

Research Letter

Epidemiology and Management of Heart Failure in Nepal

The burden of heart failure (HF) is high in low-and middle-income countries because of limited infrastructure, technology, and resources.^{1,2} Nepal is a developing country of ~30 million multi-ethnic and multilingual people with diverse topography and is situated in Southern Asia, between China and India.³ Cardiovascular disease is one of the leading causes of death in Nepal.⁴ Data on HF is sparse in Nepal; a handful of studies are limited to HF patient profiles.⁵ With increasing globalization, aging population, hypertension, and coronary heart disease⁴ the prevalence and burden of HF is expected to rise and become a public health priority in Nepal. Therefore, studies on epidemiology and management of HF are crucial to inform appropriate strategies for improving patients' access to evidence-based therapies and multidisciplinary care programs in Nepal.

We conducted a cross-sectional, observational, study with a primary objective to establish baseline sociodemographic and clinical characteristics of hospitalized patients with HF. Using prospective consecutive sampling, 221 participants were enrolled in the study from 3 leading hospitals in Nepal: Shahid Gangalal National Heart Centre (SGNHC), Manmohan Cardiothoracic Vascular and Transplant Center, and Norvic International Hospital. Participants were enrolled in the study from May 2018 to August 2018. Following ethical approvals, patients with a confirmed diagnosis of HF, who could speak and understand Nepali, provided informed consent. Data were collected in the 2-page, paper-based, case report form used in the New South Wales HF Snapshot Study.⁶ Additionally, self-care was measured using the Nepali Self-Care of HF Index.⁷ The total score for each self-care scale (maintenance, management, and confidence) was standardized to range from 0 to 100; a score of 70 was considered cut-point for self-care adequacy.

Table 1 displays the sociodemographic, clinical, and self-care characteristics of the participants. The mean (SD) age of the participants was 57.5 (15.76) years. The most prevalent causes of HF were cardiomyopathy (36%), ischemic heart disease (31%), hypertension (23%), and rheumatic heart disease (RHD; 23%). Majority of the participants were admitted via the emergency department

(86%). Ischemia (42%), infection (10%), and arrhythmia (12%) were the common precipitants for the hospital admission. Ischemic heart disease (42%), RHD (24%), and diabetes (30%) were documented comorbidities in participants. Discharge medications included loop diuretics (90%), angiotensin-converting enzyme inhibitor (61%), antiplatelet (57%), lipid-lowering agent (55%), and beta-blocker (49%). Very few participants reported adequate self-care maintenance (1%), management (8%), and confidence (4%). Approximately 2% patients died during hospitalization, the majority were discharged home (97%) and the mean (SD) duration of hospitalization was 7 (5) days.

The mean age of the patients' and common causes of HF, such as cardiomyopathy, RHD, and hypertension, were consistent with the prior data from African and Asian countries.⁸ In contrast to previous findings,⁹ ischemic heart disease was also a common cause of HF in this study. Part of this is because of epidemiologic transition and increasing Western lifestyle of the people. Another prevalent cause of HF and comorbidity in this sample was RHD. RHD is one of the leading 3 reasons for cardiology admission and the second reason behind cardiac surgery at SGNHC, the national referral center of cardiology and surgery in Kathmandu, Nepal.⁹

Regarding the management of HF in this sample, the rate of prescription of beta-blockers at discharge was higher than the rates reported in other HF studies in Nepal.⁵ Still, discharge medication use was not optimal. Further, the data identified inadequate self-care among most of the participants in this sample. More studies are required to ensure adequate validity and reliability of Nepali self-care measures and to examine the sociodemographic and clinical factors (ie, patients' education, skill, disease severity, and self-care motivation) influencing self-care.¹⁰ Additionally, further studies are required to assess provider related (ie, knowledge and competency of HF care providers, nature of discharge teaching) and system-related (ie, availability of resources) factors affecting self-care.

