

Etiological Spectrum and Risk Factors of Heart Failure Among Patients Admitted in Bharatpur Hospital

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ABSTRACT

Background: Heart failure (HF) is a major public health concern globally and increasingly prevalent in low and middle-income countries like Nepal. Understanding its etiological spectrum and associated risk factors is essential for formulating effective prevention and management strategies.

Methods: A cross-sectional descriptive study was conducted among 210 adult patients admitted with heart failure to Bharatpur Hospital from January to December 2023. Data on demographics, clinical features, risk factors, and etiologies were collected through structured questionnaires and clinical evaluations, including echocardiography. Statistical analysis was performed using SPSS version 20.

Results: The mean age of patients was 62.4 ± 12.7 years, with a male predominance (65.7%). The leading risk factors identified were hypertension (65.7%), diabetes mellitus (48.6%), physical inactivity (48.6%), and dyslipidemia (40%). Dyspnea on exertion (94.3%) was the most common presenting symptom. Ischemic heart disease emerged as the predominant etiology (48.6%), followed by hypertensive cardiomyopathy (25.7%) and valvular heart disease (17.1%).

Conclusion: Ischemic and hypertensive heart diseases are the primary causes of HF among hospitalized patients in Bharatpur, with a high prevalence of modifiable risk factors. These findings highlight the urgent need for community based prevention strategies and integrated cardiovascular risk management at the primary care level.

Keywords: heart failure; ischemic heart disease; risk factors; Bharatpur Hospital.

INTRODUCTION

Heart failure (HF) is a significant global health concern characterized by the heart's inability to pump sufficient blood to meet the metabolic requirements of the body. It remains a leading cause of morbidity and mortality across various populations. In Bharatpur, a growing body of evidence indicates a rising incidence of HF among hospitalized patients, reflecting a complex interplay of etiological factors and underlying risks. One of the recent study in Bharatpur Hospital had shown that heart failure was the most common diagnosis among subjects admitted under cardiology unit figuring at 46.60%.¹ Identifying the diverse causes of heart failure and associated risk factors is essential for developing targeted intervention strategies. Common etiologies include ischemic heart disease, hypertensive heart disease,

and cardiomyopathies, which vary significantly in prevalence among different demographic groups.² Moreover, risk factors such as advanced age, diabetes mellitus, hypertension, and lifestyle choices contribute substantially to the burden of heart failure cases in this region.^{3,4} A thorough understanding of these factors is crucial for healthcare providers at Bharatpur Hospital to enhance patient outcomes and implement effective preventive measures. This article aims to examine the etiological spectrum and identify key risk factors contributing to heart failure among patients admitted to Bharatpur Hospital, fostering further research and clinical focus in this critical area.

METHODS

This study utilized a cross-sectional descriptive design to assess the etiological spectrum and risk factors of

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heart failure among patients admitted to Bharatpur Hospital from January 2023 to December 2023. The design was chosen to provide a comprehensive snapshot of the clinical characteristics and associated factors of heart failure within this specific patient population, allowing for efficient data collection and analysis. The study population consisted of adult patients (aged 18 and above) who were diagnosed with heart failure during their hospital admission. A convenience sampling method was employed to select eligible patients, ensuring representation from various demographic backgrounds. Patients with a history of acute myocardial infarction or those with severe comorbid conditions were excluded from the study. Data were collected through a structured questionnaire designed to capture relevant clinical and demographic information, including age, gender, medical history, lifestyle factors (smoking, alcohol use, and exercise), and details regarding the causal classification of heart failure. Clinical diagnosis of heart failure was confirmed using echocardiography and clinical criteria as per the guidelines from the American College of Cardiology and the American Heart Association. Data were analyzed using statistical software (SPSS version 16). Descriptive statistics were employed to summarize demographic characteristics and the prevalence of various etiologies and risk factors associated with heart failure. Chi-square tests and logistic regression analysis were performed to identify significant associations between categorical variables. A p-value of less than 0.05 was considered statistically significant.

This study was conducted in accordance with ethical guidelines, and approval was obtained from the Institutional Review Committee of Bharatpur Hospital. Informed consent was obtained from all participants prior to data collection, ensuring confidentiality and the right to withdraw from the study at any time. This methodology aims to effectively identify and understand the various factors contributing to heart failure in the catchment area of Bharatpur Hospital, providing insights that may inform clinical practice and public health initiatives.

RESULTS

A total of 210 subjects with heart failure were included in the study. The mean age was 62.4 ± 12.7 years, with a range of 35 to 85 years. The demographic and risk factor profiles are summarized in Table 1.

