Nigerian Medical Journal
NIGERIA MEDICAL ASSOCIATION
Print ISSN 0300-1652, E-ISSN 2229-774X

Original Article

The Pattern of Cardiac Disease Admissions and Outcomes among Medical Admissions in St. Paul Hospital Millennium Medical College: A Retrospective Study

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Abstract

Background: The epidemic of cardiovascular diseases (CVD) is a global phenomenon, and approximately 80% of all cardiovascular-related deaths occur in low and middle-income countries including Ethiopia. The aim of this study was to determine the pattern of cardiac admission and its outcome among the annual medical admissions in Addis Ababa.

Method: This was a retrospective, cross-sectional study to evaluate the pattern of cardiac diseases and outcomes among medical admissions at St Paul Specialized Hospital Millennium Medical College from the 1st of Jan 2020 to the 1st of Jan 2021.

Results: The proportion of cardiac admission was 26% among 1,165 medical admissions. The most common cardiac admission was advanced congestive heart failure (CHF) (74% (224)), followed by hypertensive heart disease (HHD) (48.5%) and valvular heart disease (VHD)(23.5%), respectively. Chronic Rheumatic valvular heart disease (CRVHD) was 91.5% of the total VHD and was significantly higher among rural residents and younger populations ($p<0.001$). Over 12% of CRVHD patients were complicated with cardio-embolic stroke, constituting one-third of the total annual ischemic stroke admissions. Hypertension ((54%,) (164)) was the leading risk factor and was more common among urban residents ($p=0.001$). The mean duration of total hospital stay was 18.33 days. In-hospital mortality was 23.8% and was associated with shorter hospital stays ($p<0.001$). The most common immediate cause of death was sepsis of chest focus with multiorgan failure(27.8%), followed by fatal arrhythmia (20.8%) and brain herniation (15.3%), respectively.

Conclusion: Cardiac diseases are common in the study area causing significant mortality among medical admissions. Therefore, early risk assessment, adequate disease control, and stringent inpatient care should be among the priorities to reduce cardiovascular morbidity and mortality.

Keywords: Pattern of Cardiac Diseases; Admission; Ethiopia.

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How to cite this article: Mengistu MD. The Pattern of Cardiac Disease Admissions and Outcomes among Medical Admissions in St. Paul Hospital Millennium Medical College: A Retrospective Study. Niger Med J 2023;64(2):183-195.

Quick Response Code:

Introduction

Worldwide, non-communicable diseases (NCDs) are the leading cause of death, accounting for 73.4% of all deaths while communicable, maternal, neonatal, and nutritional (CMNN) causes accounted for 18·6% and injuries 8·0%[1]. In high-income Western countries, NCDs are the leading cause of morbidity and mortality and account for 90% of all deaths, with the leading NCDs being CVDs [2]. NCDs are the second most common cause of death in sub-Saharan Africa (SSA) accounting for 2.6 million deaths, equivalent to about 35% of all deaths, after a composite of communicable, maternal, neonatal, and nutritional diseases (CMNNDs). In SSA, cardiovascular diseases (CVDs) are the most frequent causes of NCDs deaths [1,2]. Due to the increasing burden of NCDs globally, the 2011 UN High-Level Meeting made a political declaration aimed at achieving the goal of a 25% reduction in premature NCD mortality by 2025 (the 25 by 25 goal) [3], which was further emphasized in the UN Sustainable Development Goals (SDGs) in 2015 to reduce by one-third premature mortality from NCDs by 2030[4].

The surge of cardiovascular disease (CVD) is a global phenomenon, and the magnitude in terms of incidence and prevalence increases in the developing world. It remained the leading cause of death in the world and approximately 80% of all cardiovascular-related deaths occur in low and middle-income countries and at a younger age[5,6,7]. An almost twofold increase in the overall number of CVD-related deaths since 1990 has been reported, with more than a 10% difference in mortality among women compared with men [8].The leading causes of heart failure in SSA are hypertensive heart disease, cardiomyopathy, and rheumatic heart disease, constituting over 75% of cases of heart failure[2,9]. In SSA, ischemic heart disease contributes to <10% of heart failure as compared to > 50% in high-income countries [2,9]. Furthermore, the levels of hypertension diagnosis, treatment, and control are at <40%, <35%, and 10-20%, respectively, and more than 40% of patients with diabetes are not aware of their diagnosis in SSA[2].