The high numbers of younger individuals and home discharge underscores the importance of community-based models of HF care. Enhanced disease awareness, improved control of hypertension, better access to revascularization services, appropriate treatment of valvular heart disease, and focusing healthy lifestyle should be considered. Additionally, increasing adherence to evidence-based practices through culturally appropriate

Table 1. Socio-Demographic, Clinical, and Self-Care Characteristics

Variables	Frequency (%) or Mean (SD)
Demographic characteristics	
Age	57.5 (15.76)
Sex (Male)	136 (61.8)
Patient lives alone	10 (4.5)
Employed	77 (35.0)
Risk factors	
Ischemic heart disease	92 (41.6)
Rheumatic heart disease	54 (24.4)
Diabetes	66 (30.0)
Renal disease	19 (8.6)
Chronic pulmonary disease	15 (6.8)
Smoking status	
Never smoked	79 (36.4)
Ex-smoker	126 (58.1)
Current smoker	12 (5.5)
Weight (at discharge)	57.9 (13.15)
Heart failure etiology	
Rheumatic heart disease	50 (22.6)
High blood pressure	51 (23.1)
Cardiomyopathy	79 (35.7)
Ischemic heart disease	68 (30.8)
Other	17 (7.7)
Severity of left ventricular ejection fraction (from echo)	
Normal	5 (2.3)
Mild	19 (8.7)
Moderate	95 (43.4)
Severe	100 (45.7)
Admission pathway	
Emergency	189 (85.9)
Direct to ward	31 (14.1)
Precipitant for admission	
Ischemia	93 (42.1)
Infection	23 (10.4)
Arrhythmia	27 (12.2)
Medication	5 (2.3)
Diet or fluid	10 (4.5)
Other	63 (28.5)
Rhythm on admission	
Sinus rhythm	154 (69.7)
Arterial fibrillation	54 (24.4)
Medical treatment received during admission	
IV Diuretics	199 (90.0)
IV GTN	25 (11.3)
IV Inotrope	60 (27.3)
Dialysis	9 (4.1)
Oxygen therapy	146 (66.1)
CPAP/BIPAP	12 (5.5)
CPR	6 (2.7)
Invasive MV	14 (6.3)
Clinical profile	
Systolic blood pressure on admission (mmHg)	109.8 (21.05)
Diastolic blood pressure on admission (mmHg)	69.7 (12.26)
Sodium at discharge (mEq/L)	135.7 (5.40)
Potassium at discharge (mEq/L)	4.2 (0.54)
Creatinine at discharge (mg/dL)	1.1 (0.76)
Hemoglobin at discharge (g/dL)	12.5 (1.91)
Discharge pharmacotherapy	
Angiotensin-converting-enzyme inhibitor	136 (61.5)
Angiotensin II receptor blocker	37 (16.7)
Beta-blocker	109 (49.3)
Digitalis	68 (30.8)
Anti-arrhythmic	37 (16.8)
Nitrate	74 (33.5)

(continued)

Table 1 (Continued)

Variables	Frequency (%) or Mean (SD)
Aldosterone antagonist	74 (33.5)
Loop diuretic	200 (90.5)
Vasodilator	12 (5.4)
Lipid lowering agent	121 (54.8)
Anti-platelets	126 (57.0)
Anticoagulant	72 (32.6)
Thiazide	26 (16.3)
Calcium channel blocker	49 (22.2)
New York Heart Association class (at discharge)	
Class I	19 (8.8)
Class II	141 (65.0)
Class III	51 (23.5)
Class IV	6 (2.8)
AKPS (at discharge)	
Normal to normal activity with effort	71 (32.1)
Cares for self (unable to do active work) to requires considerable assistance	136 (61.5)
In bed more than 50% to Dead	14 (6.3)
Discharge outcome	
Discharged home	215 (97.3)
Transferred to another medical facility	2 (0.9)
Died	4 (1.8)
Days stay for hospitalization	7.3 (5.38)
Adequate self-care (score ≥ 70)	
Self-care maintenance (n=220)	1 (0.5)
Self-care management (n=178)	15 (8.4)
Self-care confidence (n=220)	9 (4.1)

AKPS, Australia-modified Karnofsky Performance Scale; BIPAP, bi-level positive airway pressure; CPAP, continuous positive airway pressure; CPR, cardiopulmonary resuscitation; GTN, glyceryl trinitrate; IV, intravenous; MV, mechanical ventilation.

interventions at the level of patient, provider, and health-care system are urgently needed as well as strategies to monitor HF in Nepal.

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Supplementary materials

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