



Original Article

Clinical Inertia in Terms of Recurrent Hospitalization in the Treatment of Heart Failure Between General Physicians and Cardiologists

Kaleem Ullah Shaikh¹, Abeer Sarfaraz^{1*}, Sana Sarfaraz², Muhammad Wasiq Anwar¹, Falaknaz Salari¹ and Faryal Fatima¹¹Department of Cardiology, Liaquat National Hospital and Medical College, Karachi, Pakistan²Department of Pharmacology and Pharmaceutical Sciences, University of Karachi, Karachi, Pakistan

ARTICLE INFO

Key Words:

Heart Failure, Recurrent Hospitalization, Clinical Inertia

How to Cite:

Shaikh, K. U., Sarfaraz, A., Sarfaraz, S., Anwar, M. W., Salari, F., & Fatima, F. (2024). Clinical Inertia in Terms of Recurrent Hospitalization in the Treatment of Heart Failure Between General Physicians and Cardiologists : Clinical Inertia in Terms of Recurrent Hospitalization in the Treatment of Heart Failure . Pakistan BioMedical Journal, 7(01). <https://doi.org/10.54393/pbmj.v7i01.1025>

*Corresponding Author:

Abeer Sarfaraz

Department of Cardiology, Liaquat National Hospital and Medical College, Karachi, Pakistan
abeer_sana@hotmail.comReceived Date: 10th January, 2024Acceptance Date: 30th January, 2024Published Date: 31st January, 2024

ABSTRACT

Cardiologists are more likely to use clinical guideline-supported therapies than general physicians, a fact that has been shown to reduce readmissions. **Objective:** To compare the intensification of heart failure treatment and its course with re-hospitalization among general physicians and cardiologists at a tertiary care hospital. **Methodology:** An observational cross-sectional study was conducted in the cardiology inpatient department of a tertiary care hospital from June 2023 to December 2023 for six months. All patients admitted with acute decompensated heart failure with reduced ejection fraction were included. The treatment prescriptions that they had been followed before the event were noted along with the fact that whether they were treated by a cardiologist or a general physician, and their compliance with medical treatment was recorded. Frequencies and percentages were computed for qualitative variables. **Results:** A statistically significant association of re-admission was observed among cardiologists (1.40 ± 0.57) compared to general physicians (2.54 ± 0.57 ; $p < 0.001$). Almost 100% of cardiologists advised beta blockers as compared to their prescription by 42% of general physicians. All cardiologists advised ARBS/ACE inhibitors as compared to 58% of general physicians. 90% of cardiologists advised aldosterone receptor antagonists as compared to 10% of general physicians. Only 12% of cardiologists advised SGLT-2 inhibitors as compared to 88% of physicians. Overall, 36% of cardiologists recommended guideline-mediated therapy while 12% of general physicians recommended guideline-mediated therapy. **Conclusions:** Cardiologist care is significantly associated with reduced re-admissions among patients re-admitted after heart failure treatment.

INTRODUCTION

Heart failure (HF) is a widespread health issue that is becoming more prevalent worldwide. It has significant negative effects on mortality and morbidity, including low quality of life, reduced functional capacity, and substantial costs [1]. HF is not only an expensive long-term illness but also a potentially fatal one. The high rate of hospitalizations related to HF severely burdens our healthcare systems [2, 3]. Among adults, HF is the leading cause of hospitalization, and 1-year mortality rates range from 10% to 35% in several population-wide registries, which is significantly higher in patients with severe heart failure [4, 5]. It has been observed that a significant number of patients who are

discharged after being hospitalized for heart failure (HF) end up returning to the hospital within 30-60 days [6, 7]. This high rehospitalization rate is a cause for concern. Factors such as socioeconomic status, living in low-income neighborhoods, experiencing poverty, or lacking social support have been found to contribute to readmissions, along with the quality of the hospital [8, 9]. Reducing heart failure hospitalizations and readmissions is a national priority. Research shows that implementing disease management programs can reduce readmissions from heart failure by 30% and the combined endpoints of death and readmission by up to 18% [9, 10]. Studies have

