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REVIEW

Management of Heart Failure in a Resource-Limited Setting: Expert Opinion from India

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ABSTRACT

Heart failure poses a global health challenge affecting millions of individuals, and access to guideline-directed medical therapy is often limited. This limitation is frequently attributed to factors such as drug availability, slow adoption, clinical inertia, and delayed diagnosis. Despite international recommendations promoting the use of guideline-directed medical therapy for heart failure management, personalized approaches are essential in settings with resource constraints. In India, crucial treatments like angiotensin II receptor blocker neprilysin inhibitors and sodium-glucose co-transporter 2 inhibitors are not fully utilized despite their established safety and efficacy. To address this issue, an expert consensus involving 150 specialists, including cardiologists, nephrologists, and endocrinologists, was convened. They deliberated on patient profiles, monitoring, and adverse side effects and provided tailored recommendations for guideline-directed medical therapy in heart failure management. Stressing the significance of early initiation of guideline-directed medical therapy in patients with heart failure, especially with sodium-glucose co-transporter 2 inhibitors, the consensus also explored innovative therapies like vericiguat. To improve heart failure outcomes in resource-limited settings, the experts proposed several measures, including enhanced patient education, cardiac rehabilitation, improved drug access, and reforms in healthcare policies.

Keywords: Heart failure; Guideline-directed medical therapy; Sodium-glucose co-transporter 2 inhibitors

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Key Summary Points

Diagnosis of heart failure relies on clinical suspicion and physical examination, aided by various diagnostic tests such as electrocardiogram, chest X-ray, N-terminal pro-brain natriuretic peptide, and 2D echocardiography.

The management of heart failure should be personalized, considering individual patient characteristics, comorbidities, and preferences.

It is crucial to address clinical inertia, especially among heart failure specialists, by increasing physician awareness and developing strategies to overcome it.

Patient education and counseling are vital in improving compliance with heart failure therapy, aiming to increase patients' knowledge about their treatment.

Point-of-care testing significantly reduces turnaround time, crucial for managing heart failure, particularly in remote areas with travel cost concerns.

Guideline-directed medical therapy for heart failure and diabetes includes medications such as angiotensin II receptor blocker neprilysin inhibitors (ARNi)/ angiotensin receptor blockers (ARB)/ angiotensin-converting enzyme inhibitors (ACEI), mineralocorticoid receptor antagonists (MRAs), beta-blockers, and sodium-glucose co-transporter 2 inhibitors (SGLT2i), with specific recommendations based on patient profiles and cardiovascular risk factors.

INTRODUCTION

Heart failure (HF) is a significant global health issue affecting 23 million individuals worldwide [1], with a reported prevalence of 1.2 per 1000 people in India, according to the INDia Ukieri Study (INDUS) study [2]. The Trivandrum Heart Failure Registry (THFR) found a 3-year all-cause mortality rate, with the highest risk observed in the initial 3 months post-discharge, and patients with heart failure with reduced ejection fraction (HFrEF) consistently faced a higher mortality risk than patients with heart failure with preserved ejection fraction (HFpEF) [3]. The annual incidence of heart failure (HF) in patients with coronary heart disease (CHD) suggests that 120,000 to 690,000 Indians could develop symptomatic HF each year. This results in a cumulative total of 600,000 to 3.5 million HF patients over 5 years [4]. With an estimated 50% mortality rate at 5 years, this leads to a prevalence of 300,000–1.75 million cases attributable solely to CHD [5].

HF is categorized based on left ventricular ejection fraction (LVEF), with HFrEF having an LVEF ≤ 40%, HFpEF having an LVEF ≥ 50%, and HF with midrange ejection fraction (HFmrEF) falling between 41 and 49% [6]. A South Indian registry showed that 65.9% had HFrEF, 20% had HFmrEF, and 14.03% had HFpEF. Acute de novo HF was present in 67% of patients, with 32.9% experiencing acute decompensated HF. Comorbidities varied, with coronary artery disease prevalent in 52.5%, type 2 diabetes in 62.8% and 56.6% for HFrEF and HFmrEF, respectively, and hypertension in 48% for HFpEF. Chronic kidney disease was reported in 13% of patients with heart failure [7].

The 2021 European Society of Cardiology (ESC) guidelines recommend initiating four drug classes: angiotensin receptor-neprilysin inhibitors (ARNi), beta-blockers (BB), mineralocorticoid receptor antagonists (MRAs), and sodium-glucose cotransporter-2 inhibitors (SGLT2i) [8]. The 2023 update extends the use of SGLT2i to patients with HFpEF and HFmrEF, becoming the sole universal recommendation for all patients with HF. For those with HFrEF or HFmrEF and iron deficiency, intravenous ferric carboxymaltose or ferric derisomaltose is recommended [9]. The expert consensus offers practical guidance for implementing GDMT in HF management, covering patient profiles, monitoring, and side effect identification according to guideline recommendations.

NEED FOR CONSENSUS

The guideline-directed medical therapy (GDMT) for HF includes ARNi/ angiotensin receptor blockers (ARB)/angiotensin-converting enzyme inhibitors (ACEI), MRAs, beta-blockers, and SGLT2i but these drugs are underutilized due to low availability, adoption, clinical inertia, and delayed diagnosis [10]. Despite national and international guidelines advocating for GDMT in patients with HF, it is crucial to tailor HF management, especially with limited resources. Resource-limited settings refer to health systems not meeting accepted norms and can be found in both rural and urban areas. In resource-limited settings, adhering to standard care may not always be feasible. Thus, our objective is to create a consensus statement to optimize resource utilization for managing heart failure in such settings [11]. Having clear and comprehensive guidelines is essential for physicians and cardiologists to accurately diagnose and classify HF and choose the most appropriate treatment regimen for the patient. In India, ARNi and SGLT2i are not prescribed and utilized adequately despite their proven safety and efficacy in HF [12].

METHODS

The Indian consensus group comprised 150 experts, predominantly cardiologists, nephrologists, and endocrinologists based in India. They actively participated in ten advisory board meetings conducted in October and November 2022, focusing on the diagnosis and management of heart failure in regions with limited clinical resources, particularly India. These sessions addressed objectives and topics related to GDMT for the management of HFrEF, HFmrEF, and HFpEF. Experts shared their viewpoints, initiating group discussions. Moderated by prominent cardiologists in the country, the advisory board meetings involved discussions with panel members from diverse regions. All 150 healthcare professionals were informed that a consensus paper would be developed based on the meeting discussions. The final consensus statement was formulated after more than 85% of the experts agreed. It is important to note that this article is grounded in previously conducted studies and does not present any new studies involving human participants or animals performed by the authors.

CLINICAL EVIDENCE AND CONSENSUS

Diagnosis of HF in a Resource-Limited Setting: Practical Approach

Consensus 1 Diagnosis of heart failure relies on clinical suspicion and physical examination, aided by electrocardiography (ECG), chest X-ray, N-terminal pro-brain natriuretic peptide (NT-proBNP), and 2D echocardiography.

