

Empagliflozin and Dapagliflozin in Improving Ejection Fraction: A Prospective Observational Comparison of Clinical Outcomes and Patient Reported Quality of Life

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Abstract

Background

SGLT2 inhibitors have transformed heart failure treatment, especially empagliflozin and dapagliflozin. Although both have proven cardiovascular benefits in clinical trials, there is little data comparing them in real-world settings. This study aims to address that by comparing their effects on heart function, lab tests, echocardiography, and quality of life using routine clinical data and the Kansas City Cardiomyopathy Questionnaire-12.

Methods

We conducted a prospective observational study with 70 heart failure patients, evenly divided between those taking empagliflozin 10 mg daily and those on dapagliflozin 10 mg daily as part of their usual care. We collected vital signs, blood tests, echocardiographic measures, including left ventricular ejection fraction, and KCCQ-12 scores. Statistical analysis included t-tests, Mann-Whitney U, Chi-square, ANOVA, Shapiro-Wilk for normality, Levene's test for equal variances, and Pearson correlation. Results with p-values under 0.005 were considered significant.

Results

The groups were similar in age, gender, rates of hypertension, HbA1c, and lipid levels. However, more patients in the dapagliflozin group had diabetes (68.6% vs. 31.4%, $p = 0.007$). Both drugs significantly lowered systolic blood pressure and improved ejection fraction. Dapagliflozin caused a larger drop in sodium levels (2.51 vs 0.83 mEq/L, $p = 0.007$). Among diabetic patients, empagliflozin reduced blood glucose by a greater amount (-75.00 vs -42.33 mg/dL). Patients on empagliflozin also had higher overall KCCQ-12 scores (66.22 vs. 56.06), with a significant difference in symptom frequency ($p = 0.033$). Improvements in ejection fraction, kidney function, hemoglobin, and lipids were similar for both drugs.

Conclusions

Empagliflozin and dapagliflozin showed similar effects in heart failure patients, though some important differences emerged. Empagliflozin was associated with greater reductions in KCCQ-12 symptom frequency scores and blood sugar levels in patients with diabetes, whereas dapagliflozin was associated with a larger drop in serum sodium levels. These results suggest that although both drugs are generally equivalent, individual differences might guide personalized treatment choices.

INTRODUCTION

Heart failure is arguably the most burdensome of all the major clinical syndromes we treat in the modern era of medicine. It has remained so for decades, despite major advances in its management, to the extent that it still leads to hospitalization, premature death, and diminished quality of life on a large scale¹. The pharmacological management of heart failure, as recommended by guidelines, has, over the years, progressively incorporated the use of angiotensin-converting enzyme inhibitors, angiotensin receptor neprilysin inhibitors, beta blockers, and mineralocorticoid receptor antagonists, among the drugs, but the prognosis of patients with heart failure has remained poor, especially despite the optimal use of the above drugs^{2,3}. The introduction of SGLT2 inhibitors has revolutionized the management of heart failure to a large extent, as these drugs were originally intended for the management of type 2 diabetes mellitus but were surprisingly found to have a positive impact on the heart, independent of glucose metabolism⁴.

The key evidence comes from two landmark clinical trials. The DAPA-HF trial found that the drug reduced the composite risk of worsening heart failure and death by 26% compared with the placebo, and the effect was seen regardless of the presence or absence of diabetes⁵. The EMPEROR-Reduced trial yielded similar results for the drug empagliflozin, showing significant reductions in heart failure hospitalizations and cardiovascular death⁶. The DELIVER and EMPEROR-Preserved trials were conducted to show the effect of the drugs even when the ejection fraction was not severely reduced, but only mildly or preserved⁷.

Yet, despite this solid body of evidence supporting both drugs, the two have never been compared prospectively. In real-life settings, the choice between them has to be made mostly based on indirect evidence, cost, and availability. The South Asian population also has its own set of complexities in terms of its cardiovascular risk profile and high prevalence of diabetes and associated comorbid conditions. In addition to hard clinical endpoints, there has been a growing realization that how patients feel is as important as their performance on objective parameters. This is where questionnaires like the KCCQ-12 have become important. The KCCQ-12 is a patient-reported measure that reflects the four aspects of heart failure that patients consider most important⁸.