shown that cardiologists have a higher success rate in lowering mortality rates in patients with heart disorders compared to general physicians [10, 11]. This is because they are more likely to follow clinical guidelines and have a better understanding of appropriate therapies for these types of ailments. If a patient with a cardiovascular ailment is being treated by a general practitioner, it is recommended that they be referred to a cardiologist for specialized care. After being discharged, it is now standard practice for patients with congestive heart failure (CHF) to receive early physician follow-up care. This has been linked to a decrease in 30-day readmissions, as evidenced by multiple studies [11, 12]. Heart disease patients treated by cardiologists had lower risks of pneumonia, septicemia, urinary tract infection, and in-hospital mortality (OR = 0.61, 0.49, 0.76, and 0.37, respectively) than those treated by physicians. Additionally, the average length of hospital stay for cardiologists' patients was shorter than physicians' patients (7.7 ± 19.7 vs. 5.7 ± 7.0 days) [12, 13]. In a country with limited resources and an abundance of heart disease scarce information is available regarding the general physicians versus cardiologist outcomes due to HF.

The purpose of this study is to compare the mean number of readmissions after the treatment of HF with general physicians versus cardiologists. Due to the rising burden of heart failure, such studies must be performed so that they will guide clinicians to treat patients well in time.

METHODOLOGY

After getting approval from the Institutional Ethical Review Committee with IRB number IBC KU-389/2023, this observational cross-sectional study was conducted from June to December 2023 in inpatients of a tertiary care hospital. All patients admitted with acute decompensated heart failure with reduced ejection fraction regardless of etiology were included. The treatment prescriptions that they had been followed before the event were noted along with the fact whether they were treated by a cardiologist or a general physician etc. and their compliance with medical treatment was recorded. Only those patients were included who had followed up to 3 OPD/6 weeks to their respective physicians for their treatment optimization prior to their decompensation. Before the enrolment of patients in the study, participants were briefed about the purpose of the research and its benefits, and a written consent was taken. The calculated sample size was 14 participants with 95% confidence level. Patients of both genders with ages ranging between 18 to 85 years, having ejection fraction (EF) < 40%, and on treatment of HF were included. Hypotensive patients and pregnant women were not part of this study. Patients with known malignancies, congenital heart disease, acute kidney injury, and chronic kidney disease were also not included. The New York Heart

Association (NYHA) classification system was used to assess the patient's functional class. All the demographic details of the patients, i.e. age, gender, body mass index, comorbid, systolic blood pressure, diastolic blood pressure, heart rate, any previous surgery /procedure, and medications were noted. The findings of echocardiography specifically EF was reported in all patients as per hospital protocol. The outcome of readmission was noted. All data was recorded by a principal investigator on a predesigned proforma. The SPSS version 26.0 was used for data compilation and analysis. Frequencies and percentages were computed for qualitative variables like gender, HTN (hypertension), DM (diabetes mellitus), smoking, family history of IHD (ischemic heart disease), addictions, NYHA functional class, medications, and history of procedures. Quantitative variables were presented as mean \pm SD like age, weight, height, body mass index, EF, SBP, DBP, heart rate and no of hospital readmission. The Shapiro-Wilk test was used to check the normality of the quantitative data. If the data is non-normal, the median and interquartile (IQR) were reported. Independent sample t- test or otherwise Mann-Whitney U test was applied (as appropriate) was used to compare mean readmission between two groups. The chi-square test was applied for finding association between categorical variables. Effect modifiers like age, gender, weight, height, body mass index, ejection fraction, SBP, DBP, heart rate, HTN, DM, anemia, smoking, family history of IHD, causes of heart failure, addictions, and NYHA functional. P-value \leq 0.05 was considered as significant in all analysis.

RESULTS

In our study, we enrolled one hundred patients being treated for acute decompensated heart failure at a tertiary care hospital. The mean age of patients was 53.17 ± 11.21 years. Out of which 67 were male, 83 were hypertensive, 50% were diabetic, 40% were smokers and 3% were alcoholic. The mean BMI of patients was 31.82 ± 1.76 . The patients admitted had a mean ejection fraction of 33.95 ± 5.47 , summarized in table 1.

