# A DESCRIPTIVE CROSS SECTIONAL STUDY ON CLINICAL PROFILE OF PATIENTS WITH CARDIOVASCULAR DISEASE ADMITTED AT TERTIARY CARE CENTER OF NEPAL

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## ABSTRACT

### INTRODUCTION

Cardiovascular diseases are major causes of morbidity and mortality in many parts of the world. This cross-sectional study was conducted to study the profile and pattern of cardiac diseases in Madhesh Pradesh.

### MATERIAL AND METHODS

It was a descriptive, cross-sectional study conducted in 349 patients in the cardiology department of National Medical College, Birgunj. Demographic data from each patient was entered in a preformed sheet. The pattern of cardiac diseases was recorded at the time of discharge from the hospital as classified according to ICD 10. Patients' outcome were recorded in terms of mortality, discharge to ward, and leave against medical advice. The descriptive data are presented as the number and percentage for categorical data and mean ± standard deviation for continuous data according to their distribution. The Chi-square test and Fisher's exact probability test were used to detect the difference between groups as appropriate.

### RESULTS

Three hundred forty-nine patients were included in this study. Two hundred fourteen (61.3%) were males and 135 (38.7%) were females. Most of the patients (49%) were from older age group >60 years and most common comorbidity was hypertension (25.5%). Forty three percent, 19.5%, 12%, 12.8%, 8.6%, 5.15%, 3.4% and 2.5% had Ischemic heart disease, cardiomyopathy, arrhythmias, hypertension, heart failure, valvular heart disease, congenital heart disease, rheumatic heart disease respectively. The association between different pattern of cardiovascular disease with age and gender was statistically significant ($p < 0.001$) except for heart failure ($p = 0.05$) with age, arrythmia and RHD ($p = 0.504$ and 0.085 respectively) for gender. Outcome in all diseases were statistically significant ($p< 0.001$).

### CONCLUSION

This study shows that ischemic heart disease, cardiomyopathy, arrhythmia, and hypertension were the most common heart diseases in this study.

### KEYWORDS

Cardiology, Cardiomyopathies, Coronary Artery Disease, Developing countries

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https://doi.org/10.3126/jucms.v13i03.88827

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## INTRODUCTION

Cardiovascular diseases are major causes of morbidity and mortality in most parts of the world.[1] The incidence of cardiovascular diseases (CVDs) is twice as high in low and middle-income countries than in high-income countries. CVDs accounting for deaths is 43% in low-income countries, 41% in middle-income countries and 23% in high-income countries respectively.[2]

The pattern and epidemiology of cardiac diseases vary between countries and regions of the same country. There are very few studies on the pattern of cardiac diseases in Nepal. Sharma et al [3] conducted a retrospective study which showed that ischemic heart disease was the most common cardiac disease in Gandaki province. Therefore, this cross-sectional study was conducted in the background of paucity of research on clinical profile and pattern of cardiac diseases and pattern of cardiac diseases in Madhesh Pradesh to fulfill this gap of research data.

## MATERIAL AND METHODS

It was a cross-sectional observational study at the cardiology department of the National Medical College and Teaching Hospital between October 1, 2024 to March 31,2025. The ethical approval from the Institutional Review Committee was obtained (F-NMC/701/080-081) before enrolment in this study. Written informed consent was obtained from the patients or surrogate decision-makers.

Patients ≥18 years admitted to the cardiology department of National Medical College having cardiac diseases according to the International Classification of Diseases (ICD-10) were included in this study. Patients who were younger than 18 years, surrogate decision-makers (a person authorized to make medical decision on behalf of a patient), patient who did not give written informed consent and those who did not have cardiac diseases were not included in this study.

The following information was collected from each patient meeting inclusion criteria on the day of enrollment. Age, sex, ethnicity, occupation, education, diagnosis, and other information including co-morbidity, use of inotropes, length of stay, and use of mechanical ventilation were recorded.

The outcome of the patient was defined as leave against medical advice, death, and discharge. At the time of discharge from the hospital duration of mechanical ventilation, and length of stay in the hospital were recorded.

The convenient sampling method was used in this study. The sample size calculated was 349 using the formula $n= Z^2*pq/e^2$ where, n= the minimum required sample size, Z= 1.96 at a 95% Confidence interval (CI), p= prevalence from a previous study, q= 1-p and e= margin of error (5%).

