

Guideline-Directed Medical Treatment (GDMT) of Heart Failure at Kauvery Hospitals: A Clinical Audit

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Abstract

Aim

Ample evidence now exists to prove that Guideline Directed Medical Treatment (GDMT) of Heart Failure (HF) reduces the mortality and morbidity of patients with heart failure during hospitalization, prevents their repeated hospitalizations and thus improves their quality of life.

Approximately 1 in 4 patients admitted with worsening heart failure die, or are readmitted within 30 days of discharge. GDMT, instituted early during hospitalization, can mitigate the substantial morbidity and mortality and also reduce the cost to the health service.

Methods

This is an observational study, to evaluate the application of GDMT to patients with Heart Failure in Kauvery Hospitals.

Keywords

Heart failure, Ejection fraction, GDMT, Kauvery Hospital.

Background

Heart failure (HF) is a complex clinical syndrome that involves abnormalities in the structure or function of the heart, thereby reducing cardiac output and impairing the delivery of blood to metabolizing tissues. Patients with HF present to tertiary care with clinical features such as ankle swelling, shortness of breath and orthopnea. Once heart failure is diagnosed, pharmacological treatment needs to be initiated as soon as possible to improve patient outcomes. The New York Heart Association (NYHA) or World Health Organization (WHO) functional classification systems help in assessing baseline symptom severity and to guide treatment decisions. This audit hopes to encourage healthcare professionals to ensure that patients diagnosed with heart failure receive optimal care.[1]

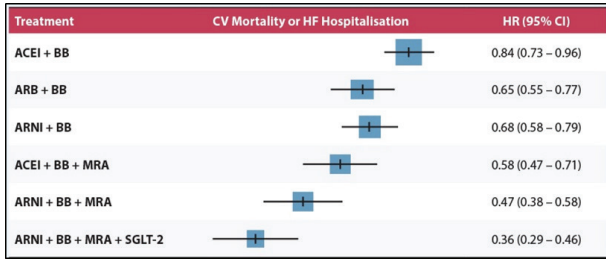
Four Pillars of Heart failure Treatment

- 1) ACEs/ARBs/ Angiotensin Receptor-Neprilysin Inhibitors (ARNIs)
- 2) Cardio selective Beta Blockers
- 3) Mineralocorticoid Receptor Antagonists (MRA)
- 4) Sodium-Glucose Co-Transporter 2 (SGLT-2) inhibitors

GDMT to patients with Heart Failure with reduced ejection fraction (HFrEF) is generally administered as:

- 1) Prescription of a loop diuretic if the patient presents with significant fluid overload.
- 2) Treatment is instituted with an ACE inhibitor or an ARB, and a cardio selective beta blocker.
 - These medicines are ideally started at a low dose and then up-titrated to the maximum tolerated or specified dose.
 - Alternative is an ARNI (sacubitril + valsartan), and stopping the ACE inhibitor/ARB. ARNI can be also a first-choice drug instead of the ACE/ARB.
- 3) If the patient is still symptomatic despite maximum tolerated doses, a mineralocorticoid receptor antagonist (MRA) such as spironolactone or the newer MRAs (Eplerenone, Finerenone) is added.
- 4) SGL2 inhibitors have emerged as one of the pillars of GDMT whether the patient has diabetes or not.

Additional medicines are exhibited based on the patient's co-morbidities- eg anticoagulants, vasodilators, digoxin, iron etc



HR = Hazard ratio; CL = Clearance Level

Fig (1). The risk of cardiovascular mortality or hospitalization related to heart failure in patients with HFrEF compared with ACE inhibitor treatment alone. Adapted from Tromp et al, 2022.[2]

Audit Methods and Materials

We initiated a prospective, observational, and hospital-based audit of use of GDMT in Heart Failure. This audit identified patients who were diagnosed with either heart failure or an undifferentiated clinical diagnosis such as Severe LV, Pulmonary Oedema, and ADHF etc. The audit inquired whether their treatment regimen was consistent with GDMT or whether they were receiving only diuretics or partially administered GDMT. This audit did not focus on patients with HFpEF as, currently, the management differs, and is being directed by cardiologist’s preferences.