In the cardiac outpatient follow-up clinic of Jimma Referral Hospital of Ethiopia, rheumatic heart disease was the leading cause of cardiac disease (32.8%) in 2010 followed by hypertensive heart disease (24.2%), and cardiomyopathy (20.2%) [10]. Studies over the last five decades also demonstrated that rheumatic heart disease had been the leading cause of cardiac disease followed by hypertensive heart disease [10,11,12,13]. However, there is an epidemiologic transition in recent years where hypertensive heart disease seems to have been taking the lead [14,15]. The study conducted in the follow-up referral clinics of Gondar Hospital in 2017 showed that hypertensive heart disease was the leading cause of cardiac disease, followed by rheumatic heart disease, arrhythmia, degenerative heart disease, dilated cardiomyopathy (DCMP), and ischemic heart disease (IHD) in decreasing order [14]. A similar study in 2022 also showed that HHD was the leading cause of cardiac disease followed by RHD[15]. There is a paucity of data regarding the burden of cardiac diseases among medical admissions and the pattern of cardiac diseases among medical admission. This study, therefore, aimed to evaluate the burden and pattern of cardiac disease among year-round medical admissions at St Paul specialized hospital Millennium Medical College, Addis Ababa.

Methodology

The study was conducted at St Paul Millennium Medical College (SPHMMC) which is one of the two largest governmental specialized teaching Hospitals in Addis Ababa, the Capital of Ethiopia, and the seat of the African Union. The hospital receives follow-up patients, emergency patients, and referrals from other Hospitals in the country and health centers in the catchment area. This institutional-based, retrospective, cross-sectional study was conducted to evaluate the pattern of cardiac admissions among the medical admissions in the medical ward and ICU from the 1st of January 2020to the 1st of January 2021. Admission and discharge diagnosis was used from the registry to retrieve the chart of the patient for a detailed review of demographic data, major investigations, co-morbidities, underlying background risk factors, and previous treatment history and follow-up.

The study included all eligible cardiac admissions among all the medical patients admitted at the study hospital during the study period. A total of 303 patients with cardiac diagnosis among the annual medical admission's of 1165 patients were evaluated during the specified study period. The exclusion criteria included patients whose medical records were lost, incomplete data, or patients who died before adequate diagnosis was made. The main blocks of the WHO International Classification of Diseases (ICD)-10th version for Mortality and Morbidity Statistics (MMS) (Version: 04 / 2019) [16] were utilized to sort out the final diagnoses. The unit of analysis was the hospital discharge and/or admission, not the patient, and therefore patients admitted more than once in a year were counted each time as a separate "admission" from the hospital. In situations with more than one cardiac diagnosis in the same case, the different disease conditions were counted separately.

Operational definition

Rheumatic valvular Heart Disease (RVHD) was defined according to WHF[17] criteria: A) Pathological MR and at least two of the following morphological features of RHD of the MV: anterior mitral valve leaflet (AMVL) thickening ≥3mm (age-specific), Chordal thickening, Restricted leaflet motion, Excessive leaflet tip motion during systole, B) MS mean gradient ≥4 mmHg, C) Pathological AR and at least two of the following morphological features of RHD of the AV: Irregular or focal thickening, Coaptation defect, Restricted leaflet motion, and Prolapse.

Hypertensive heart disease (HHD) was diagnosed in patients with hypertension presenting with any or combination of the following abnormalities: left ventricular diastolic dysfunction, left ventricular hypertrophy, left ventricular systolic dysfunction, and dilated left atrium, a surrogate of impaired LV filling in the absence of significant valvular heart disease or regional wall motion abnormality [18,19].