Table 1: Baseline characteristics of the study population (N=100)

Demographics		N (%)
Age (years)		53.17 \pm 11.21
Gender	Male	67 (67)
	Female	33 (33)
Hypertensive		131 (85.6)
Smoker		131 (85.6)
Diabetic		22 (14.4)
Alcoholic		22 (14.4)
BMI		22 (14.4)
Ejection Fraction (%)		22 (14.4)

The systolic blood pressure, diastolic blood pressure, and heart rate were found as 119.50 ± 9.95 mmHg, 69.70 ± 6.37 mmHg, and 70.24 ± 3.66 bpm in the cardiologist group and 129.56 ± 15.90 mmHg, 78.50 ± 11.38 mmHg and 82.04 ± 7.89 bpm in physician group respectively. The systolic blood pressure, diastolic blood pressure, and heart rate had a statistically highly significant mean difference between cardiologists and general physicians ($p < 0.001$). According to the NYHA, 35 (70%) had ASA II and 15 (30%) had ASA III in the cardiologist group while 43 (86%) had ASA II and 7 (14%) had ASA III in the general physician group. The difference was also not statistically significant ($p = 0.053$). The results for the association of clinical findings with study groups are presented in table 2.

Table 2: Association of demographic and clinical findings with cardiologists and general physicians group.

Parameters	Health Professionals		Total Mean \pm SD	p-value
	Cardiologists (Mean \pm SD)	General Physicians (Mean \pm SD)		
Systolic blood pressure (mmHg)	119.50 \pm 9.95	129.56 \pm 15.90	124.531413	<0.001*
Diastolic blood pressure (mmHg)	69.70 \pm 6.37	78.50 \pm 11.38	74.10 \pm 10.19	<0.001*
Heart rate (bpm)	70.24 \pm 3.66	82.04 \pm 7.89	76.14 \pm 8.52	<0.001*
NYHA Functional class	N (%)	N (%)		
Class 2	35 (70)	43 (86)	78 (78)	0.053**
Class 3	15 (30)	7 (14)	22 (22)	

All 50 (100%) cardiologists advised beta blockers to their patients however, 21 (42%) of physicians advised beta blockers to their patients, this was significant ($p < 0.001$). All 50 (100%) cardiologists advised ARBS/ACE inhibitors to their patients while 29 (58%) physicians advised ARBS/ACE inhibitors to their patients, this was also significant ($p < 0.001$). A total of 45 (90%) cardiologists advised Aldosterone receptor antagonists to their patients however, just 5 (10%) of physicians advised Aldosterone receptor antagonists to their patients, this was also significant ($p < 0.001$). Only 6 (12%) cardiologists advised SGLT-2 inhibitors to their patients while 44 (88%) physicians advised SGLT-2 inhibitors to their patients, this was also significant ($p < 0.001$). Overall, 36% of cardiologists recommended guideline-mediated therapy while 12% of general physicians recommended guideline-mediated therapy ($p = 0.005$). The detailed results are also presented in table 3.

Table 3: Association of HF causes, and treatment given by cardiologists and general physicians group [N(%)]

Parameters	Health Professionals		Total (N=100)	p-value
	Cardiologist (N=50)	General Physicians (N=50)		
Beta-blockers				
Yes	48 (96)	23 (46)	71 (71)	<0.001*
No	2 (4)	27 (54)	29 (29)	
ARBS/ACE Inhibitors				
Yes	45 (90)	31 (62)	76 (76)	0.001*
No	5 (10)	19 (38)	24 (24)	
Aldosterone Receptor Antagonists				
Yes	37 (74)	11 (22)	48 (48)	<0.001*
No	13 (26)	39 (78)	52 (52)	
SGLT-2 Inhibitors				
Yes	37 (74)	12 (24)	49 (49)	<0.001*
No	13 (26)	38 (76)	51 (51)	
GDMT				
Yes	18 (36)	6 (12)	24 (24)	<0.001*
No	32 (64)	44 (88)	76 (76)	
Hospital re-admissions				
1	32 (64)	0 (0)	32 (32)	<0.001*
2	16 (32)	25 (50)	41 (41)	
3	2 (4)	23 (46)	25 (25)	
4	0 (0)	2 (4)	2 (2)	

The mean re-admission was noted as 1.40 ± 0.57 in those patients who were treated with cardiologist while 2.54 ± 0.57 in those who were treated with general physicians. We found a statistically significant association of re-admission among cardiologists and general physicians ($p < 0.001$). Results are represented in figure 1.