Panel discussion A detailed physical examination and strong clinical suspicion are core for diagnosing HF in a resource-limited setting. Abnormal ECG and chest X-ray showing cardiomegaly and congestion are indicators of HF. NT-proBNP and 2D echocardiography (2D echo) imaging are essential tests for diagnosing and phenotyping HF. Diagnosing HFpEF is more challenging compared to HFrEF. Assessment of diastolic function in 2D echo shall be done to diagnose HFpEF. The H_2FPEF scoring system could be helpful in such clinical situations. The chances of HFpEF are high in elderly patients with atrial fibrillation (AF), hypertension, and obesity. The use of modified stress diastology, such as the 6-min walk test, E/e' ratio, and mitral velocities, are a few additional tests that aid in diagnosing HFpEF. Thus, for diagnosis, the clinical acumen of a primary physician is essential. For diagnosing HFpEF, the cardiologist's expertise in diastology is crucial for correct diagnosis. Also, available resources for diagnosis are to be considered. In resource-limited settings where access to advanced investigations and expensive treatments for heart failure (HF) may be restricted, clinicians must prioritize their diagnostic approach. While both brain natriuretic peptide and echocardiography play crucial roles in HF diagnosis and prognosis, their availability and affordability might be limited. In such contexts, clinicians should focus on utilizing basic

diagnostic tools that offer valuable insights. For instance, ECG emerges as a pivotal tool, offering both screening and prognostic information. Although ECG findings are highly sensitive indicators for HFrEF, they lack specificity, and a normal ECG virtually excludes HFrEF. However, the sensitivity of ECG in HFpEF is lower, with normal findings present in a significant portion of patients. Therefore, in resource-limited settings, clinicians can prioritize utilizing ECG alongside basic diagnostic methods to effectively screen and manage patients with HF, leveraging available resources for optimal patient care (Fig. 1).

Evidence In clinical practice, HF diagnosis commonly relies on symptoms and clinical signs, followed by ECG and NT-proBNP measurements. In case of abnormal tests, a referral for echocardiography should be made to confirm the diagnosis and differentiate between the three main HF types, HFpEF, HFmrEF, and HFrEF, and detect correctable anomalies. These cases are almost invariably of a slow start; acute onset HF is usually diagnosed in the hospital and is occasionally preceded by a period of complaints that are not recognized as HF symptoms [13]. Biomarkers such as soluble ST2 (sST2), galectin-3 (Gal-3), and growth-differentiation factor-15 (GDF-15) are currently emerging as promising indicators of heart failure. Clinical guidelines offer a Class IIb recommendation to contemplate the measurement of sST2 and Gal-3 as supplementary risk factors in heart failure [14]. Telemedicine consultations in HF care provide convenience and time savings, especially for clinically stable patients, making them suitable for outpatient management. In-person

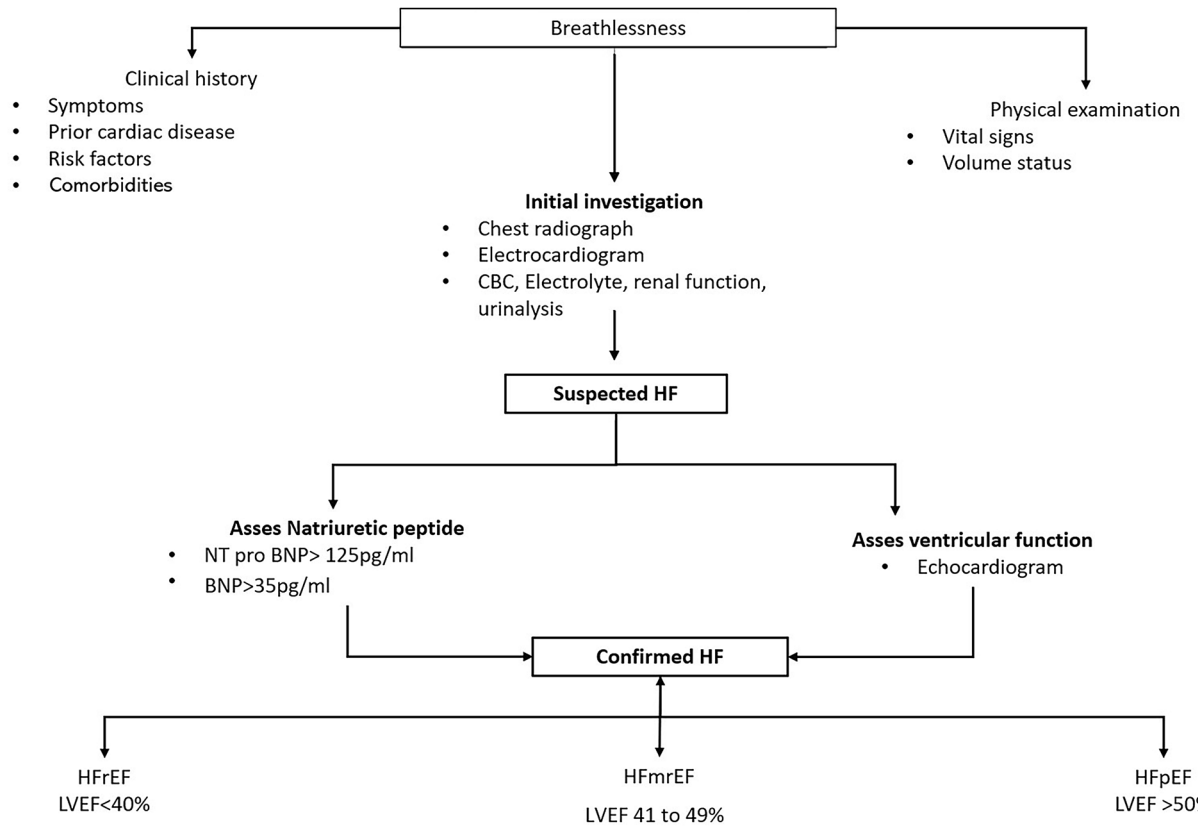

Fig. 1 Diagnostic approach for heart failure. *HFpEF* heart failure with preserved ejection fraction, *LVEF* left ventricular ejection fraction, *HFrEF* heart failure with reserved ejection fraction, *HF* heart failure, *CBC* complete blood count, *NT pro-BNP* N-terminal pro hormone of brain natriuretic peptide, *HFmrEF* heart failure with mid-range ejection fraction, *BNP* brain natriuretic peptide

assessments are necessary for symptom deterioration, and telemedicine is particularly advantageous in reducing costs, travel expenses, and the need for regular hospital visits, especially in rural areas [15].

In resource-limited India, point-of-care (POC) diagnostic devices offer significant advantages, enhancing healthcare accessibility for a large population. POC enhances diagnostic capacity for severe diseases at a lower cost, making them affordable for many and also offers convenience for continuous monitoring and follow-up tests, reducing turnaround time significantly [16]. This rapid diagnosis is crucial for managing heart failure, especially in remote areas where travel costs are a concern. Recent studies demonstrate the effectiveness of POC testing, such as NT-proBNP testing with the FLEX analyser, in diagnosing and prognosticating congestive heart failure, showcasing the potential of POC devices to improve healthcare outcomes in resource-limited settings [17].

Criteria for Referral to a Cardiology Consultation

Consensus 2 Referral decisions should not delay the initiation or optimization of prognostic-modifying therapy.

Panel discussion In certain medical conditions, particularly in patients with anemia and infections, general practitioners (GPs) play a crucial role in both diagnosing and managing anemia in individuals suffering from HF. Identifying and addressing anemia becomes a critical aspect of comprehensive patient care. In resource-limited settings, where access to specialized healthcare may be constrained, the initial stages of anemia treatment can be undertaken by skilled nursing professionals. This collaborative approach ensures that timely interventions are implemented, even in environments with limited resources, contributing to better outcomes for patients managing both heart failure and anemia (Table 1).