Dilated cardiomyopathy was diagnosed in patients with marked LV dilatation and dysfunction in the absence of significant valvular, structural, or congenital heart disease or arterial hypertension [19].

Ischaemic heart disease (IHD) included three entities: 1. Angina pectoris which is short-lived, relieved with the termination of the provoking factor or, rest, and had no typical ECG features of infarction, 2. Acute myocardial infarction which was defined by the presence of elevated cardiac biomarkers together with acute onset chest pain, and/or typical ECG changes, 3. Prior myocardial infarction including patients who present with or without heart failure in whom echocardiography detected regional wall motion abnormality in the absence of a history of the acute coronary syndrome[19]. Pathologic Q waves on ECG were used to predict the possibility of ischaemia as a cause of the regional wall motion abnormality in a dilated left ventricle with reduced ejection fraction.

Cor pulmonale: right heart failure due to altered structure and/or function of the right ventricle evidenced by 2-dimensional echocardiography.

Pericardial Effusion was diagnosed when there is echo-free space between the visceral and parietal pericardium.

Hypertension control: Controlled BP when the BP < 140/90 mmHg in hypertensive patients of all ages and Uncontrolled BP when the BP ≥ 140/90 mmHg in hypertensive patients of all ages [20].

Glycemic control: Good glycemic control when the mean fasting blood sugar is 80-130 mg/dL and /or HbA1C <7% and Poor glycemic control when mean Fasting blood sugar >130 mg/dL and/or HbA1C>7% [21].

Data collection and instrument

In order to ensure the accuracy, completeness, and comparability of data, four final-year medical. Residents were trained to complete the data collection format. Data collection was made by pretested structured checklists to document all the pertinent profiles of the study subjects.

Data Processing and Statistical Analysis

In order to ensure the accuracy, completeness, and comparability of data, final-year medical residents were trained to complete the data collection format. Data collection was made by pretested structured checklists to document all the pertinent profiles of the study subjects. After checking for completeness, data was coded, entered, and analyzed using SPSS version 20 software. Descriptive statistics were used to calculate rates. Chi-square was used to estimate the associations between selected predictor variables. A p-value <0.05 was taken as statistically significant.

Ethical Approval

The study was conducted according to the principle of Helsinki. Ethical clearance was obtained from the institutional review board (IRB) of St. Paul Teaching Hospital. Since it was a retrospective study, written consent was not obtained. The anonymity of the patient's profile was upheld.

Results

From the 1st of January 2020 to the 1st of January 2021, a total of 1165 patients were admitted to the medical ward and ICU, of which 303(26%) had cardiac diseases of diverse underlying etiologies. In the study, females accounted for about 59% of cardiac admissions and about half of the patients were urban residents (Addis Ababa (51.5%(156)) whereas the remaining half were from different regional states of Ethiopia with Oromia regional state taking the lion's share((39.3%)(119)), Southern Ethiopia 4.6%(14), Amhara 3.6%(11) and others 1%(3). Over 60% of cardiac patients were at least 45 years of age with 34% of patients having an age range of above 60 years, and the mean age was 51.2 years as shown in Table 1.

Table 1: Demographic profiles and clinical characteristics of cardiac admissions

Characteristics	Categories	Number	Percent
Sex	Female	178	58.7
	Male	125	41.3
Residence	Urban	156	51.5
	Rural	147	48.5
Age group in years	<30	50	16.5
	30-44	63	20.8
	45-60	87	28.7
	>60	103	34
Hypertension	Yes	164	54.1
	No	139	45.9
Duration of Hypertension Since diagnosis (in years)	0(not on antihypertensive)	54	32.9
	1-5	35	21.3
	6-10	35	21.3
	11-15	18	11
	>15	22	13.4
Hypertension control	Good HTN control	32	19.5
	Poorly controlled HTN	132	80.5
Diabetes	Yes	60	19.8
	No	243	80.2