Thus, this study was designed to compare and evaluate these two SGLT-2 inhibitors head-to-head in a tertiary care cardiology setting in India, including hemodynamic responses, metabolic and renal laboratory parameters, echocardiographic ejection fraction, lipid profiles, medication regimens, and patient-reported outcomes using the KCCQ-12 tool^{9,10}. This study represents one of the first head-to-head prospective studies in this context.

MATERIALS AND METHODS

Study Design and Setting

A prospective observational study was conducted in the department of cardiology in a tertiary care teaching hospital between September 2025 and March 2026. The Institutional Ethics Committee

approved the study before patient enrolment, and all patients provided informed consent. This study is not a clinical trial but an observational study in which the drugs of interest were not prescribed explicitly for the study. The idea for the study emerged during routine ward rounds, when both SGLT2 inhibitors were being prescribed to the patients.

Study Population

We included 70 patients who were admitted with heart failure based on the inclusion criteria. This included patients with HFrEF, and some patients with right-sided heart failure. The cardiologist in charge of each patient prescribed an SGLT2 inhibitor as part of routine care. We included 35 patients who received empagliflozin (Group I) and 35 who received dapagliflozin (Group II).

The study included patients aged 18 years or older with heart failure, as defined by ESC/ACC/AHA criteria, who were prescribed an SGLT2 inhibitor as part of routine care during their hospitalization solely to improve ejection fraction, and who had baseline and follow-up information available. We excluded patients who had an eGFR of less than 30 ml/min/1.732 m², had type 1 diabetes, had prior use of an SGLT2 inhibitor, had active malignancy, had severe hepatic impairment, were pregnant or lactating, or were unable to give consent.

Data Collection

Demographic data, comorbid history, and concomitant medications were noted at the time of admission. Vital parameters, including systolic and diastolic blood pressure, pulse rate, respiratory rate, oxygen saturation, and temperature, were noted at the time of initiation of the SGLT2 inhibitor and at the time of discharge. Blood parameters included a full blood count, blood urea, serum creatinine, uric acid, serum electrolytes (sodium, potassium, chloride), HbA1c, and random blood sugar. Ejection fraction was measured by 2D echocardiogram using the biplane Simpson method at baseline and at discharge.

Quality of Life Assessment – KCCQ-12

The KCCQ-12 was administered to all patients after 3 months of initiation of SGLT2 inhibitor therapy. The KCCQ-12 has four domains. These domains are Physical Limitation, Symptom Frequency, Quality of Life, and Social Limitation. Each item has a score ranging from 0 to 100. Higher scores indicate better health. The score for each domain is the mean of the individual item scores. The Overall Summary Score is the equally weighted mean of the four domains. The KCCQ-12 has been well-validated in heart failure patients and demonstrates high internal consistency.

Statistical Analysis

Data were analyzed using R (version 4.5.0). Continuous variables are presented as mean plus or minus standard deviation; categorical variables as counts and percentages. All continuous outcomes were first tested for normality using the Shapiro-Wilk test, and Levene's test was used to assess variance equality between groups. When data were normally distributed, we used independent-samples t-tests for between-group comparisons and paired t-tests for within-group pre-post changes. For variables that violated normality assumptions, we used the Mann-Whitney U test for between-group comparisons. Categorical variables were compared with the chi-square test, applying Fisher's exact correction when any expected cell count fell below 5. One-way ANOVA compared EF change across age strata. Pearson correlation coefficients were calculated for all relevant continuous variable pairs. All significance tests were two-tailed, with $p < 0.05$ considered significant.

RESULTS

Baseline Demographics and Clinical Characteristics

The two groups were closely matched at baseline across most characteristics. Mean age was 58.63 ± 14.59 years in the dapagliflozin group and 56.49 ± 15.87 years in the empagliflozin group, a non-significant difference ($t = 0.588$, $p = 0.558$). Both groups had an identical sex distribution, with 28 men (80%) and 7 women (20%) each ($p = 1.000$). Hypertension was more prevalent in the dapagliflozin group (62.9% vs 45.7%), though the difference did not reach significance ($p = 0.230$).