Bias was reduced by collecting data from all groups of patients.

Data collection was done in a preformed sheet consisting of all physiologic variables and demographic variables. The data was transferred to the Excel sheet and transferred to SPSS-16. The descriptive data are presented as the number and percentage for categorical data and mean ± standard deviation for continuous data according to their distribution.

The Chi-square test and Fisher's exact probability test were used to detect the difference between groups as appropriate. *P* value of <0.05 was considered statistically significant.

## RESULTS

Three hundred forty-nine patients were included in this study.

**Table 1. Demographic characteristics of the study population**

| Parameters | n (%) |
|---|---|
| **Age (Years)** | |
| 18-35 | 37 (10.6) |
| 36-60 | 141 (40.4) |
| >60 | 171 (49.0) |
| **Sex** | |
| Male | 214 (61.3) |
| Female | 135 (38.7) |
| **Ethnicity** | |
| Hindu | 294 (84.2) |
| Muslim | 55 (15.8) |
| **Occupation** | |
| Farmer | 195 (55.9) |
| Housewife | 95 (27.2) |
| Businessman | 36 (10.3) |
| Driver | 9 (2.6) |
| Engineer | 14 (4.0) |
| **Education** | |
| Bachelor | 30 (8.6) |
| Illiterate | 238 (68.2) |
| Primary Level | 31 (8.9) |
| SLC | 50 (14.3) |

Table 1 shows the socio demographics characteristics of the study population. Patients aged >60 year were admitted more than younger and middle age patients. As per data shows 214 (61.3%) were males and 135 (38.7%) were females. Most of the patients in this study were Hindus and farmers.

**Table 2. Clinical characteristics of the study population**

| Parameters | n (%) |
|---|---|
| **Inotropes** | |
| No | 236 (67.6) |
| Yes | 113 (32.4) |
| **Mechanical Ventilation** | |
| No | 243 (69.6) |
| Yes | 106 (30.4) |
| **Co Morbidity** | |
| Chronic Kidney disease | 32 (9.2) |
| Chronic obstructive airway disease | 58 (16.6) |
| Stroke | 10 (2.9) |
| Diabetes Mellitus | 85 (24.3) |
| Hypertension | 89 (25.5) |
| None | 75 (21.5) |
| **Length of stay , days** | |
| <2 | 10 (2.9) |
| >2 | 339 (97.1) |
| **Diagnosis** | |
| Ischemic Heart Disease | 150 (43) |
| Cardiomyopathy | 68 (19.5) |
| Arrhythmia | 45 (12.9) |
| Hypertension | 44 (12.8) |
| Heart failure | 30 (8.6) |
| Congenital Heart Disease | 12 (3.4) |
| Valvular Heart Disease | 18 (5.15) |
| Rheumatic Heart Disease | 09 (2.57) |

Table 2 shows the pattern of cardiovascular diseases among the patients. Most of the patients were not on inotropes (n=236, 67.6%) and mechanical ventilation (n=243, 69.6%). Most of the patients had Diabetes mellitus (n=85, 24.3%) and hypertension (n=89, 25.5%) as comorbidity. Among the total population majority of the patients were diagnosed with Ischemic Heart Disease (n=150, 43%) and cardiomyopathy (n=68, 19.5%).

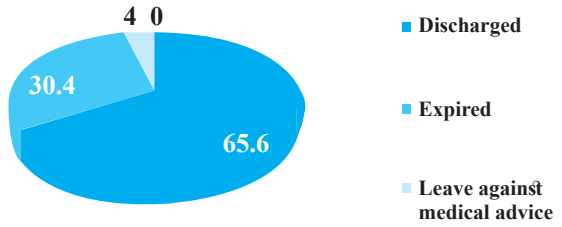


**Figure 1. Outcome of the patients admitted with cardiac disease**

Figure 1 shows the outcome of patients from the hospital that was admitted with cardiac disease. Our study showed that 229 (65.6%) patients survived and went home, 106 (30.4%) expired, 14 (4%) left the hospital against medical advice (LAMA).

Out of 349 patients 113 (32.4%) were on inotropes and 106 (30.4%) required mechanical ventilation.