Duration of DM Since diagnosis (in years)	0(not on anti-DM med)	7	11.6
	1-10	34	56.7
	>10	19	31.7
CKD	Yes	66	21.7
	No	237	78.4

More than half of all cardiac patients ((54%) (164)) admitted during the study period had hypertension, with the duration of hypertension ranging from 0 up to over 30 years. Over one-third of patients with hypertension were newly diagnosed during their current admission. Those with newly diagnosed hypertension had a significantly higher rate of cardiac diseases in terms of Congestive heart failure (CHF) (p=0.001), and hypertensive heart disease (HHD) (p=0.001). Good control of hypertension (blood pressure <140/90mmHg) among the admitted cardiac patients was only 19.5%, poor hypertension control (blood pressure ≥140/90mmHg) was 46.34%, and 34.14% of hypertensive patients were newly diagnosed for hypertension. Hypertension was more common among urban residents than rural residents (64% (105) Vs 36% (59), p=0.001) and the control of hypertension was much higher among urban residents than rural ones (p=0.001).

Among patients with cardiac admission, about 20% of them had diabetes mellitus, with the duration of diabetes ranging from newly diagnosed to a maximum of 25 years. Of all the diabetic patients, about 40%(24) patients had good glycemic control with mean fasting blood sugar of ≤ 130 mg/dL and /or HbA1C <7% whereas the remaining 60%(36) of patients had poor adherence to anti-diabetic medications and hence poor glycemic control with mean Fasting blood sugar >130 mg/dL and/or HbA1C>7%. Among diabetic patients, about 12% of them were diagnosed to have diabetes after they were admitted with the present cardiac diseases. About 76% of the diabetic patients were from an urban area and the remaining 24% were from a rural area with urban residence being significantly associated with good glycemic control (33% Vs 7%, p=0.001).

The pattern of cardiac diseases among the medical admissions at St Paul Hospital Millennium Medical College was classified according to the ICD-10 classifications of diseases [16]. The most common cardiac admission during the study period was advanced congestive heart failure (NYHA class III and IV) which accounted for about 74% (224) of cardiac admissions with diverse underlying etiologies (Table 2). The burden of CHF did not differ in terms of residence (Urban Vs Rural) and sex(p=0.09) but increasing age is significantly associated with an increased risk of CHF(p=0.001). The most common underlying etiology of CHF and the second most common cardiac disease was Hypertensive heart disease(40.5%(147)), followed by valvular heart disease(23.5%(71)) with the vast majority being Rheumatic valvular heart disease(RVHD) (91.5%(65/71) and the rest being degenerative valvular heart disease(2%(6)), Arrhythmia(22.1%(67) (most were being atrial fibrillation), and cor pulmonale (13.5%(41))(COPD accounted for about half of Cor pulmonale and the rest were caused by Chronic PTE(26.8%), Post-TB fibrosis(19.5%) and Interstitial lung disease (ILD)(2.4%)). Ischemic heart disease (IHD) constituted about 13.2% (41) of cardiac diseases and was significantly associated with older age (p=0.002), male sex(p<0.001), the presence of Diabetes mellitus as well as hypertension and poor hypertension control (p<0.001 each).