The one meaningful baseline imbalance was in diabetes prevalence. Nearly 69% of dapagliflozin patients had diabetes mellitus, compared with 31% in the empagliflozin group ($p = 0.007$). This difference is an important confounder for glucose-related outcomes and is discussed accordingly. HbA1c values were numerically higher in the dapagliflozin group ($7.26 \pm 2.04\%$ vs $6.70 \pm 2.33\%$), though this did not achieve significance ($p = 0.290$). Baseline ejection fraction, renal parameters, hemoglobin, and lipid profiles were comparable.

Concomitant Medications

Several concomitant drug classes differed significantly between groups. Anticoagulant use was substantially higher in the empagliflozin group (74.3% vs 45.7%; $\chi^2=4.821$, $p = 0.028$), possibly reflecting a greater burden of atrial fibrillation or a higher thromboembolic risk. Anti-anginal agents were also more frequently prescribed in the empagliflozin group (57.1% vs 28.6%, $p = 0.030$), pointing to a higher underlying ischaemic disease burden. over 85% of patients in both groups were receiving statin therapy. Antiplatelet agents, diuretics, anti-hypertensives, corticosteroids, non-SGLT2 anti-diabetics, and nebulizers were distributed equally. Data are summarised in Table 1.

Table 1
Concomitant Medication Distribution

Concomitant Medication	DAPA Yes	DAPA No	EMPA Yes	EMPA No	p-value
Anti-coagulants	16 (45.7%)	19 (54.3%)	26 (74.3%)	9 (25.7%)	0.028*
Anti-platelet	31 (88.6%)	4 (11.4%)	31 (88.6%)	4 (11.4%)	1.000
Statins	31 (88.6%)	4 (11.4%)	30 (85.7%)	5 (14.3%)	0.011*
Diuretics	31 (88.6%)	4 (11.4%)	29 (82.9%)	6 (17.1%)	0.733
Anti-anginal	10 (28.6%)	25 (71.4%)	20 (57.1%)	15 (42.9%)	0.030*
Anti-hypertensives	23 (65.7%)	12 (34.3%)	20 (57.1%)	15 (42.9%)	0.623
Corticosteroids	5 (14.3%)	30 (85.7%)	3 (8.6%)	32 (91.4%)	0.707
Anti-diabetes (non-SGLT2)	14 (40%)	21 (60%)	6 (17.1%)	29 (82.9%)	0.064

*p < 0.05. Chi-square test with continuity correction applied throughout.

Hemodynamic Parameters

Both drugs significantly lowered systolic blood pressure in their respective groups. In the dapagliflozin group, mean systolic BP fell from 123.83 to 112.86 mmHg (paired $t = 2.920$, $p = 0.006$); in the empagliflozin group, the drop was from 124.29 to 113.71 mmHg (paired $t = 4.493$, $p < 0.001$). When the magnitude of change was compared between groups, the difference was negligible (Δ DAPA 10.40 ± 22.51 vs Δ EMPA 10.57 ± 13.92 mmHg; $t = 0.038$, $p = 0.970$). It is not significant, however, that Levene's test revealed significantly greater variability in the systolic BP response in dapagliflozin patients ($W = 4.699$, $p = 0.034$), suggesting that some individuals in that group had considerably larger or smaller responses than others.

Diastolic blood pressure fell significantly only with empagliflozin (from 77.43 to 72.57 mmHg, $p = 0.045$), with the dapagliflozin group showing a similar but non-significant trend ($p = 0.056$). The between-group comparison was not remarkable ($p = 0.895$). Heart rate did not change meaningfully in either group throughout the admission period. These data are presented in Table 2.