Table 1. Demographic characteristics and risk factors of study subjects. (n=210)

Variables	Frequency (%)
Age Group (years)	
35-44	36 (17.1%)
45-54	48 (22.9%)
55-64	60 (28.6%)
65-74	42 (20.0%)
≥75	24 (11.4%)
Sex	
Male	138 (65.7%)
Female	72 (34.3%)
Hypertension	138 (65.7%)
Diabetes Mellitus	102 (48.6%)
Dyslipidemia	84 (40.0%)
Obesity (BMI ≥30)	66 (31.4%)
Physical Inactivity	102 (48.6%)
Alcohol Consumption	54 (25.7%)
Smoking	78 (37.1%)

The most common presenting symptoms observed among the subjects were dyspnea on exertion, orthopnea, and edema. The prevalences are detailed in Table 2.

Table 2. Presenting symptoms and their prevalence.

Symptoms	Frequency (%)
Dyspnea on exertion	198 (94.3%)
Orthopnea	156 (74.3%)
Paroxysmal nocturnal dyspnea	102 (48.6%)
Fatigue	108 (51.4%)
Edema of ankles	150 (71.4%)
Palpitations	66 (31.4%)

The etiological classification reveals ischemic heart disease as the most common cause, followed by hypertensive cardiomyopathy and valvular heart diseases. The distribution is summarized in Figure 1. The pie chart visually illustrates that ischemic heart disease constitutes nearly half of the cases (48%), followed by hypertensive (26%) and valvular causes (17%) (Figure 1).

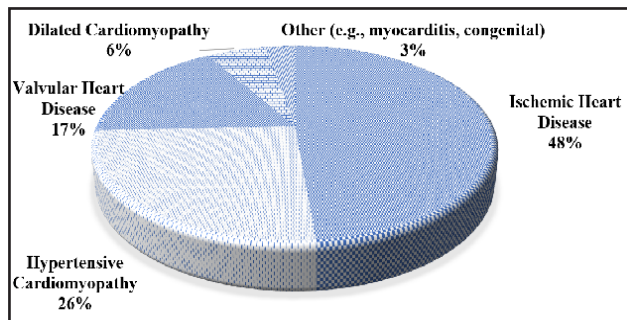


Figure 1. Pie chart of etiological spectrum of heart failure.

Table 3. Etiological spectrum of heart failure.

Etiology	Frequency (%)
Ischemic Heart Disease	102 (48.6%)
Hypertensive Cardiomyopathy	54 (25.7%)
Valvular Heart Disease	36 (17.1%)
Dilated Cardiomyopathy	12 (5.7%)
Other (e.g., myocarditis, congenital, peripartum cardiomyopathy)	6 (2.9%)

DISCUSSION

This study investigated the etiological spectrum and associated risk factors of heart failure (HF) among patients admitted to Bharatpur Hospital, offering insight into the causes and risk factors of heart failure and its clinical profile. The findings align with global patterns while also reflecting some region-specific trends, particularly in the distribution of risk factors and underlying causes. The majority of the study population was male (65.7%), with a mean age of 62.4 ± 12.7 years, highlighting the greater prevalence of HF in older individuals and a potential gender disparity. This male predominance is consistent with previous studies conducted in South Asia and other developing regions, where men often have higher exposure to cardiovascular risk factors and greater access to healthcare services compared to women.^{5,6} Hypertension has emerged as the most prevalent risk factor (65.7%), followed by diabetes mellitus (48.6%) and physical inactivity (48.6%). This pattern underscores the growing burden of non-communicable diseases (NCDs) in Nepal and similar low- and middle-income countries. Hypertension and diabetes are well-established contributors to both systolic and diastolic dysfunction, leading to heart failure through mechanisms such as left ventricular

hypertrophy, myocardial fibrosis, and microvascular disease.⁷ Dyslipidemia (40%) and obesity (31.4%) also contributed significantly, consistent with the ongoing epidemiological transition from infectious to lifestyle-related diseases. The rates of smoking (37.1%) and alcohol consumption (25.7%) further highlight modifiable behavioral risk factors that require targeted community interventions. These lifestyle elements have been directly implicated in endothelial dysfunction, myocardial ischemia, and cardiomyopathy.⁸

Dyspnea on exertion was the most common presenting symptom (94.3%), followed by orthopnea (74.3%) and edema (71.4%). These findings mirror the classical symptomatology of congestive heart failure as reported in large cohorts such as the Framingham Heart Study.⁹ Notably, the prevalence of paroxysmal nocturnal dyspnea (48.6%) and fatigue (51.4%) reflects the extent of functional limitation and systemic congestion at presentation, often exacerbated by delays in seeking care or limited access to early diagnostic services.