Evidence The criteria for referral depend on the type of heart failure—HFrEF, HFmrEF, HFpEF, or de novo HF. HF with improved ejection fraction (HFimpEF) is a new classification that is distinctly defined as symptomatic HF with a baseline LVEF ≤ 40%, a ≥ 10-point increase from baseline LVEF, and a second measurement of LVEF > 40% [15]. The choice to refer a patient for a hospital consultation should not impede the prompt commencement or enhancement of prognostic-modifying therapy. Such therapy is valuable for the cardiovascular protection of the patient while awaiting a hospital consultation. An increased rate of referrals to specialty care follow-up may indicate the challenges primary care physicians face in coordinating the growing complexity of modern heart failure (HF) care, such as new pharmacotherapies, catheter-based procedures, and device or surgical therapies [19, 20].

Current Guidelines Recommendations for HF

Consensus 3 Management of heart failure should be individualized based on each patient's clinical characteristics, preferences, and comorbidities.

Evidence The use of pharmacological therapy is a cornerstone of HF management. Guidelines are constantly evolving as new evidence emerges. Thus, Tables 2 and 3 represent different guideline recommendations for managing heart failure.

Clinical Strategies to Optimize the Management of HF

Clinical Inertia

Consensus 4 Increasing physician awareness to address the clinical inertia is crucial in tackling the problem, particularly among HF specialists who can develop strategies to alleviate it.

Panel discussion Clinical inertia in heart failure treatment is influenced by various factors, such as lack of familiarity with guidelines, diagnostic difficulties, comorbidities, patient-related issues, system-related challenges, physician-related factors, and communication problems. To address clinical inertia, it is crucial to implement measures such as educating healthcare providers, improving guideline accessibility, promoting patient engagement, and optimizing healthcare systems. These steps involve standardizing

Table 1 Criteria for referral to a cardiology consultation

Type of heart failure	Patient criteria
Heart failure with preserved LVEF (≥ 50%)	Patients with preserved LVEF who have had > 2 hospitalizations/visits to the emergency department in 1 year, after excluding non-compliance with medication and lifestyle measures
	Patients with suspected restrictive/infiltrative disease (e.g., cardiac amyloidosis)
	Patients with suspected hypertrophic cardiomyopathy
	Patients with moderate/severe pulmonary HTN [18]
Heart failure with reduced or mildly reduced LVEF (≤ 49%)	Criteria for returning in patients with LVEF > 35%, without devices, under maximum optimized therapy, without hospitalizations/decompensation episodes > 1 year, with a concluded etiological evaluation
Irrespective of etiology	The cause of HF is not identified
	Worsening of HF symptoms
	Onset of complications
	Recent hospital admission for HF
	Patients with advanced HF
	Lack of diagnostic infrastructure—2D echo
	Unable to test for biomarkers (NT-proBNP)
	Low optimization of HF evidence-based treatments and doses
	Late identification of patients requiring HF device referral for advanced intervention
	Precipitating factors-atrial fibrillation, anemia, and infections

LVEF left ventricular ejection fraction, *HTN* hypertension, *HF* heart failure, *NT-proBNP* N-terminal pro-brain natriuretic peptide

care, educating providers, utilizing technology, involving patients in decision-making, and establishing accountability through quality metrics.

Evidence Clinical inertia is a prevalent phenomenon in chronic illnesses, particularly when patients present few symptoms, leading to a higher incidence of delayed and underdiagnosed cases. This inertia is primarily ascribed to physicians, with numerous surveys indicating that patients often do not receive optimal treatment despite doctors claiming adherence to guidelines. Soft excuses such as patient nonadherence, time constraints during appointments, and hesitancy to modify therapy can also contribute to clinical inertia. Moreover, the lack of education, training, and organization are significant factors that contribute to this inertia. All physicians need to recognize the relevance and seriousness of clinical inertia and actively work to address it. Raising awareness through conferences, continuing medical education (CME), and keeping abreast of the latest guidelines for heart failure (HF) management among specialists treating HF should facilitate the development of strategies that can mitigate or eliminate clinical inertia [21].

Patient Education and Compliance

Consensus 5 The approach to improve compliance involves educating and counseling patients to increase their knowledge about HF therapy.

Panel discussion The Trivandrum heart failure registry showed that GDMT is used in only 25% of the patients. Caveats for the use of anti-renin–angiotensin–aldosterone system (RAAS) agents, beta-blockers, and MRAs are another reason for not offering the GDMT to patients. In India, the primary goal includes implementing

Table 2 Guideline recommendations from ESC and ACC/AHA/HFSA for quadruple therapy across HF types [6, 9]

Drugs	Guideline	Recommendation	COR	LOE
ARNi	ESC 2023 [6]	HFrEF	I	A
		HFmrEF	II	B
	ACC/AHA/HFSA 2022 [9]	HFpEF	II	B
Beta-blocker	ESC 2023	HFrEF	I	A
	ACC/AHA/HFSA 2022 [6, 9]	HFmrEF	II	B
MRAs	ESC 2023 [6]	HFrEF	I	A
		HFmrEF	II	B
	ACC/AHA/HFSA 2022 [9]	HFpEF	II	B
SGLT2i	ESC 2023 [6]	HFrEF	I	A
		HFmrEF	I	A
		HFpEF	I	A
	ACC/AHA/HFSA 2022 [9]	HFmrEF	II	A

ESC European Society of Cardiology, *ACC/AHA/HFSA* American College of Cardiology/American Heart Association/Heart Failure Society of America, *ARNi* angiotensin II receptor blocker neprilysin inhibitor, *MRAs* mineralocorticoid receptor antagonists, *SGLT2i* sodium-glucose co-transporter 2 inhibitors, *HFrEF* heart failure with reduced ejection fraction, *HFmrEF* heart failure with midrange ejection fraction, *HFpEF* heart failure with preserved ejection fraction, *COR* class of recommendation, *LOE* level of evidence

guideline-directed medical therapy. Providing patient education, using the teach-back method, and involving family and caregivers are all measures to raise patient awareness of HF and enhance compliance with HF therapy. These measures involve a patient-centered approach emphasizing clear communication, engagement, and emotional support to improve patient understanding and compliance. Improving patient awareness and compliance with HF therapy can improve health outcomes and reduce hospitalizations.

Evidence Individuals experiencing heart failure need to have a comprehensive understanding of their condition and actively participate in decisions regarding its management. Encouraging self-care practices is crucial for improving patients' quality of life and preventing exacerbations. Rehabilitation programs that incorporate exercise, lifestyle adjustments, education, and psychological support can provide significant benefits to patients with heart failure. Non-compliance with medication and dietary recommendations can exacerbate symptoms and lead to hospitalization [22]. Unfortunately, patients with heart failure often struggle to adhere adequately and consistently to self-care recommendations. Positive predictors of adherence include being male, having no chronic comorbidities, and possessing a good understanding of heart failure. To enhance adherence, it is essential to improve heart failure patients' knowledge of the signs, symptoms, and management strategies associated with their condition. Additionally, there is a need to increase awareness, accessibility, and adoption of medications for heart failure management, especially in resource-limited settings [23].

Financial Burden and Access to Treatment

Consensus 6 Despite substantial support for the idea of the Health Impact Fund, there are concerns about scalability, generalizability, and the impact on access to medicines.