Table 2
Hemodynamic parameters before and after treatment

Parameter	DAPA Before	DAPA After	EMPA Before	EMPA After	Inter-group p-value
Systolic BP (mm Hg)	123.83 ± 19.5	112.86 ± 17.9	124.29 ± 18.0	113.71 ± 15.9	0.970
Paired t-test (p)	0.006*		0.0001*		
Diastolic BP (mm Hg)	76.71 ± 11.8	72.29 ± 11.7	77.43 ± 12.0	72.57 ± 10.1	0.895
Paired t-test (p)	0.056		0.045*		
Heart rate (bpm)	84.40 ± 14.4	84.43 ± 9.8	88.89 ± 15.2	85.74 ± 16.9	0.467
Paired t-test (p)	0.991		0.364		

*p < 0.05. Paired t-test for within-group comparisons, independent t-test for between-group Δ comparisons.

Laboratory Parameters

Serum Creatinine rose modestly in both groups over the admission period: from 1.19 to 1.36 mg/dL in the dapagliflozin group (p = 0.024) and from 1.24 to 1.50 mg/dL with empagliflozin (p = 0.001). This early rise reflects the expected hemodynamic effect of SGLT2 inhibition on intraglomerular pressure and is well recognized in the literature. The magnitude of the rise was not significantly different between groups (Δ DAPA 0.17 ± 0.42 vs Δ EMPA 0.26 ± 0.42 ; p = 0.399; Mann-Whitney p = 0.424). Blood urea also increased in both groups, consistent with the same mechanism (DAPA p = 0.044; EMPA p = 0.038), again without any between-group difference. Serum uric acid rose significantly in the empagliflozin group alone (p = 0.007).

Random blood sugar fell substantially in the dapagliflozin group (from 161.23 to 131.17 mg/dL; p = 0.006), while the empagliflozin group showed a more modest, non-significant within-group change (p = 0.434). On first glance, this might suggest that dapagliflozin is the better glucose-lowering agent. Still, Mann-Whitney testing of the actual change scores told a more nuanced story: the glucose reduction in the dapagliflozin group was driven primarily by its much higher proportion of diabetic patients rather than by greater intrinsic efficacy (U = 373.5, p = 0.005). When only diabetic patients were analyzed, empagliflozin achieved a meaningfully larger absolute reduction in blood glucose (Δ RBS: -75.00 vs -42.33 mg/dL in the dapagliflozin diabetic subgroup, p < 0.001), consistent with its higher reported SGLT2 receptor affinity.

The most clinically interesting electrolyte finding was in serum sodium. In the dapagliflozin group, sodium dropped from 140.37 to 137.89 mEq/L (p < 0.001), and the between-group comparison of change scores was statistically significant (Δ DAPA 2.51 ± 2.66 vs Δ EMPA 0.83 ± 2.42 mEq/L; t = 2.773, p

= 0.007). Potassium declined in both groups, though more steeply with empagliflozin (from 4.18 to 3.73 mEq/L; $p < 0.001$ vs dapagliflozin: 4.21 to 3.99; $p = 0.018$), with the between-group comparison trending toward significance ($p = 0.086$). Hemoglobin, white cell count, and platelet count showed no meaningful change in either group (Table 3).

Table 3
Laboratory Parameters Before and After Treatment

Parameter	DAPA Pre	DAPA Post	EMPA Pre	EMPA Post	Δp	MWU P
Hemoglobin (g/dL)	13.02 $\pm$ 2.3	12.66 $\pm$ 1.9	12.73 $\pm$ 2.5	12.68 $\pm$ 2.2	0.293	0.290
TWBC (cells/ μ L)	8607 $\pm$ 3346	9045 $\pm$ 3924	8525 $\pm$ 2832	10423 $\pm$ 9837	0.420	0.879
Platelet Count ($\times 10^3$)	255.8 $\pm$ 106.9	260.5 $\pm$ 88.7	210.9 $\pm$ 58.6	212.9 $\pm$ 52.1	0.848	0.716
Blood Urea (mg/dL)	31.97 $\pm$ 16.6	39.20 $\pm$ 22.6	30.91 $\pm$ 15.5	37.63 $\pm$ 21.1	0.912	0.585
Sr.Creatinine (mg/dL)	1.19 $\pm$ 0.35	1.36 $\pm$ 0.53	1.24 $\pm$ 0.43	1.50 $\pm$ 0.56	0.399	0.424
Uric Acid (mg/dL)	5.95 $\pm$ 1.86	6.41 $\pm$ 2.07	5.45 $\pm$ 1.75	6.41 $\pm$ 2.33	0.257	0.318
RBS (mg/dL)	161.23 $\pm$ 58.6	131.17 $\pm$ 43.6	145.23 $\pm$ 66.9	136.26 $\pm$ 12.1	0.174	0.005*
Sodium (mEq/L)	140.37 $\pm$ 3.3	137.89 $\pm$ 3.8	135.69 $\pm$ 2.97	134.86 $\pm$ 2.9	0.007*	0.010
Potassium (mEq/L)	4.21 $\pm$ 0.49	3.99 $\pm$ 0.52	4.18 $\pm$ 0.46	3.73 $\pm$ 0.52	0.086	0.070