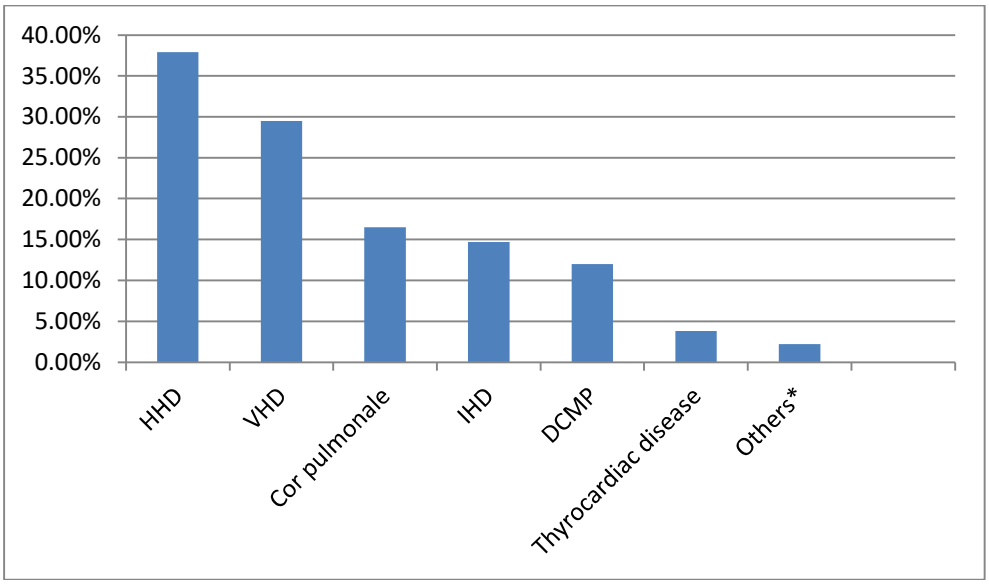
Table 2" Type of cardiac disease among medical admissions at St Paul specialized hospital Millennium Medical College

Type of cardiac disease	frequency	percentage
CHF	224	73.9%
HHD	147	48.5%
VHD	71	23.5%
Arrhythmia	67	22.1%
Cor pulmonale	41	13.5%
IHD	40	13.2%
DCMP	32	10.6%
SBE	11	3.63%
Intracavity Thrombus	10	3.3%
Thyrocardiac disease	8	2.6%
pericarditis	6	2%
High output failure	2	0.6%

Hypertensive heart disease (HHD) was the leading underlying cause of congestive heart failure (CHF) contributing to 37.9%(85) cases of advanced CHF(NYHA Class III and IV) requiring admission (Fig 1). Of the total number of patients with HHD, over 57% of them had advanced CHF. HHD was significantly increased with age (p=0.001), and urban residents had a higher burden of HHD compared to rural residents (p=0.001). However, there was no sex difference in the relative burden of HHD (p>0.05). Over 82% of patients with advanced CHF (NYHA Class III and IV) caused by HHD had poor hypertension control. Two-thirds of patients with advanced CHF due to HHD also had a stroke (75% of ischemic stroke and all cases of hemorrhagic stroke).

Valvular heart disease (VHD) was the second most common cardiac disease and the second most common cause of advanced CHF. Isolated MS and MS with MR were the most common echo-confirmed valvular lesions among the VHD patients (Fig 1). CRVHD was significantly higher in rural residents than urban dwellers (p<0.001), and much higher among younger populations than older ones (p<0.001). Over 12% of patients with CRVHD were complicated with cardio-embolic stroke, which constituted one-third of the total annual admissions of ischemic stroke. Despite the CRVHD being much higher among females than males ((60% (39) Vs 40% (26)), the difference was not statistically significant(p=0.054).

Precipitating factors contributed to exacerbations of heart failure (HF) causing substantial morbidity and mortality. Among patients with CHF, uncontrolled hypertension was the leading precipitating factor (32% (72)), followed by community-acquired pneumonia (CAP)(29%(65)). A quarter of HF patients who were taking oral medications had discontinued their medications leading to exacerbation of the symptoms mandating hospital admission as shown in Fig 2. Atrial fibrillation with a fast ventricular response and pregnancy were also among the major precipitating factors of CHF contributing to 24.5% and 10.26% of CHF admissions, respectively.