Table 3 Guideline recommendation of SGLT2i for management of heart failure

Guideline and recommendation	COR	LOE	References
American Heart Association/Heart Failure Society of America 2022			[6]
In patients with symptomatic chronic HFrEF, SGLT2i is recommended to reduce hospitalization for HF and cardiovascular mortality, irrespective of the presence of type 2 diabetes	I	A	
In patients with type 2 diabetes and either established CVD or at high cardiovascular risk, SGLT2i should be used to prevent hospitalizations for HF	I	A	
In patients with HFmrEF, SGLT2i can be beneficial in decreasing HF hospitalizations and cardiovascular mortality	IIa	B-R	
In patients with HFpEF, SGLT2i can be beneficial in decreasing HF hospitalizations and cardiovascular mortality	IIa	B-R	
European Society of Cardiology Guidelines for Heart Failure 2023			[9]
An SGLT2i (dapagliflozin or empagliflozin) is recommended in patients with HFmrEF and HFpEF to reduce the risk of HF hospitalization or CV death	I	A	
In patients with T2DM and CKD, SGLT2i is recommended to reduce the risk of HF hospitalization or CV death	I	A	
European Society of Cardiology Heart Failure Guidelines 2021			[8]
SGLT2i (canagliflozin, dapagliflozin, empagliflozin, ertugliflozin, sotagliflozin) are recommended in patients with diabetes at high risk of CV disease or with CV disease to prevent HF hospitalizations	I	A	
Dapagliflozin or empagliflozin are recommended for patients with HFrEF to reduce the risk of HF hospitalization and death	I	A	
SGLT2i (canagliflozin, dapagliflozin, empagliflozin, ertugliflozin, sotagliflozin) are recommended in patients with T2DM at risk of CV events to reduce hospitalizations for HF, major CV events, end-stage renal dysfunction, and CV death	I	A	
SGLT2i was recommended for patients with T2DM and ASCVD to reduce the risk of HF hospitalization and death. SGLT2i, such as dapagliflozin, are recommended in patients with mild to moderate HF attributable to reduced ejection fraction, and without concomitant T2DM, to reduce the risk of hospitalization and cardiovascular mortality	–	–	

HF heart failure, *CVD* cardiovascular disease, *CV* cardiovascular, *CKD* chronic kidney disease, *SGLT2i* sodium-glucose cotransporter 2 inhibitors, *HFrEF* heart failure with reduced ejection fraction, *HFmrEF* heart failure with midrange ejection fraction, *HFpEF* heart failure with preserved ejection fraction, *COR* class of recommendation, *LOE* level of evidence, *T2DM* type 2 diabetes mellitus, *ASCVD* atherosclerotic cardiovascular disease, *GLP-1 RA* glucagon-like peptide-1 receptor agonists

Panel discussion In India, between 50 and 65% of the population faces difficulty accessing medicines, and while affordability is a crucial factor, all stakeholders perceive access to medication as a severe concern. A more radical approach might be taken by the Health Impact Fund and other novel drug-related health policies, like operating outside the existing intellectual property

rights framework, focusing on both branded and generic pharmaceuticals, or expanding to research and development. However, In India, generic versions of ARNi and SGLT2i such as dapagliflozin are available, making them more accessible and affordable for patients with heart failure and diabetes. The increased availability of generic ARNi and SGLT2i provides clinicians with valuable options for optimizing treatment strategies and improving outcomes for patients in India and other resource-limited settings.

Evidence Heart failure is a significant cause of hospitalizations in India, accounting for 1.8 million admissions annually, and it affects between 2 and 3% of the global population. The in-hospital mortality rate for patients with heart failure in India is much higher, at 10–30.8% than the rate of 4–7% observed in Western countries. According to global data, India is the Southern Asian country that spends the most on heart failure, estimated at approximately $1186 million, representing 1.1% of the total global spending on heart failure [24]. According to a WHO estimate, India spent over $236 billion between 2005 and 2015, over 10 years, on the management of CVDs. It places a significant financial burden on regions with low per-capita health budgets [25]. Based on a 20% capacity-to-pay threshold, the Prospective Urban Rural Epidemiology study ($n = 16,874$ homes) showed that the combination of aspirin, beta-blockers, angiotensin-converting enzyme inhibitors, and statins would be unaffordable for 59% of Indian households [26].

Management of Heart Failure in Patients with/Without Diabetes Mellitus

Consensus 7 GDMT for patients of HF is the same irrespective of the presence or absence of diabetes mellitus.

Panel discussion HF therapy needs to be tailored to each patient's individual needs. Before initiating drugs such as SGLT2i, ARNi, BB, and MRAs, it is crucial to assess renal function through tests like serum creatinine, estimated glomerular filtration rate (e-GFR), and serum potassium to identify potential contraindications. The initiation of the four pillar drugs in the quadruple therapy should begin with small doses in the ICU once inotropes are discontinued, and the patient is stabilized (usually after 48 h). Gradual up-titration of the dose should occur over 4–6 weeks, reaching the target dose within 6 months as the patient tolerates it. Unnecessary drugs like nitrates and hydralazine should be discontinued.

In patients with acute kidney injury during hospitalization for acute HF treatment, MRAs can be started later. Iron therapy should be considered in HF management, especially as improvement is faster when correcting iron levels. According to the American College of Cardiology/American Heart Association/Heart Failure Society of America (ACC/AHA/HFSA), intravenous iron replacement may reasonably enhance functional status and quality of life in patients with New York Heart Association (NYHA) class II and III HF and iron deficiency. Intravenous ferric carboxymaltose (IV FCM) should be considered for treating iron deficiency in symptomatic patients with a left ventricular ejection fraction (LVEF) < 45% to alleviate symptoms, improve exercise capacity, and enhance quality of life (Fig. 2).

Evidence Recent guidelines from the ESC and an expert consensus update by the ACC in 2023 have highlighted the significant benefits of SGLT2i in the treatment of heart failure, regardless of the patient's diabetes status [8, 32]. In particular, the DAPA-HF and EMPEROR trials revealed a significant 30% reduction in heart failure rehospitalization when employing SGLT2i for patients with HFrEF [33]. Moreover, irrespective of diabetes, ARNi has been shown to lower cardiovascular mortality and hospital admissions in individuals with HFrEF. Additionally, ARNi has positively affected left ventricular reverse remodeling, as indicated by decreased N-terminal pro-brain natriuretic peptide (NT-proBNP) levels. MRAs were linked to a lower risk of hospitalization for all causes in older patients with heart failure and concurrent diabetes mellitus or renal insufficiency despite a higher risk of hospitalization for hyperkalemia or acute renal insufficiency. It is worth noting that while MRAs was considered safe for a carefully chosen group of patients with heart failure with concomitant