* $p < 0.05$. Δp : independent t-test on change scores; MWU p: Mann-Whitney U test.

Ejection Fraction (EF)

Ejection Fraction improved significantly in both groups during the admission period. In the dapagliflozin group, mean EF rose from 35% to 39% (mean $\Delta 4\% \pm 4\%$; paired $t = -5.36$, $p < 0.001$); in the empagliflozin group, it increased from 35% to 40% (mean $\Delta 5\% \pm 5\%$; paired $t = -6.528$, $p < 0.001$). The inter-group difference in EF change did not reach significance ($t = -1.655$, $p = 0.102$; Mann-Whitney, $p = 0.104$), though the numerical direction consistently favored empagliflozin. A one-way ANOVA examining EF improvement across age groups yielded an F-statistic of 3.101 ($p = 0.052$), with patients under 40 years showing a mean ΔEF of 7%, compared to 3.1% in those over 60, suggesting a possible age-related gradient in cardiac recovery that warrants exploration in larger studies.

KCCQ-12 Quality of Life

Both groups reported moderate impairment across all KCCQ-12 domains, which is consistent with symptomatic heart failure. The empagliflozin group scored numerically higher on every domain, though most of these differences did not reach conventional statistical significance by independent t-test.

The Physical Limitation Score was 55.18 ± 20.54 with dapagliflozin versus 60.36 ± 19.41 with empagliflozin ($p = 0.282$). The Symptom Frequency Score was 51.90 ± 18.25 versus 58.04 ± 16.44 ; the parametric t-test was non-significant at $p = 0.144$, but the non-parametric Mann-Whitney U test found a significant distributional difference ($p = 0.033$). This means the distribution of symptom frequency responses was shifted meaningfully towards higher scores in empagliflozin patients, a finding with clinical relevance even without a large mean difference. Quality of Life scores were identical across groups (63.21 in both, $p = 1.000$). The Social Limitation Score (53.93 vs 59.29, $p = 0.290$) and the Overall KCCQ Score (56.06 vs 60.22, $p = 0.278$) both favored empagliflozin numerically, but did not reach significance. Table 4 contains the full KCCQ data.

Table 4
KCCQ-12 Domain and Overall Scores by Treatment Group

KCCQ Domain	Dapagliflozin Mean ± SD	Empagliflozin Mean ± SD	t-test p	Mann-Whitney p
Physical Limitation Score	55.1820.54	60.3619.41	0.282	0.275
Symptom Frequency Score	51.9018.25	58.0416.44	0.144	0.033*
Quality of Life Score	63.2117.92	63.2115.14	1.000	0.730
Social Limitation Score	53.9319.59	59.2922.35	0.290	0.381
KCCQ Overall Score	56.0615.93	60.2215.97	0.278	0.252

* $p < 0.05$. Shapiro-Wilk normality testing was applied to all domains before analysis.

Correlation Analyses

HbA1c and pre-treatment RBS correlated almost perfectly in both groups (DAPA $r = 1.000$; EMPA $r = 0.999$, both $p < 0.001$). This near-perfect relationship validates the glycemic data and confirms the internal consistency of our measurements. Serum creatinine and blood urea were strongly correlated at baseline (DAPA $r = 0.701$; EMPA $r = 0.582$, both $p < 0.001$), behaving exactly as parallel renal biomarkers should.