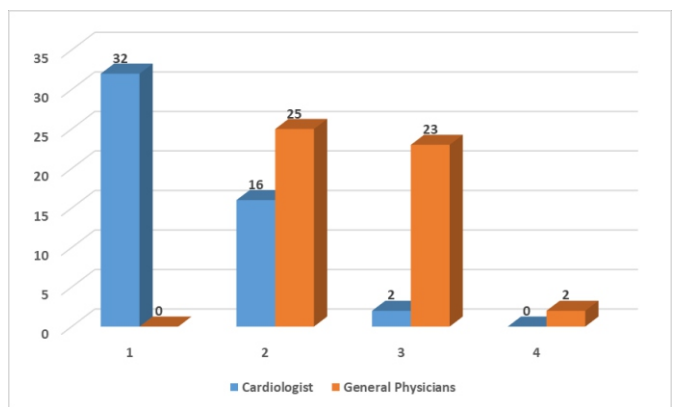


Figure 1: Number of hospital readmissions of patients between cardiologists and general physicians.

DISCUSSION

The study found that 36% of cardiologists and 12% of general practitioners suggested guideline-mediated therapy. Among general physicians, 42% recommended beta blockers, while all cardiologists gave this advice.

Additionally, the study found that the care provided by cardiologists resulted in significantly lower readmissions compared to the care provided by general practitioners. Heart failure remains the leading cause of hospitalization and mortality worldwide. It is associated with adverse outcomes such as hospitalization and death, making it a major public health concern of the 21st century [14]. Research shows that the new guideline-directed medical therapy (GDMT) is not being initiated early enough in the treatment of heart failure, despite explicit recommendations. Improving outpatient care for individuals with heart failure can reduce and prevent heart failure-related morbidity and mortality [15]. This study draws two important conclusions. First, patients received inadequate post-discharge care. Second, during the study period, nearly half of the heart failure patients experienced clinical inertia. In the weeks following a patient's discharge from the hospital due to heart failure, their medication usage does not seem to increase significantly, even though their condition is far from being under control. Despite improvements over time, there is still concern about the lack of adherence to recommended treatment guidelines, and various theories have been proposed to explain the discrepancy. Our study demonstrated that even after six weeks, physicians as compared to cardiologists did not recommend MRA to 90% of patients, only 42% received beta-blockers, and 58% received ACE-I (or ARB) whereas cardiologists also did not prescribe 88% of patients SGLT2 receptor inhibitors. In total, 12% of doctors and 36% of cardiologists suggested treatment that was guided by recommendations. Smeets M et al., reported that managing heart failure is a challenging and labor-intensive task that requires a great deal of experience. Young general practitioners often lack confidence and experience when dealing with these illnesses. However, elder general practitioners become more self-assured and take an active role in heart disease therapy as they gain experience. Despite age-related differences, some doctors may find it difficult to keep up with heart failure treatment due to difficult situations and impulsive decision-making [16]. In the same survey conducted by Smeets M et al., general practitioners (GPs) voiced concerns about how an increasing workload might affect their primary job. Additionally, the patient's comorbidities and polypharmacy make heart failure management particularly challenging. Some general practitioners also lack confidence and understanding in cardiology [17]. Hancock HC et al., pointed out that the challenge of caring for a large number of elderly patients and the lack of proper medical resources makes it difficult for general practitioners (GPs) to diagnose heart failure. As a result, a small number of GPs think that using natriuretic peptides, which have been

approved by guidelines, could help diagnose heart failure with greater certainty [18]. Wu YM et al., found that heart disease patients who received cardiology care while hospitalized had a lower 30-day risk of in-hospital death than those who received medical care from other doctors. Our investigation supports this finding [19].