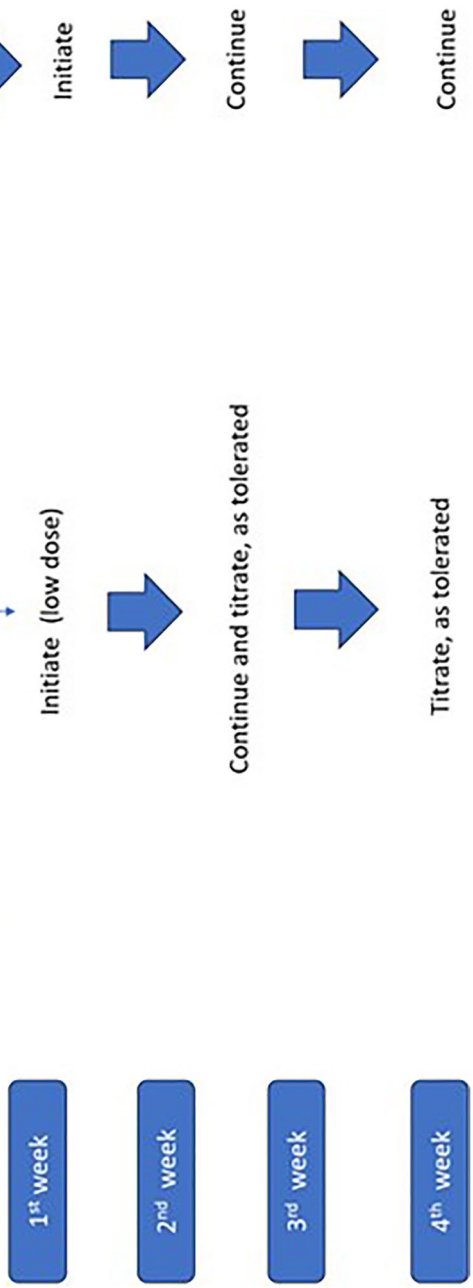

Fig. 2 GDMT dose titration in management of heart failure. *ARNI* angiotensin receptor neprilysin inhibitor, *ACEI* angiotensin-converting enzyme inhibitor, *MRAs* mineralocorticoid receptor antagonists, *DAPA* dapagliflozin, *EMPA* empagliflozin, *GDMT* guideline-directed medical therapy

Table 4 Landmark clinical trials for the management of HF

Study	*N*	Main inclusion criteria	Treatment groups	Primary outcome	Result
PARADIGM-HF, 2014	8422	HF (NYHA Class II, III or IV) and EF ≤ 40%	Sacubitril/valsartan (S/V) 200 mg BD Or Enalapril (E) 10 mg BD Follow-up = 27 months	Composite of death from CV causes or hospitalization for HF	Primary endpoint: S/V = 21.8%; *E* = 26.5% HR 0.80; CI, 0.73 to 0.87;$p < 0.001$) Death from CV causes: S/V = 13.3%; *E* = 16.5% HR 0.84; CI, 0.76 to 0.93 ; $p < 0.001$
VICTORIA, 2020	5050	Chronic HF (NYHA II, III, or IV) and LVEF < 45%	Vericiguat (target dose = 10 mg OD) Follow-up = 10.8 months	Composite of death from CV causes or first hospitalization for HF	Primary endpoint: Vericiguat = 35.5%; placebo = 38.5% HR 0.90; 95% CI, 0.82 to 0.98; $p = 0.02$ HF hospitalization: vericiguat = 27.4%; placebo = 29.6% HR 0.90; 95% CI, 0.81 to 1.00 Death from CV causes: vericiguat = 16.4%; placebo = 17.5% HR 0.93; 95% CI, 0.81 to 1.06 Death or HF hospitalization: vericiguat = 37.9%; placebo = 40.9% HR 0.90; CI, 0.83 to 0.98; $p = 0.02$

Table 4 continued

Study	*N*	Main inclusion criteria	Treatment groups	Primary outcome	Result
COMET, 2003	2309	LVEF < 35% and NYHA class II-IV	Metoprolol or carvedilol initial dose: 6.25 mg OD; target dose: 25 mg OD	All-cause mortality	All-cause mortality was lower in the carvedilol than in the metoprolol group (34 vs. 40%; HR: 0.83; 95% CI: 0.74–0.93; *P* = .0017)
DAPA-HF, 2019	4722	HF (NYHA Class II, III or IV) and EF ≤ 40%	Dapagliflozin (D) 10 mg OD or placebo follow-up = 18.2 months	Composite of worsening heart failure (hospitalization or an urgent visit resulting in intravenous therapy for HF) or CV death	Primary endpoint: *D* = 16.3%; placebo = 21.2% HR 0.74; 95% CI 0.65 to 0.85;*p* < 0.001 WHF event: *D* = 10.0%; placebo = 13.7% HR 0.70; 95% CI, 0.59 to 0.83. Death from CV causes: *D* = 9.6%; placebo = 11.5% HR 0.82; 95% CI, 0.69 to 0.98
EMPEROR-reduced, 2020	3730	HF (NYHA Class II, III or IV) and EF ≤ 40%	Empagliflozin (E) 10 mg OD or placebo follow-up = 16 months	Composite of CV death or hospitalization for worsening HF	Primary endpoint: *E* = 19.4% placebo = 24.7% HR 0.75; *p* < 0.001 lower number of HF hospitalization in empagliflozin group (HR 0.70; *p* < 0.001)
Emperor-preserved, 2021 [27]	5988	Symptomatic heart failure and preserved ejection fraction (EF > 40%)	Empagliflozin 10 mg per day or placebo	Primary composite outcome (cardiovascular death or heart failure hospitalization)	Primary endpoint: E: 13.8% *p* 17.1%, (HR 0.79; *p* < 0.001) Hospitalization HF: *E* = 8.6%; *p* = 11.8% CV death: *E* = 7.3%; *p* = 8.2%

Table 4 continued

Study	*N*	Main inclusion criteria	Treatment groups	Primary outcome	Result
DELIVER [28]	6263	Chronic heart failure and a left ventricular ejection fraction of 40% or less	Dapagliflozin 10 mg OD or placebo	Composite of worsening heart failure or CV death	Primary endpoint: *D* = 16.4% and *p* = 19.5% (HR 0.82;95% CI 0.73 to 0.92; *p* 0.001) WHF: *D* = 11.8%; *p* = 14.5% HR 0.79; 95% CI, 0.69 to 0.91
EMPHASIS-HF [29]	2737	NYHA class II with EF no more than 35%	Eplerenone (up to 50 mg daily) or placebo	Composite of death from cardiovascular causes or hospitalization for HF	Primary endpoint: *E* = 18.3%; *p* = 25.9% (HR 0.63; *p* < 0.001)
EPHESUS [30]	6632	Hospitalized patients with CHF after acute MI LVEF ≤ 40%	Eplerenone (25–50 mg/day) or placebo	All-cause mortality and the composite of cardiovascular mortality/cardiovascular hospitalization	Reduced by eplerenone (RR-0.87; 95% CI 0.79–0.95; *p* = 0.002)
PARAGON-HF [31]	4822	NYHA functional class II-IV, LVEF > 45%	Sacubitril/valsartan (97/103 mg twice daily) vs. valsartan (160 mg twice daily)	Composite of total hospitalizations for HF and death from CV	NYHA class improved—S/V: 15%; V: 12.6%; odds ratio, 1.45; 95% CI, 1.13 to 1.86 Death from CV-S/V: 8.5%; V: 8.9% (HR 0.95; CI, 0.79 to 1.16)

PARADIGM-HF prospective comparison of ARNi with ACEI to determine impact on global mortality and morbidity in heart failure, *NYHA* New York Heart Association, *CV* cardiovascular, *VICTORIA* vericiguat global study in subjects with heart failure with reduced ejection fraction, *LVEF* left ventricular ejection fraction, *HR* hazard ratio, *COMET* carvedilol or metoprolol European trial, *DAPA-HF* dapagliflozin and prevention of adverse outcomes in heart failure, *EMPEROR* empagliflozin outcome trial in patients with chronic heart failure, *DELIVER* dapagliflozin evaluation to improve the lives of patients with preserved ejection fraction heart failure, *EMPHASIS-HF* eplerenone in mild patients hospitalization and survival study in heart failure, *EPHESUS* eplerenone post-acute myocardial infarction heart failure efficacy and survival study, *DECLARE TIMI* dapagliflozin effect on cardiovascular events-thrombolysis in myocardial infarction, *WHF* worsening heart failure, *PARAGON* the prospective comparison of ARNi [angiotensin receptor–neprilysin inhibitor] with ARB [angiotensin-receptor blockers] global outcomes in HF with preserved ejection fraction, *S/V* sacubitril/valsartan, *V* valsartan, *HF* heart failure, *EF* ejection fraction, *BD* twice daily, *OD* once daily, *CI* confidence interval, *RR* risk ratio, *P* probability value, *CHF* congestive heart failure, *HR* hazard ratio