A total of 100 patients, admitted over 1 year (November 2022 to October 2023) at various units of Kauvery Hospital were selected for the purposes of this audit to allow for a reasonable treatment initiation and up-titration period.

Data collection

Clinical pharmacists working in each hospital, identified by the respective investigators, were trained to collect relevant data of admissions with HF using a structured questionnaire. A standardized set of definitions for patient-related variables and clinical data were used. The data captured included demographics, aetiology of HF where evident, medical history, clinical presentation, in-hospital diagnostics and treatment. ‘Guideline-based’ medical treatment was defined as a combination of an angiotensin converting enzyme inhibitor (ACEI) or angiotensin receptor blocker (ARB) or ARNI, a cardio selective beta-blocker, aldosterone receptor blocker and SGLT2i, in patients with reduced left ventricular systolic dysfunction as determined by EF. We estimated the proportion of patients receiving

this package of guideline-based care during the hospitalization.[3]

Results

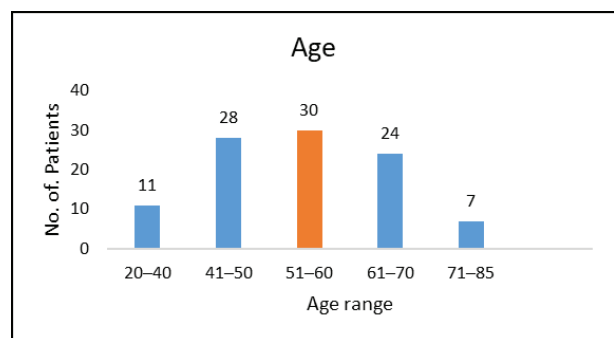
1. Demographic Characteristics

A total of 100 patients, admitted to the participating hospitals with HF during the study period were included. The mean (SD) age of the population was 54.89 (11.87). In this study population, most common affected age group was 51–60 (30%), followed by 41–50 (28%). It was painful to note that 11% of patients were in the 20–40 age group.

Table (1): Demographic characteristics of study population

Age	Count	%
20–40	11	11
41–50	28	28
51–60	30	30
61–70	24	24
71–85	7	7

Graph (1): Age range of affected study population



2. Clinical Characteristics

All the study patients were analysed based on their diagnoses.

Among them only 11% of patients were diagnosed as congestive heart failure. Most of the patients came with the complaint of breathlessness (52%).

The prevalence of cardiac risk factors in this study population was hypertension (48%), diabetes (54%), history of CAD (43%) and history of CKD (23%).

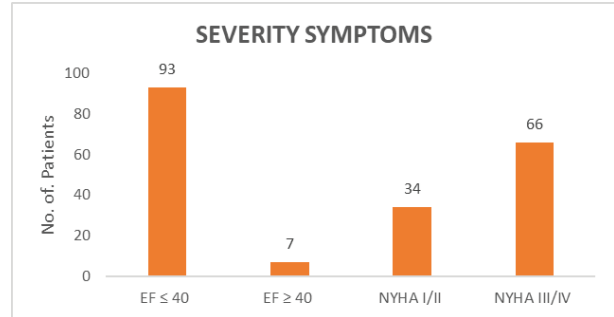
The majority (65%) of diagnosed patients came under NYHA class (III, IV). Patients with left ventricular (LV) ejection fraction lesser than or equal to 40%, (defined as heart failure with reduced EF) constituted 93% of the population.