Ischemic heart disease (IHD) was identified as the leading etiology, accounting for 48.6% of cases. This finding reinforces the shifting landscape of heart failure in South Asia from rheumatic and valvular causes to ischemic and hypertensive origins, as previously observed in urbanizing populations.¹⁰ The high prevalence of hypertension (25.7% as a direct etiology) and its dual role as both a risk factor and primary cause of cardiomyopathy emphasizes the importance of early detection and long-term control of blood pressure. Valvular heart disease accounted for 17.1% of HF cases, indicating that rheumatic heart disease remains a significant concern in Nepal, likely due to unmet needs in primary prevention and rheumatic fever management.¹¹ Dilated cardiomyopathy and other less common causes including peripartum cardiomyopathy collectively comprised 8.6% of cases, suggesting that genetic, viral, and idiopathic mechanisms continue to play a minor but important role in heart failure in this setting. The findings call for a multi-pronged public health approach, emphasizing lifestyle modification,

early diagnosis, and aggressive management of hypertension, diabetes, and dyslipidemia. Given the predominance of IHD and hypertensive heart disease, integration of cardiovascular risk screening into primary care could substantially reduce the burden of advanced HF. In addition, enhancing awareness and treatment adherence for existing cardiovascular conditions may delay disease progression.

CONCLUSIONS

This study underscores ischemic heart disease and hypertension as the leading causes of heart failure in patients admitted to Bharatpur Hospital. The high prevalence of modifiable risk factors points to the urgent need for preventive cardiology initiatives. A coordinated effort at both community and healthcare system levels will be essential in curbing the rising tide of heart failure in Nepal.

Limitation: This study was hospital-based and may not reflect the burden or distribution of HF etiologies in the broader community. Additionally, diagnostic tools such as interventional and CT coronary angiography or cardiac MRI, which can more precisely classify HF subtypes were not available, potentially limiting the granularity of etiological classification.

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REFERENCE

1. Gautam, M. P., Bhattarai, S., Kandel, S., Panjiyar, R., & Shrestha, B. (2024). Spectrum of Cardiovascular Diseases in the Cardiology Unit of Bharatpur Hospital. *Journal of National Heart and Lung Society Nepal*, 3(2), 69–75. [DOI]
2. Cowie MR, Mosterd A, Wood DA, Deckers JW, Poole-Wilson PA, Sutton GC, Grobbee DE. The epidemiology of heart failure. *Eur Heart J*. 1997;18(2):208-25. [DOI]
3. Lawson CA, Zaccardi F, Squire I, Okhai H, Davies M, Huang W, Mamas M, Lam CSP, Khunti K, Kadam UT. Risk Factors for Heart Failure: 20-Year Population-Based Trends by Sex, Socioeconomic Status, and Ethnicity. *Circ Heart Fail*. 2020;13:e006472. [DOI]
4. Yancy CW, Jessup M, Bozkurt B, Butler J, Casey Jr DE, Colvin MM et al. WRITING COMMITTEE MEMBERS. 2016 ACC/AHA/HFSA Focused Update on New Pharmacological Therapy for Heart Failure: An Update of the 2013 ACCF/AHA Guideline for the Management of Heart Failure: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines and the Heart Failure Society of America. *Circulation* 2016;134(13):e282-e293. [DOI]
5. Pillai HS, Ganapathi S. Heart failure in South Asia. *Curr Cardiol Rev*. 2013;9(2):102-111. [DOI]
6. GBD 2019 Diseases and Injuries Collaborators. Global burden of 369 diseases and injuries in 204 countries and territories. *The Lancet* 2020;396(10258):1204–22. [Link]
7. Yancy CW, Jessup M, Bozkurt B, Butler J, Casey DE, Colvin MM et al. 2017 ACC/AHA/HFSA Focused Update of the 2013 ACCF/AHA Guideline for the Management of Heart Failure. *Journal of the American College of Cardiology* 2017;70(6):776–803. [Google Scholar]
8. Chilazi M, Duffy EY, Thakkar A, Michos ED. COVID and cardiovascular disease: what we know in 2021. *Current atherosclerosis reports*. 2021 Jul;23(7):37. [Link]
9. Ho KK, Anderson KM, Kannel WB, Grossman W, Levy D. Survival after the onset of congestive heart failure in Framingham Heart Study subjects. *Circulation*. 1993;88(1):107-115. [DOI]
10. Martinez-Amezcuca P, Haque W, Khera R, Kanaya AM, Sattar N, Lam CSP et al. The Upcoming Epidemic of Heart Failure in South

Asia. *Circ Heart Fail.* 2020;13(10):e007218.
[DOI]

11. Carapetis JR, Steer AC, Mulholland EK, Weber

M. The global burden of group A streptococcal diseases. *The Lancet Infectious Diseases* 2005; 5(11):685–94. [DOI]

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