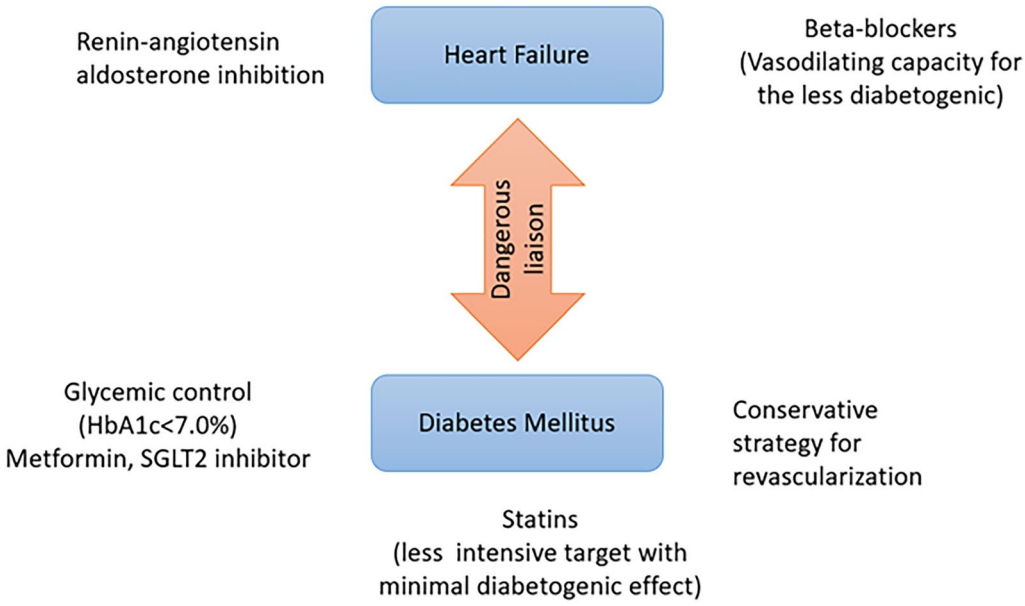

Fig. 3 Optimal treatment strategy of patients with heart failure combined with diabetes mellitus. *HbA1c* glycated hemoglobin, *SGLT2i* sodium/glucose co-transporter-2 inhibitors

diabetes mellitus or renal insufficiency, the enhanced risk of adverse events was primarily seen in patients with borderline or preserved ejection fraction (Table 4) [34].

Consensus 8 SGLT2i shall be recommended in all individuals with HF irrespective of diabetes status in individuals with high cardiovascular risk.

Panel discussion SGLT2i is recommended for heart failure irrespective of diabetes status, and ejection fraction plays a role in the prevention of HF in those with type 2 diabetes. Sotagliflozin may be a future SGLT2i in India, showing beneficial CV benefits. Every single patient of HF is a candidate for SGLT2i regardless of whether they have DM or not. SGLT2i reduces rehospitalization and mortality. In patients with HF, continuous use of SGLT2i improves renal function.

Evidence Diabetes is a significant comorbidity in patients with HF, and its presence dramatically increases the risk of cardiovascular morbidity and mortality. Therefore, treating both conditions with optimal therapy as early as possible is essential. The management of concomitant diabetes and HF is complex and still presents therapeutic challenges. To improve patient outcomes, it is crucial to use early and differentiated drug therapy, exhausting all possible treatment options. SGLT2i stands out as the initial class of blood glucose-lowering agents capable of decreasing the incidence of heart failure-related hospitalizations and cardiovascular mortality in diabetic and nondiabetic patients. Therefore, SGLT2i should be used as a first-line therapy for patients with diabetes and HF. Based on data from the DAPA-HF and EMPEROR-Reduced trials, it is anticipated that SGLT2i will be established as a permanent component in the guidelines for treating HF, both in patients with and without diabetes [35] (Fig. 3).

In the SOLOWIST-WHF trial, sotagliflozin yielded comparable results to the placebo in terms of the primary composite outcome (51.0 vs. 76.3%; HR 0.67; 95% CI 0.52–0.85; $p<0.001$) which involved patients with T2DM who had recently been hospitalized due to HF [36]. Likewise, in the VERTIS CV trial involving individuals with type 2 diabetes mellitus (T2DM) and atherosclerotic cardiovascular disease, ertugliflozin exhibited noninferiority to the placebo in terms of MACE [37]. These trials provided evidence of the positive effects of these drugs on heart failure. However, it is essential to note that these benefits did not extend to cardiovascular

outcomes, emphasizing that the positive impact on heart failure might not be generalized to all cardiovascular outcomes.

Drug Initiation and Titration in HF

Consensus 9 Consider initiating or continuing SGLT2i in patients with acute heart failure (once the patient is stabilized) regardless of diabetes status.

Panel discussion SGLT2i has been shown to reduce the risk of hyperkalemia and slow the progression of kidney dysfunction, which are favorable features for both short-term and long-term tolerance of ARNi and MRAs therapy, according to studies. Despite the significant clinical risk, medication discontinuation is standard in patients with HF hospitalized for HF, both during and after hospitalization. This increases the risk of subsequent clinical occurrences. To maximize medication tolerance and prevent withdrawal of other life-saving medications, in-hospital SGLT2i introduction should be prioritized as a part of a comprehensive strategy.

Evidence Initiating SGLT2i therapy in the hospital offers several compelling reasons, with one of the strongest being the prompt and significant clinical benefits that become evident within days to weeks of starting treatment, as reported in studies. For instance, empagliflozin exhibited a remarkable 58% relative decrease in mortality, HF hospitalization, or urgent HF visit 12 days after initiation [38]. The findings of SOLOIST-WHF reinforce these early benefits since initiating sotagliflozin in the hospital or early post-discharge led to early clinical event curve separation [36]. Failure to prescribe SGLT2i to eligible patients at discharge results in a clinically significant increased risk of death and readmission in the first few days to weeks after discharge [38].

Consensus 10 ARNi can be initiated in individuals with diabetes and HFrEF and is preferred to ACEI or ARB.

Panel discussion The management of HFrEF typically involves ARNi as foundational therapy. ARNi has been shown to increase LVEF even in patients previously taking ACEI or ARB, reduce the risk of hospitalization or death, and improve health status.

Evidence ARB is employed only for patients who cannot tolerate ACEI, making ACEI the cornerstone of treatment for patients with HFrEF for many years. The ACEI and ARB are no longer regarded as the gold standard renin-angiotensin inhibitors for the treatment of HFrEF due to the development of the ARNi sacubitril/valsartan. The landmark PARADIGM-HF trial demonstrated that compared to enalapril, treatment with sacubitril/valsartan was linked to a 20% decrease in cardiovascular death or HF hospitalization; this effect was also seen in individuals with diabetes. As a result, sacubitril/valsartan has been embedded as class I in clinical practice guidelines and is the preferred frontline treatment for HFrEF [39].