***pericarditis, and high output failure**

Figure 1: Major causes of congestive heart failure among cardiac patients at St Paul Specialized Hospital Millennium Medical College

Table 3: Echocardiographic findings of valve abnormalities

Echo findings of valve lesions	No	Percent
MS	14	21.5%
MR	9	13.8%
MS + MR	17	26.2%
MS + MR + AR	7	10.8%
MR + AR	6	9.2%
Others	12	18.46%

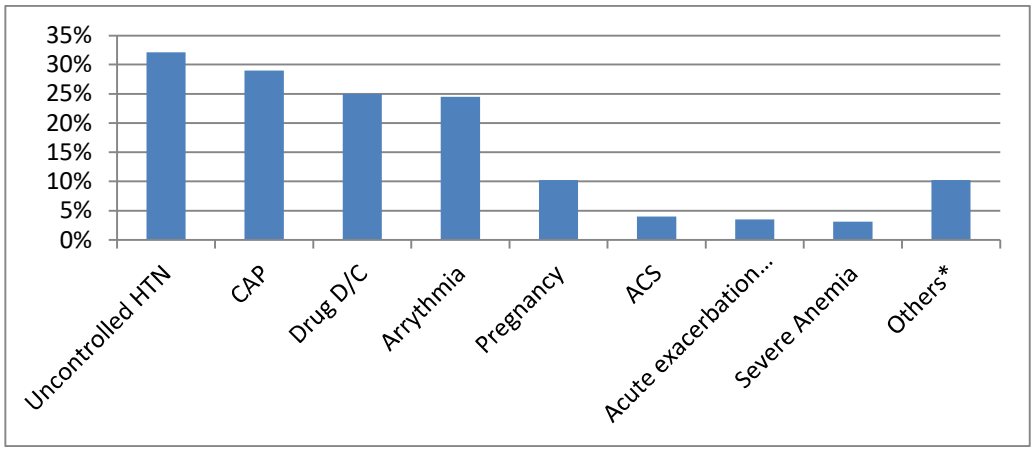


Figure 2: The major precipitating factor for CHF(class III and IV) patients admitted to medical ward and ICU of St Paul Hospital Millennium Medical College. *Acute PTE, SBE, and thyrotoxicosis

The outcomes of admission were assessed mainly in terms of the duration of the hospital stay, the fate of the patient at the end of the hospital stay, and the common immediate causes of death. The minimum duration of hospital stay was zero hours with the maximum being 80 days. The mean duration of total hospital stay was 18.33 days. About half of all patients with cardiac admission stayed in the hospital for up to two weeks and over a quarter of patients stayed for more than three weeks (Table 4). Among the year-round cardiac admissions, Close to 57% of patients were discharged with marked improvement, whereas 11.6% of patients were discharged with the same condition, most of them being stage-D CHF(Refractory to medical therapy) and cardiac patients who were discharged with almost the same degree of weakness after they were complicated with dense hemiplegia secondary to stroke. The rate of in-hospital mortality among cardiac admissions was 23.8%. In-hospital death was associated with shorter hospital stays ($p<0.001$) as 45% of in-hospital mortality occurred in the first week of hospital admission and only 15% of death rate was documented after four weeks of hospital stay. The mortality rate increased with increasing age but it was not statistically significant($p>0.05$). The most common immediate cause of death was sepsis of chest focus with multiorgan failure(27.8%), followed by fatal arrhythmias (20.8%) and brain herniation (15.3%), respectively (Table 4). Cardiogenic shock was attributable to 14% of immediate causes of death and 14% of patients died suddenly with no clearly identified cause of death.

Table 4: Admission outcomes of Cardiac patients admitted to the Medical ward and ICU of St Paul Specialized Hospital Millennium Medical College

Admission outcomes	Categories	Frequency	Percent
Total Duration of Hospital Stay (days)	0-7days	51	16.8
	8-14days	97	32
	15-21days	67	22.1
	22-28days	33	10.9
	>28days	54	17.8
Admission Outcomes	Discharged improved	172	56.8
	Discharged the same	35	11.6
	LAMA*	7	2.3
	Absconded	1	0.3
	In Hospital death	72	23.8
Immediate Causes of In-Hospital Death	Sepsis and Septic shock	20	27.8
	Fatal Arrhythmia	15	20.8
	Brain Herniation	11	15.3
	Cardiogenic Shock	10	13.9
	Sudden cardiac arrest 20 to ??	10	13.9
	Massive PTE	4	5.6
	MI	2	2.8
	Massive Aspiration	1	1.4