We also discovered a strong correlation ($p=0.001$) between hospital readmissions and the treatment provided by general practitioners and cardiologists in research conducted by Driscoll A et al. However, individuals with related comorbidities have a higher than 50% probability of being hospitalized. According to our research, less than 50% of patients had received advice from their general practitioners about ACEI/ARBs [20]. A similar study conducted in Tanzania by Sadiq AM et al., also showed that ACEI/ARB deficiency is a risk factor for heart failure hospitalization. However, the study has some limitations, such as a small sample size, retrospective data collection from readmitted patients, and a single-center design [8]. However, this study can serve as a framework for future studies on a similar topic. We recommend experimental studies to compare the cardiologist and GPs treatment in patients with heart failure and improve the diagnostic and therapeutic procedures without any delay.

CONCLUSIONS

In conclusion, the study results showed that cardiologist care was associated with reduced re-admissions among patients re-admitted after heart failure treatments.

Authors Contribution

Conceptualization: KUS

Methodology: KUS, AS, SS, MWA, FS, FF

Formal analysis: AS, SS, MWA, FS, FF

Writing-review and editing: KUS, AS, SS, MWA, FS, FF

All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

The authors declare no conflict of interest.

Source of Funding

The author received no financial support for the research, authorship and/or publication of this article.

REFERENCES

- [1] Savarese G, Stolfo D, Sinagra G, Lund LH. Heart failure with mid-range or mildly reduced ejection fraction. *Nature Reviews Cardiology*. 2022 Feb; 19(2): 100-16. doi: 10.1038/s41569-021-00605-5.
- [2] Verhestraeten C, Heggermont WA, Maris M. Clinical inertia in the treatment of heart failure: a major issue to tackle. *Heart Failure Reviews*. 2021 Nov; 26: 1359-70. doi: 10.1007/s10741-020-09979-z.