Consensus 11 Regular monitoring of serum potassium levels is needed using MRAs and other RAAS blockers in patients with HFrEF.

Panel discussion Large-scale prospective, double-blind trials have shown that the steroidal MRAs spironolactone and eplerenone lower cardiovascular mortality and HF hospitalizations among patients with HFrEF. These medications are crucial components of GDMT for HFrEF. The risk of hyperkalemia and acute renal insufficiency, however, may limit the ability to provide these beneficial medications to people with diabetes. Regular monitoring of potassium levels and the use of potassium-binding agents may facilitate the use of MRAs in these individuals.

Evidence Finerenone, a non-steroidal selective MRAs with more potent anti-inflammatory and antifibrotic effects than steroidal MRAs, has been proven in recent studies to offer more significant benefits in diabetic kidney disease (DKD). Treatment with finerenone was related to a decreased risk of DKD progression, cardiovascular events, myocardial infarction, and hospitalization for HF in the FIDELIO-DKD trial, which included 5734 people with CKD and T2DM [40]. Similarly, in the FIGARO-DKD trial, which involved 7400 individuals with T2D and DKD, finerenone significantly reduced cardiovascular death and nonfatal cardiovascular disease endpoints, including hospitalization for HF. However, finerenone is associated with a risk for hyperkalemia and requires careful serum potassium monitoring when used, like other MRAs [41].

Table 5 Summary of clinical trials highlighting renal outcomes with SGLT2i in HF

Study	*N*	Intervention	Results	References
DAPA-HF	4744	Dapagliflozin or placebo	ESKD events: 16 (0.7%) Reduction in eGFR > 40% or 50%:14 (0.6%) HR: 0.71 (0.44–1.16)	[42]
EMPEROR-REDUCED	3730	Empagliflozin or placebo	Composite renal outcome (chronic hemodialysis, renal transplantation, profound, sustained reduction in eGFR): 1.6 vs. 3.1 (HR 0.50, 95% CI 0.32–0.77, $p < 0.01$)	[43]
EMPEROR-PRESERVED	5988	Empagliflozin or placebo	Rate of decline in the eGFR was slower in the empagliflozin group than in the placebo group (−1.25 vs. −2.62 ml per minute per 1.73 m2 per year; $P < 0.001$)	[44]
CREDENCE	4401	Canagliflozin or placebo	ESKD: HR: 0.66 ($p < 0.001$) RR:32% reduction	[45]
SCORED	19,188	Sotagliflozin or placebo	Reduction in eGFR > 50%, chronic dialysis, renal transplant, sustained eGFR < 15: HR 0.5% ($p = 0.11$)	[46]
EMPA-KIDNEY	6609	Empagliflozin or placebo	progression of kidney disease or death from cardiovascular causes (13.1%) (HR 0.72; 95% CI 0.64–0.82; $p < 0.001$)	[47]
EMPAG-HF	60	Empagliflozin or placebo	Empagliflozin increased diuretic efficiency (95% CI 0.6–27.7]; $p = 0.041$) eGFR: 51 ± 19 versus 54 ± 17 ml/min per 1.73 m^2; $p = 0.599$)	[48]

SGLT2i sodium-glucose co-transporter 2 inhibitors, *ESKD* end-stage kidney disease, *HR* hazard ratio, *eGFR* estimated glomerular filtration rate, *RR* risk ratio, *p p* value, *HF* heart failure, *CI* confidence interval

Role of SGLT2i in Heart Failure: Pleiotropic Effects and Implications for Practice

Consensus 12 SGLT2i therapy improves renal outcomes in patients with HF.

Panel discussion SGLT2i has been demonstrated to reduce the composite renal endpoint in patients by decreasing proximal nephron salt reabsorption, resulting in lower intraglomerular hydrostatic pressures and TGF restoration. Patients with diabetes tend to have a more significant acute decline in the estimated glomerular filtration rate (eGFR) (Table 5).

Evidence Growing evidence from randomized, controlled trials supports the benefits of sodium-glucose co-transporter 2 inhibitors (SGLT2i) on cardiac and renal complications. The indications for SGLT2i have expanded to include glycemic control, reducing atherosclerotic cardiovascular disease (ASCVD), heart failure, diabetic kidney disease, and nondiabetic kidney disease. Although atherosclerosis, cardiac disease, and heart failure are all conditions worsened by kidney disease, there are currently no drugs that specifically protect renal function. However, recent randomized trials, namely DAPA-CKD and EMPA-Kidney, have demonstrated the clinical benefits of dapagliflozin and empagliflozin in improving outcomes for patients with chronic kidney

disease. SGLT2i consistently provides cardiorenal protection, reducing the progression of kidney disease and the risk of cardiovascular-related deaths in patients with and without diabetes mellitus [49, 50]. A meta-analysis has shown that SGLT2i alters the risk of kidney disease progression and acute kidney injury, not only in patients with type 2 diabetes at high cardiovascular risk but also in patients with chronic kidney disease or heart failure, regardless of diabetes status, primary kidney disease, or kidney function. Another meta-analysis found that irrespective of the estimated glomerular filtration rate (eGFR) levels, SGLT2i significantly lowers the risk of primary renal outcomes in individuals with chronic kidney disease. Consistent benefits have also been observed in patients with type 2 diabetes. However, renal advantages in individuals with ASCVD were mainly identified in those with chronic kidney disease with microalbuminuria, while no discernible benefits were seen in those whose eGFR was less than 60 ml/min/1.73.(57) m^2 [51]. A meta-analysis of 20 randomized controlled trials involving 63,604 patients with type 2 diabetes, heart failure, or chronic kidney disease found that SGLT2i (dapagliflozin, canagliflozin, empagliflozin, and ertugliflozin) were associated with a significant reduction in the risk of incident atrial fibrillation (AF) compared to the control group. However, there was no significant impact on the risk of stroke. The study suggests that SGLT2i may lower the risk of AF but does not have a substantial effect on the risk of stroke in patients with and without type 2 diabetes [52]. In another meta-analysis of 42 trials involving 61,076 patients with type 2 diabetes indicates that treatment with SGLT2i is associated with a reduced incidence of major adverse cardiovascular events, myocardial infarction, cardiovascular mortality, and all-cause mortality compared to control groups [53].

Consensus 13 SGLT2i is effective for the treatment of heart failure regardless of ejection fraction.

Panel discussion SGLT2i has robust clinical data for HFpEF compared to other GDMT (ARNi, MRAs, BB). SGLT2i have proven effective across the spectrum of HF (HFrEF, HFmrEF, HFpEF). The patient must receive an SGLT2i as soon as the patient becomes euvolemic and is off inotropes. The metabolic side effects need not be monitored for SGLT2i.

Evidence The meta-analysis of data from the DELIVER, EMPEROR-Preserved, and three other trials involving a total of 21,947 participants found that SGLT2i significantly reduced the risk of composite cardiovascular death or hospitalization for heart failure, cardiovascular death, hospitalization for heart failure, and all-cause mortality. These benefits were observed consistently in heart failure with mildly reduced or preserved ejection fraction across all five trials. The analysis also revealed that, for the primary endpoint, treatment effects on all categories, including ejection fraction, were relatively consistent. These findings support the use of SGLT2i for all types of HF, regardless of ejection fraction [54].