Age showed a consistent, albeit non-significant, negative association with EF improvement in both groups (DAPA $r = 0.328$, $p = 0.054$; EMPA $r = 0.221$, $p = 0.202$). The trend suggests younger patients may recover more cardiac function with SGLT2 inhibitors, though our sample size was insufficient to establish this definitively. Glycemic control, as measured by HbA1c, did not predict the magnitude of EF improvement in either group, nor did glucose change predict EF change. In the empagliflozin group, there

was a borderline positive association between post-treatment EF and RBS ($r = 0.318$, $p = 0.063$), suggesting a metabolic-cardiac interaction worthy of further study, and all correlation data in Tables 5 and 6.

Table 5
Pearson Correlation Coefficients for Clinical Parameter Pairs

Variable Pair	DAPA r	DAPA p	EMPA r	EMPA p	Interpretation
HbA1c vs RBS (pre-treatment)	1.000	< 0.001*	0.999	< 0.001*	Strong positive
Creatinine vs BUN (pre-treatment)	0.701	< 0.001*	0.582	< 0.001*	Moderate positive
Age vs EF	-0.328	0.054	-0.221	0.202	Weak negative
Age vs Δ Systolic BP	-0.236	0.172	-0.116	0.508	Weak negative
HbA1c vs Δ EF	-0.112	0.522	0.028	0.875	Not significant
Δ EF vs Δ EF	0.195	0.262	0.004	0.980	Not significant
EF-After vs RBS after	0.035	0.840	0.318	0.063	Trend in EMPA
r=Pearson correlation coefficient					

Table 6
KCCQ-12 Inter-Domain Pearson Correlation Analysis

Domain Pair	DAPA r	DAPA p	EMPA r	EMPA p
Physical Limitation vs Symptom Frequency	0.670	< 0.001*	0.866	< 0.001*
Physical Limitation vs QoL	0.522	0.001*	0.662	< 0.001*
Physical Limitation vs Social Limitation	0.468	0.005*	0.619	< 0.001*
Symptom Frequency vs QoL	0.710	< 0.001*	0.733	< 0.001*
Symptom Frequency vs Social Limitation	0.613	< 0.001*	0.654	< 0.001*
QoL vs Social Limitation	0.620	< 0.001*	0.564	< 0.001*
Overall Score vs Physical Limitation	0.805	< 0.001*	0.900	< 0.001*
Overall score vs Symptom Frequency	0.890	< 0.001*	0.923	< 0.001*
Overall Score vs QoL	0.844	< 0.001*	0.824	< 0.001*
Overall Score vs Social Limitation	0.808	< 0.001*	0.840	< 0.001*

* $p < 0.05$. Strong and consistent inter-domain correlations in both groups confirm the construct validity of the KCCQ-12 in this population.

DISCUSSION

This study compared dapagliflozin and empagliflozin at a single institution using consistent methods across clinical, biochemical, echocardiographic, and patient-reported measures. Both drugs had generally similar effects: ejection fraction improved, blood pressure decreased, and creatinine rose slightly. However, there were clear differences in electrolyte balance, blood sugar response, and patient-reported symptoms¹¹.

The improvement in ejection fraction with both drugs during a short hospital stay suggests that SGLT2 inhibitors benefit the heart quickly through mechanisms beyond glucose lowering. They reduce preload by promoting natriuresis and osmotic diuresis¹². They also directly affect the heart muscle by reducing sodium and calcium overload, thereby improving contractility¹³. Additionally, they reduce sympathetic activity and partly decrease inflammation and fibrosis¹⁴. Although empagliflozin showed a slightly larger increase in ejection fraction (0.05 versus 0.04), this difference was not statistically significant here but aligns with the EMPEROR-Reduced findings and warrants further study¹⁵.