Discussion

Cardiovascular diseases (CVDs) remain the leading cause of death in the world and approximately 80% of all CVD-related deaths occur in low and middle-income countries [5]. Among the annual 1,165 medical admissions at St Paul Specialized Hospital Millennium Medical College, the proportion of cardiac diseases was 26%, constituting more than a quarter of annual medical admissions to the medical ward and ICU. The rate of cardiac admission in the present study was greater than the relative burden of 8.2% cardiac admission in Ghana [22] and 13.6%-15% in Nigeria [23,24,25], and 16% in Cameroon [26]. The current cardiac burden in the urban and semi-urban dominated setup was associated with a higher prevalence of hypertension and HHD as compared to data in some African countries [23,24,25].

The other plausible explanation could be that the present study included both the medical ward and ICU admissions contrary to only ward admissions in the previous studies. A study conducted by Giday and Woldeyes (2015) revealed that cardiovascular admissions constituted the bulk of ICU admission in Addis Ababa [27].

The pattern of cardiac diseases among the admitted patients at St Paul Hospital Millennium Medical College was classified according to the ICD-10 classifications of diseases [16]. Advanced congestive heart failure (NYHA class III and IV) was the leading cause of hospital admission (74%) among all cardiac patients. This finding is consistent with many studies in Ethiopia and Africa [22,24,28,29]. In patients with heart failure, identifying one or combinations of precipitating factors worsening the heart failure is important, since addressing such factors carefully can improve short and long-term clinical outcomes and can reduce repeated re-hospitalization [30]. Uncontrolled hypertension, infection particularly community-acquired pneumonia (CAP), drug discontinuation or non-adherence, and atrial fibrillation with fast ventricular response were the four major precipitating factors in the present study, respectively. This is consistent with previous studies conducted among heart failure patients [30]. The high burden of hypertension (54%) among cardiac patients in the study area was compounded by poor hypertension control (80%). Over one-third of hypertensive patients had undiagnosed hypertension and came to the hospital lately seeking medical attention after complications with hypertensive end-organ damage. The distressingly low level of hypertension control is consistent with control rate of 10-20% in sub-Saharan Africa [2]. There was a high level of drug discontinuation as a precipitating factor of congestive heart failure (25%), only next to hypertension and infection, followed by uncontrolled heart rate in patients with atrial fibrillation. The importance of our findings is consistent with the suggestion that compliance with medications might prove to be a cost-effective strategy to reduce mortality, morbidity and the cost of hospitalizations [31].

Hypertensive heart disease (HHD) was the second most common cardiac disease among cardiac admissions. HHD was also the leading cause of CHF, and uncontrolled hypertension was the leading precipitating factor worsening the existing heart failure mandating hospital admission. Unlike the previous outpatient studies where RVHD was the top cardiac disease followed by HHD[10,11,28,29,32], the current inpatient findings with HHD surpassing RVHD suggest that, at least in urban and semi-urban areas, there is changing trend in the relative burden of the spectrum of cardiac diseases. The finding of a high burden of HHD is also consistent with other inpatient and outpatient studies [14, 22, 23]. The current shifting trend might be partly justified by the increased prevalence of hypertension (54%) in the study area, which is consistent with the burden of hypertension (64%) and HHD among cardiac patients in Gondar Referral Hospital [14]. Therefore, hypertension screening and control, together with raising public awareness to reduce the risks must be among the priorities in our healthcare system.