A recent meta-analysis of the DAPA-HF and EMPEROR-Reduced trials noticed no heterogeneity in CV mortality, even though the EMPEROR-Reduced trial did not significantly reduce CV mortality. Therefore, whether patients with HFrEF have diabetes, dapagliflozin, and empagliflozin are recommended with an ACEI/ARNi, MRAs, and a beta-blocker. Due to their diuretic/natriuretic effects, SGLT2i has additional advantages in reducing congestion and may reduce the need for loop diuretics [36]. According to the meta-analysis of two trials, DAPA-HF and DELIVER, dapagliflozin reduced the risk of death from cardiovascular causes, death from any cause, total hospital admissions for heart failure, and major adverse cardiovascular events (MACEs). The study suggests that dapagliflozin could be an effective treatment for patients with heart failure regardless of ejection fraction [55]. Sotagliflozin has also been demonstrated in hospitalized patients with diabetes and HF and was found to reduce CV death and hospitalization

Table 6 Newer therapies in HF management

Agent name	Mechanism	Clinical trial registry number	Sample size	Outcomes
Omecamtiv mecarbil	A myosin-specific activator that directly targets the contractile mechanism in the sarcomere by increasing the number of myosin heads that can pull on actin filaments to produce force during systole	NCT01300013	614 patients with AHF	Failed to meet the primary endpoint of dyspnea improvement, Increased SET
		NCT01786512	544 patients with HF	Increased SET and stroke volume, Decreased heart rate and NT-proBNP level
Ularitide	Exerts pharmacological actions such as vasodilation, diuresis, and natriuresis through the natriuretic peptide receptor/particulate guanylate cyclase/cyclic guanosine monophosphate pathway	NCT01661634	2157 patients with AHF	No significant differences in primary endpoints, Significant dyspnea reduction in 83% of eligible patients
Serelaxin	Recombinant human relaxin inhibits contractions of the uterus and may play a role in the timing of delivery. Relaxin works by simultaneously cutting collagen production and increasing collagen breakdown	NCT00520806	1161 patients hospitalized for AHF	VAS scale dyspnea improvement, Fewer deaths at day 180
		NCT01870778	6600 patients with AHF	Failed to meet primary endpoints (180-day cardiovascular death and worsening heart failure through day 5)
		NCT02007720	1520 patients with AHF	Terminated based on RELAX-AHF-2 study results
Tolvaptan	A selective and competitive arginine vasopressin receptor 2 antagonist	NCT01651156	244 patients with HF	Reduced heart failure symptoms such as lower limb edema, pulmonary congestion, or dyspnea
		NCT00071331	4133 patients with HF	No improvement in HRQOL score and mortality, Dyspnea relief

Table 6 continued

Agent name	Mechanism	Clinical trial registry number	Sample size	Outcomes
SERCA2a	Controls both the rate of cytosolic Ca^{2+} removal and the degree of SR Ca^{2+} load, representing a fundamental determinant of both cardiac relaxation and contraction	NCT01643330	250 patients with HF	Lack of improvement in patient's clinical course

HF heart failure, *AHF* acute heart failure, *VAS* visual analogue scale, *HRQOL* health-related quality of life, Ca^{2+} calcium ion, *SR* sarcoplasmic reticulum, *SET* systolic ejection time, *NT-proBNP* N-terminal prohormone of brain natriuretic peptide, *RELAX-AHF* relaxin in acute heart failure

for HF. However, treatment involving SGLT2i might increase the likelihood of recurring genital fungal infections and a minor decline in eGFR upon initiation. However, this reduction is reversible and should not prompt premature discontinuation of the medication [36].

Novel Therapies for Heart Failure

In recent years, research has unveiled novel routes and molecular targets that play crucial roles in the progression of HF. This understanding has led to the development of newer pharmacological drugs that specifically target these sites, offering promising prospects for HF treatment. However, it is important to note that despite their potential benefits, these innovative medications may not be readily available in resource-limited settings due to factors such as cost and infrastructure constraints. Thus, while these advancements hold great promise for improving HF management, their widespread accessibility remains a challenge in certain healthcare environments (Table 6) [57].

Unmet Need in HF Management

There is an unmet requirement for establishing evidence-based therapy for each patient individually with better understanding of pathogenesis of HF. The expertise required in interpreting the results of imaging has to be improved. Hemodynamic sensors/non-invasive strips that can help monitor filling pressure can help de-escalate the dose of diuretics. Controlling risk factors for better clinical outcomes is essential. Even with symptomatic disease, significant barriers to early diagnosis and treatment of HF remain, such as poor awareness of the disease among the general population and suboptimal diagnosis by non-specialist healthcare practitioners, who may have limited access to diagnostic tools such as echocardiography. This is especially concerning in light of the variable clinical presentation of HF and the symptoms (shortness of breath and exercise intolerance) of the conditions with common

comorbidities, such as chronic obstructive pulmonary disease, chronic kidney disease (CKD), anemia, and diabetes mellitus. Delays in HF diagnosis are linked to more extended treatment periods, prolonged hospital stays, and death [58].

FINAL CONSENSUS STATEMENTS

Sr no.	Consensus statement
1	Diagnosis of heart failure relies on clinical suspicion and physical examination, aided by ECG, chest X-ray, NT-proBNP, and 2D echocardiography
2	Referral decisions should not delay the initiation or optimization of prognostic-modifying therapy
3	Management of heart failure should be individualized based on each patient's clinical characteristics, comorbidities, and preferences
4	Increasing physician awareness to address the clinical inertia is crucial in tackling the problem, particularly among HF specialists who can develop strategies to alleviate it
5	The approach to improve the compliance to HF therapy involves educating and counseling patients to increase their knowledge about HF therapy
6	Despite substantial support for the Health Impact Fund, there are concerns about scalability, generalizability, and the impact on access to medicines
7	GDMT for patients of HF is the same irrespective of the presence or absence of diabetes mellitus
8	SGLT2i shall be recommended in all individuals with HF with High cardiovascular risk
9	Consider initiating or continuing SGLT2i in patients with acute heart failure (once the patient is stabilized) regardless of diabetes status
10	ARNi is the first-line therapy in individuals with diabetes and HFrEF and is preferred to ACEI or ARB
11	Regular monitoring of serum potassium levels is needed with the use of MRAs and other RAAS blockers in patients with HF
12	SGLT2i therapy improves renal and cardiovascular outcomes in patients with chronic kidney disease regardless of diabetes status
13	SGLT2i is effective for the treatment of heart failure regardless of ejection fraction

CONCLUSIONS

Heart failure prevention remains a major health priority in India. Optimum utilization of GDMT is required to improve the outcomes in patients with HF. GDMT shall be initiated as early as possible in patients with HF. Emerging data supports the use of SGLT2i across the spectrum of HF with or without diabetes. Novel therapies such as vericiguat may have the potential to address the unmet need in the management of HF. Emphasis should be given to patient education, cardiac rehabilitation, drug access, and health care policy to improve HF outcomes in resource-limited settings.

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Declarations

Conflict of Interest. Rajnish Dhediya, Kumar Gaurav, Rajan Mittal, and Bhavesh Kotak are the employees of Dr. Reddy's laboratories. Peeyush Jain, Santanu Guha, Soumitra Kumar, J P S Sawhney, Kamal Sharma, K P Sureshkumar, and Ashwani Mehta have declared no conflicts of interest.

Ethical Approval. This article is based on previously conducted studies and does not contain any new studies with human participants or animals performed by any of the authors. All 150 healthcare professionals were informed that a consensus paper would be developed based on the meeting discussions.

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