB (56.86%), Chest pain (30.39%) and pedal edema (3.92%) While the least common symptoms were Sweating, Giddiness, Cough, and Others.

The majority symptom associated with HFrEF was found to be SOB which was observed in 58 patients out of 102 patients. The distribution of patients based on associated comorbidities accompanying HFrEF is presented in the provided table and graph. The most common comorbidity was HTN (53.92%), DM-2 (29.42%), CAD (4.90%), Hypothyroidism (4.90%). The least common comorbidities were Dilated cardiomyopathy, Myocardial infarction, Acute kidney injury.

The majority comorbidity associated with HFrEF was found to be HTN which was observed in 55 patients out of 102 patients.

In the present study, the impact of Dapagliflozin on body weight was assessed by comparing mean values before and after treatment. The results showed a reduction in mean body weight from 77.31 kg to 74.64 kg after intervention. This indicates a weight loss of 2.67 kg. The reduction highlights the impact of dapagliflozin use in heart failure patients, contributing significantly to weight management.

In the present study, the impact of Dapagliflozin(10mg) in increasing LVEF % was assessed by comparing mean values before and after treatment. The results showed a significant improvement in LVEF %. Dapagliflozin demonstrated a mean increase from 38.87 % to 58.23 %, representing a 19% increase in LVEF %. These findings suggest that Dapagliflozin is effective in improving LVEF %.

In the study, the effect of Dapagliflozin on HbA1c was assessed by comparing mean values before and after treatment. For patients receiving Dapagliflozin, the mean HbA1c level decreased from 6.09 % before treatment to 5.47 % after treatment, representing a reduction of 0.63 %. These results suggest Dapagliflozin is effective in indicating a substantial improvement in glycaemic status.

In the study, the effect of Dapagliflozin on Sr. Creatinine levels was evaluated. For patients with Dapagliflozin, the mean Sr. Creatinine levels decreased from 1.25 mg/dl before treatment to 0.96mg/dl after treatment, resulting in a reduction 0.29mg/dl. This result indicates the slight improvement in renal function after using Dapagliflozin.

In the study, the effect of Dapagliflozin on Sr. Urea levels was evaluated. For patients with Dapagliflozin, the mean Sr. Urea levels decreased from 40.12 mg/dl before treatment to 24.7 mg/dl after treatment, resulting in a reduction 15.42mg/dl. This result indicates the improvement in renal function after using Dapagliflozin.

In the study, the effect of Dapagliflozin on sodium and potassium levels was evaluated. For patients with Dapagliflozin, the mean Sr. Sodium levels increased from 136.81 mmol/L before treatment to 139.19 mmol/L after treatment, resulting in a slight increase of 2.37 mmol/L, indicating improvement towards normal physiologicalrange. And the Sr. Potassium levels decreased from 4.63 mmol/L before treatment to 4.17 mmol/L after treatment, resulting in a slight reduction, which reflects a correction of hyperkalaemia.

In the study, the effect of Dapagliflozin on NT-PRO BNP levels were assessed. For patients treated with Dapagliflozin, the mean NT-PRO BNP levels decreased from 9725.53 pg/ml before treatment to 4473.65 pg/ml after treatment, representing a reduction of 5251.88 pg/ml. This notable reduction after dapagliflozin treatment indicates improvement in cardiac function and reduced ventricular stress in patients.

In the present study, the effect of Dapagliflozin on SGPT and SGOT levels were assessed. For patients treated with Dapagliflozin, the mean SGPT levels decreased from

28.43 U/L before the treatment to 26.15 U/L after the treatment, representing a reduction of 2.28 U/L. The mean SGOT levels decreased from 31.02 U/L before treatment to 29.21 U/L after treatment, representing a reduction of 1.81 U/L. This indicates improvement in Liver function.

In the study, the impact of Dapagliflozin on LV Dimension: EDD (End-Diastolic Dimension) levels were assessed. For patients treated with Dapagliflozin, the mean LV-EDD levels decreased from 5.25 cm before treatment to 4.57 cm after treatment, representing a reduction of 0.68cm. This significant decrease indicates improvement in cardiac structure and reversal of ventricular dilation.

In the study, the effect of Dapagliflozin on LV Dimension: IVSD (Interventricular Septal Dimension) levels were assessed. For patients treated with Dapagliflozin, the mean LV-IVSD levels decreased from 0.96 cm before treatment to 0.82 cm after treatment, representing a reduction of 0.14 cm. This decline suggests a positive remodelling effect on the interventricular septum, indicating improved cardiac structure and reduced myocardial thickness following dapagliflozin therapy.

In the present study, the impact of Dapagliflozin on LV Dimension: ESD (End-Systolic Dimension) levels were assessed. For patients treated with Dapagliflozin, the mean LV-ESD levels decreased from 3.76 cm before treatment to 3.06 cm after treatment, representing a reduction of 0.7 cm. This significant reduction suggests improved left ventricular systolic function and favourable cardiac remodelling.

In the study, the effect of Dapagliflozin on LV Dimension: PWD (Posterior Wall Dimension) levels were assessed. For patients treated with Dapagliflozin, the mean LV-PWD levels decreased from 0.97 cm before treatment to 0.86 cm after treatment, representing a reduction of 0.11 cm, which corresponds to a percentage decrease of 12.24%. This decline reflects favourable changes in ventricular wall thickness, indicating reduced myocardial stress and improved cardiac remodelling due to dapagliflozin therapy.

In the study, the effect of Dapagliflozin on E/A (early to late ventricular filling velocities) ratio levels were assessed. For patients treated with Dapagliflozin, the mean E/A ratio levels decreased from 1.33 before treatment to 0.92 after treatment, representing a reduction of 0.41, which corresponds to a percentage decrease of 30.8%. This significant drop suggests improvement in diastolic function, reflecting better ventricular relaxation and filling after dapagliflozin therapy.

In the present study, the impact of Dapagliflozin on NYHA Classification was assessed. Majority of patients before the treatment with Dapagliflozin were Grade 2(47 patients) and Grade 3(40 patients), with (15 patients) in Grade 4 indicating Moderate to Severe Heart Failure symptoms. Majority of patients after the treatment with Dapagliflozin were in Grade 1(88 patients) and Grade 2(14 patients) with NO patients in Grade 3 and 4. This dramatic shift in NYHA classification demonstrates that Dapagliflozin effectively improved functional capacity and reduced symptoms in patients with heart failure with reduced ejection fraction (HFrEF), enhancing their overall quality of life.

CONCLUSION

The study was concluded as Heart failure (HF) fundamentally impairs the heart's ability to pump blood effectively through Reduced Ejection fraction and structural changes. Treatment with Dapagliflozin led to marked enhancements in heart failure patients: improvements in cardiac function (such as increased ejection fraction and reduced left ventricular dimensions) and a substantial reduction in symptom severity (with most patients shifting to NYHA Grade I after therapy). Dapagliflozin therapy not only improved heart failure symptoms but also beneficially impacted comorbidities, showing reductions in blood glucose (HbA1c), serum urea, creatinine, and NT-proBNP levels, while also correcting hyperkalaemia. No worsening of renal or hepatic function was observed. Dapagliflozin proved effective, regardless of age or gender. Its positive effects on cardiac structure, symptoms, and metabolic parameters illustrate its value as an adjunct in managing heart failure, particularly in those with metabolic comorbidities.

CONFLICT OF INTEREST

The author were no the conflict of interest.

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