Cor pulmonale, ischemic heart disease, and dilated cardiomyopathy were also common causes of cardiac admission and were the third, fourth, and fifth causes of heart failure in the current study, respectively. Cor pulmonale was attributable to 13.5% of all cardiac admission and 16.5% of advanced CHF, with COPD being the leading cause (51%), followed by chronic PTE (27%) and post-TB fibrosis (19.5%). This significant burden of cor pulmonale is consistent with previous studies in Ethiopia and other African countries [33,34,35]. Ischemic heart disease (IHD) constituted about 14% of the cardiac admission as well as the underlying etiology for advanced heart failure. Most patients with IHD (90%) had hypertension and 42.5% had diabetes mellitus. Consistent with the shifting trend of CVD, there is a progressively increasing trend of IHD over the last few decades. IHD was rare among cardiac patients in the 1960s[11], then increased to 5 to 6% in the early 1990s[13], and increased to reach the current burden of 14% among cardiac patients.

The study revealed that close to 85% of cardiac admissions had at least two weeks of hospital stay with the mean duration of hospital stay being 18.33 days and a median of 15 days (IQR=10-24).

This finding is consistent with similar studies in Ethiopia [25,29,36] but much higher than the median length of 7 days in Cameroon [23] and, the mean hospital stay length of 6.4days, and the median length of 4.0 days (IQR of 3.0- 7.0) in the US[37], probably due to better follow up, drug adherence, risk management, and disease control in the latter settings. The discharge rate was 75% with an in-hospital mortality rate was 23.8% which is in tandem with other studies in Ethiopia and Africa [22, 23, 29] and much lower than the 32% mortality rate in Southeast Nigeria [25]. However, the current in-hospital mortality rate is much higher than 15% among cardiovascular admissions in Cameroon [26], 12.2% among cardiovascular admissions in Nigeria [24], and 4% among HF patients in the US [37]. This could be explained by better medical follow-up, early presentation of patients to hospitals, and better medical care provision in the latter regions with better health systems. This assertion is supported by studies where a health system with a higher quality of care can provide patients with the necessary care and have a better likelihood of desired health outcomes of conditions they were being admitted for [38]. Furthermore, the combined non-cardiac immediate causes of death constituted 44.5% whereas septic shock of chest focus with multi-organ failure accounted for 27.8% which is consistent with a number of studies among cardiac admissions [37,39].

Conclusion

In conclusion, this study has shown that cardiac diseases contributed markedly to medical admissions, with hypertensive heart disease replacing rheumatic heart disease which had been at the top among the spectrum of cardiac diseases in the region for decades. Hypertension was an important risk factor and its control among the cardiac admission was distressingly low. Similarly, in-hospital mortality among cardiac admissions also contributed significantly to the high hospital mortality rate among medical admissions with non-cardiac immediate causes of death being rampant with infectious causes taking a lion's share. Therefore, early risk assessment and its management, adequate cardiac disease control including drug adherence, and stringent inpatient care should be among the priorities to reduce cardiovascular morbidity and mortality.

Abbreviations

NCD-Non-communicable Diseases, CVD-cardiovascular diseases, CHF-Congestive Heart Failure, NYHA-New York Heart Association, HHD-Hypertensive Heart Disease, CRVHD-Chronic Valvular Heart Disease, IHD-Ischemic Heart Disease, DCMP-Dilated Cardiomyopathy, ICD-International Classification of Diseases, CKD-Chronic Kidney Disease, COPD-Chronic Obstructive Lung Disease, SBE-Subacute Bacterial Endocarditis, MS-Mitral Stenosis, MR-Mitral Regurgitation, AR-Aortic Regurgitation, CAP-Community Acquired Pneumonia, ACS-Acute Coronary Syndrome.

Data Sharing Statement

The data sets used and/or analyzed during the current study are available from the corresponding author upon reasonable request.

Author's Contribution

The author was responsible for the conception and design, acquisition of data, or analysis and interpretation of data and write-up.

Funding: There was limited funding from St. Paul Specialized Hospital Millennium Medical College. The Hospital has no role in designing, conducting, and reporting the study.

Disclosure: The author declared that there is no conflict of interest in this work.

Acknowledgment

The author acknowledges St Paul Hospital Millennium Medical College for the provision of some financial support. The author is also grateful to all data collectors for their scientific contribution and to data clerks for their support to access the patient charts.

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