- [3] Zahid FM, Ramzan S, Faisal S, Hussain I. Gender based survival prediction models for heart failure patients: A case study in Pakistan. *PloS one*. 2019 Feb; 14(2): e0210602. doi: 10.1371/journal.pone.0210602.
- [4] Ponikowski P, Voors AA, Anker SD, Bueno H, Cleland JG, Coats AJ et al. ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure. *Kardiologia Polska (Polish Heart Journal)*. 2016; 74(10): 1037-147. doi: 10.5603/KP.2016.0141.
- [5] Uthamalingam S, Kandala J, Selvaraj V, Martin W, Daley M, Patvardhan E et al. Outcomes of patients with acute decompensated heart failure managed by cardiologists versus non-cardiologists. *The American journal of cardiology*. 2015 Feb; 115(4): 466-71. doi: 10.1016/j.amjcard.2014.11.034.
- [6] Bhosale KH, Nath RK, Pandit N, Agarwal P, Khairnar S, Yadav B et al. Rate of Rehospitalization in 60 Days of Discharge and Its Determinants in Patients with Heart Failure with Reduced Ejection Fraction in a Tertiary Care Centre in India. *International Journal of Heart Failure*. 2020 Apr; 2(2): 131. doi: 10.36628/ijhf.2020.0007.
- [7] Álvarez-García J., Salamanca-Bautista P., Ferrero-Gregori A., Montero-Pérez-Barquero M., Puig T., Aramburu-Bodas Ó., et al. Prognostic impact of physician specialty on the prognosis of outpatients with heart failure: propensity matched analysis of the REDINSCOR and RICA registries. *Revista Española de Cardiología*. 2017 May; 70(5): 347-354. doi: 10.1016/j.rec.2016.12.026.
- [8] Sadiq AM, Chamba NG, Sadiq AM, Shao ER, Temu GA. Clinical characteristics and factors associated with heart failure readmission at a tertiary hospital in North-Eastern Tanzania. *Cardiology Research and Practice*. 2020 Apr; 2020. doi: 10.1155/2020/2562593.
- [9] Lenzi J, Avaldi VM, Molinazzi D, Descovich C, Urbinati S, Cappelli V, et al. Are degree of urbanisation and travel times to healthcare services associated with the processes of care and outcomes of heart failure? A retrospective cohort study based on administrative data. *Plos one*. 2019 Oct; 14(10): e0223845. doi: 10.1371/journal.pone.0223845.
- [10] Bekelman DB, Allen LA, McBryde CF, Hattler B, Fairclough DL, Havranek EP, et al. Effect of a collaborative care intervention vs usual care on health status of patients with chronic heart failure: the CASA randomized clinical trial. *JAMA Internal Medicine*. 2018 Apr; 178(4): 511-9. doi: 10.1001/jamainternmed.2017.8667.
- [11] Tung YC, Chang GM, Chang HY, Yu TH. Relationship between early physician follow-up and 30-day readmission after acute myocardial infarction and heart failure. *PLoS One*. 2017 Jan; 12(1): e0170061. doi: 10.1371/journal.pone.0170061.
- [12] Saxena FE, Bierman AS, Glazier RH, Wang X, Guan J, Lee DS, et al. Association of Early Physician Follow-up with Readmission Among Patients Hospitalized for Acute Myocardial Infarction, Congestive Heart Failure, or Chronic Obstructive Pulmonary Disease. *JAMA Network Open*. 2022 Jul; 5(7): e2222056. doi: 10.1001/jamanetworkopen.2022.22056.
- [13] Dabscheck E, George J, Hermann K, McDonald CF, McDonald VM, McNamara R, et al. COPD-X Australian guidelines for the diagnosis and management of chronic obstructive pulmonary disease: 2022 update. *Medical Journal of Australia*. 2022 Oct; 217(8): 415-23. doi: 10.5694/mja2.51708.
- [14] Huynh K. Dapagliflozin—a breakthrough in the search for drugs to treat HFrEF. *Nature Reviews Cardiology*. 2019 Dec; 16(12): 700. doi: 10.1038/s41569-019-0291-1.
- [15] Packer M, Anker SD, Butler J, Filippatos G, Pocock SJ, Carson P, et al. Cardiovascular and renal outcomes with empagliflozin in heart failure. *New England Journal of Medicine*. 2020 Oct; 383(15): 1413-24.
- [16] Smeets M, Zervas S, Leben H, Vermandere M, Janssens S, Mullens W, et al. General practitioners' perceptions about their role in current and future heart failure care: an exploratory qualitative study. *BMC Health Services Research*. 2019 Dec; 19(432): 1-0. doi: 10.1186/s12913-019-4271-2.
- [17] Smeets M, Van Roy S, Aertgeerts B, Vermandere M, Vaes B. Improving care for heart failure patients in primary care, GPs' perceptions: a qualitative evidence synthesis. *BMJ Open*. 2016 Nov; 6(11): e013459. doi: 10.1136/bmjopen-2016-013459.
- [18] Hancock HC, Close H, Fuat A, Murphy JJ, Hungin AP, Mason JM. Barriers to accurate diagnosis and effective management of heart failure have not changed in the past 10 years: a qualitative study and national survey. *BMJ Open*. 2014 Apr; 4(3): e003866. doi: 10.1136/bmjopen-2013-003866.
- [19] Wu YM, Liu CC, Yeh CC, Sung LC, Lin CS, Cherng YG, et al. Hospitalization outcome of heart diseases between patients who received medical care by cardiologists and non-cardiologist physicians: A propensity-score matched study. *PLoS One*. 2020 Jul; 15(7): e0235207. doi: 10.1371/journal.pone.0235207.
- [20] Driscoll A, Meagher S, Kennedy R, Hay M, Banerji J, Campbell D, et al. What is the impact of systems of care for heart failure on patients diagnosed with heart failure: a systematic review. *BMC Cardiovascular Disorders*. 2016 Dec; 16(1): 1-20. doi: 10.1186/s12872-016-0371-7.