Table (2): Characteristics of study population

Variables	Total (N = 100)
Age in years, mean (SD)	54.89 (11.87)
Congestive heart failure	11
Mortality	0
Chief Complaints	
Breathlessness	52
Chest pain	9
Miscellaneous	39
History of hypertension, n (%)	48 (48%)
History of diabetes, n (%)	54 (54%)
History of CAD, n (%)	43 (43%)
History of CKD, n (%)	23 (23%)
History of Hypothyroidism (%)	7 (7%)
NYHA Class III, IV. (%)	65 (65%)
LVEF <40%, n (%)	93 (93%)

SD, standard deviation; NYHA, New York Heart Association; COPD, chronic obstructive pulmonary disease, CKD, chronic kidney disease; LVEF, left ventricular ejection fraction.[4]

Graph (2): Severity symptoms of heart failure in study population



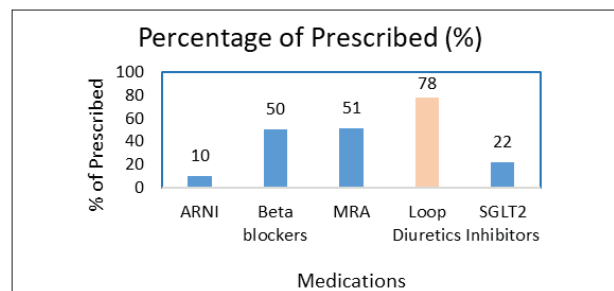
3. Analysis of Evidenced based prescription for HFrEF patients

In the 100 patients with reduced ejection fraction majority (78%) were prescribed Loop diuretics. 51% received MRA drugs, 50% Beta blockers and 22% of SGLT2 Inhibitors. Only 10% of study patients received ARNI [5]

Table (3): Prescription percentage of evidenced based medications in the study population

Medications	Percentage of Prescribed (%)
ARNI	10
Beta blockers	50
MRA	51
Loop Diuretics	78
SGLT2 Inhibitors	22

Graph (2): Prescription percentage of evidenced based medications in the study population



Discussion

1) Heart failure poses severe healthcare challenges and affects economies of the families affected, and the countries where they are most prevalent. HF remains mostly unrecognized, and when recognized, inadequately treated.

2) The prevalence of HF is increasing exponentially and poses rising costs to healthcare systems. Heart Failure clinics, and hospitalization when required, helps to diagnose and treat early with GDMT.

3) In Kauvery Hospitals we organized an observational audit on the recognition of heart failure and its medical management by instituting GDMT.

4) In our study we followed 100 patients from various units of Kauvery Hospitals who were either diagnosed to have heart failure or were at risk of heart failure by analyzing their presentation, comorbidities and presence of HFrEF. We used NYHA (New York Heart Association) class to assess the severity of heart failure.[6]

5) The management of HF patients mandates diligent follow-up, with focus on symptoms, physical evaluation cardiac parameters and basic hematological and biochemical indices.

6) Most of the patients had breathlessness as the chief disability. Patients could be clinically identified as heart failure, or at risk of heart failure, with or without ischemia. Offering them better management with GDMT is an important strategy to reduce the incidence of HF in the community and admissions to the hospital, and is the key to reduce the mortality.[7]

7) Benefits of the treatment are best realized with guideline-based therapy. SGLT2 Inhibitors have emerged as a promising cardio protective agent in patients with or without Diabetes and /or CKD. Even though, there was a majority of DM patients, only a few patients were prescribed with SGLT2 Inhibitors.[8] The prescription rate of ARNI was also low. Physician adherence to GDMT is limited. MRA prescription percentage was quite good but most patients received beta blockers and loop diuretics only. There is an urgent need to offer GDMT to all eligible patients. There is no Mortality was recorded during this HF Study.

Conclusion

Hospitalization is a key location for initiation of guideline based HFrEF therapy. Lower prescription rate

of GDMT indicates a reluctance to initiate and adhere to GDMT during hospitalization and through follow – up clinics.[9] All patients with clinical diagnosis of heart failure merit guideline-based therapy to be initiated at the earliest. That shall lower the community. It is possible identify, investigate and manage patients with HF in the community. Physician's adherence to the evidence based GDMT shall lead to a better outcome in the management of heart failure. [10]

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