The sodium results are especially noteworthy. Dapagliflozin caused a much larger drop in serum sodium (2.51 versus 0.83 mEq/L, $p = 0.007$), which hasn't been widely reported before. It's unclear whether this is due to differences in natriuretic strength, initial sodium levels, or other factors¹⁶. This matters clinically because many heart failure patients have dilutional hyponatremia, a condition linked to worse outcomes¹⁶. Dapagliflozin's effect on sodium levels may be important, depending on a patient's baseline levels. Meanwhile, potassium dropped further with empagliflozin, so patients on high-dose diuretics (over 80%) in both groups require careful monitoring.

The glucose results require careful explanation. Initially, dapagliflozin appeared to lower glucose levels overall, but this was because more diabetic patients were in that group¹⁷. When looking only at diabetic patients, empagliflozin reduced blood sugar nearly twice as much (-75.00 versus -42.33 mg/dl). This aligns with evidence that empagliflozin binds SGLT2 receptors more strongly¹⁸. This difference would be missed if we only considered combined data, highlighting why the composition of study groups matters in observational research.

The KCCQ-12 results are among the most clinically relevant, capturing patient-reported outcomes beyond lab values and imaging. The empagliflozin group scored higher across all areas. However, most differences were modest and not statistically significant by parametric tests; the symptom frequency domain showed significant improvement using Mann-Whitney testing ($p = 0.033$). This non-parametric result reflects a meaningful shift in symptom scores, with empagliflozin patients reporting fewer episodes of breathlessness, leg swelling, chest pain, and fatigue over the past two weeks⁹. This finding is clinically important regardless of differences in lab values¹⁹.

The KCCQ-12 domains showed strong correlations (0.47 to 0.92, all $p < 0.001$), confirming the tool's reliability for this group. The strongest connection in both groups was between Symptom Frequency and the Overall Score (DAPA $r = 0.890$; EMPA $r = 0.923$), showing that how often symptoms occur largely

shapes patients' overall health ratings. Because symptom frequency drives the overall KCCQ score, empagliflozin's better results here carry important clinical significance.

This study has several strengths: equal group sizes, a prospective design, standardized measurement methods, a validated quality-of-life tool, and a thorough statistical approach that didn't rely on just one test for any result. However, there are limitations²⁰. Since it's observational, we can't say the drugs alone caused the differences. Other factors, like more diabetics and higher use of anticoagulants and anti-anginals in the empagliflozin group, might have influenced the results. Follow-up only lasted until hospital discharge, so long-term effects are unknown. Also, being a single-center study may introduce bias. Future research should use random assignment, longer follow-up, and analyze heart failure types separately.²¹.

CONCLUSION

In 70 patients with heart failure treated over a single hospital admission, both dapagliflozin and empagliflozin significantly reduced systolic blood pressure and improved ejection fraction. Across most laboratory, hemodynamic, and echocardiographic outcomes, the two drugs were equivalent. Where they diverged: dapagliflozin produced a notably larger reduction in serum sodium, while empagliflozin achieved greater blood glucose lowering in diabetic patients, caused a steeper decline in potassium, and was associated with significantly better symptom frequency scores on the KCCQ-12.

Taken together, these results support the practical view that dapagliflozin and empagliflozin are therapeutically interchangeable for most heart failure patients, while also identifying specific clinical situations where one agent may offer an edge over the other. Empagliflozin appears better suited for patients in whom rapid symptom relief is the priority, particularly in the context of diabetes. Dapagliflozin may be preferable in patients with low serum sodium or those in whom additional natriuresis is desirable. These remain hypothesis-generating conclusions that need confirmation in adequately powered randomized trials.

Declarations

Conflict of Interest

The authors have no conflicts of interest to declare

Ethical Approval

The study was conducted in a tertiary care center, and approval was obtained from the institutional ethics committee (IEC/SRMC/SRCP/RESEARCH/159/2025). The study was conducted to ensure that informed consent was obtained from all participants and that anonymity was maintained throughout the analysis.

Data Availability

Data supporting these findings are available on reasonable request from the corresponding author.

Artificial Intelligence

The authors used Grammarly for proofreading and refining the writing and declare that no generative text or results are included.

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