**Table 3. Association between pattern of cardiovascular disease with patient different age with chi-square and Fischer exact test**

| Diagnosis | Age groups | | | | | | |
|---|---|---|---|---|---|---|---|
| | >60 [n=171] | % | 18-35 [n=37] | % | 36-60 [n=141] | % | p |
| Arrhythmia | 12 | 7.0 | 6 | 16.2 | 26 | 18.4 | 0.008 |
| Cardiomyopathy | 50 | 29.2 | 0 | 0.0 | 16 | 11.3 | <0.001 |
| CHD(ASD) | 0 | 0.0 | 8 | 21.6 | 0 | 0.0 | <0.001 |
| Heart Failure | 21 | 12.3 | 0 | 0.0 | 13 | 9.2 | 0.05 |
| Hypertension | 19 | 11.1 | 6 | 16.2 | 0 | 0.0 | <0.001 |
| IHD | 77 | 45.0 | 17 | 45.9 | 61 | 43.3 | 0.934 |
| RHD | 1 | 0.6 | 0 | 0.0 | 8 | 5.7 | 0.019 |
| VHD | 1 | 0.6 | 0 | 0.0 | 17 | 12.1 | <0.001 |

Disease; VHD: Valvular Heart Disease

Table 3 shows significant different in all diagnosis except heart failure associated with patient different age.

**Table 4. Association between pattern of cardiovascular disease with sex of patient with chi-square and Fischer exact test**

| Diagnosis | SEX | | | | |
|---|---|---|---|---|---|
| | F[n=135] | % | M[n=214] | % | p |
| Arrhythmia | 15 | 11.1 | 29 | 13.6 | 0.504 |
| Cardiomyopathy | 16 | 11.9 | 50 | 23.4 | 0.007 |
| CHD(ASD) | 8 | 5.9 | 0 | 0.0 | <0.001 |
| Heart Failure | 4 | 3.0 | 30 | 14.0 | 0.001 |
| Hypertension | 0 | 0.0 | 25 | 11.7 | <0.001 |
| IHD | 77 | 57.0 | 78 | 36.4 | <0.001 |
| RHD | 1 | 0.7 | 8 | 3.7 | 0.085 |
| VHD | 14 | 10.4 | 4 | 1.9 | <0.001 |

ASD: Atrial Septal Defect; CHD: Congenital Heart Disease; IHD: Ischemic Heart Disease; RHD: Rheumatic Heart Disease; VHD: Valvular Heart Disesase

Table 4 shows significant different in all diagnosis except arrhythmia and RHD associated with sex.

**Table 5. Association between pattern of cardiovascular disease and outcome with chi-square and Fischer exact test**

| Diagnosis | Outcome | | | | | | |
|---|---|---|---|---|---|---|---|
| Diagnosis | Discharge[n=229] | % | Expired[n=106] | % | LAMA[n=14] | % | |
| Arrhythmia | 44 | 19.2 | 0 | 0.0 | 0 | 0 | <0.001* |
| Cardiomyopathy | 26 | 11.4 | 40 | 37.7 | 0 | 0 | <0.001* |
| CHD(ASD) | 0 | 0.0 | 8 | 7.5 | 0 | 0 | <0.001* |
| Heart Failure | 4 | 1.7 | 23 | 21.7 | 7 | 50 | <0.001* |
| Hypertension | 25 | 10.9 | 0 | 0.0 | 0 | 0 | <0.001* |
| IHD | 120 | 52.4 | 35 | 33.0 | 0 | 0 | <0.001* |
| RHD | 0 | 0.0 | 9 | 8.5 | 0 | 0 | <0.001* |
| VHD | 10 | 4.4 | 1 | 5.6 | 7 | 50 | <0.001* |

ASD: Atrial Septal Defect; CHD: Congenital Heart Disease; IHD: Ischemic Heart Disease; LAMA: Leave Against Medical Advice; RHD: Rheumatic Heart Disease; VHD: Valvular Heart Disease

Table 5 shows association of outcome with different cardiac disease which were significantly different in outcome in all diagnosis.

## DISCUSSION

Cardiovascular diseases are misdiagnosed and under-reported but are common in developing countries like Nepal. Patterns of cardiac diseases should be known early helps in planning preventive and therapeutic measures.[3]

Older aged and male patients were common in our study which is similar to other studies.[1-8] Hypertension was the most common comorbidity in our study which is similar to other studies.[6-9] Ischemic heart disease was present in 43% of patients in our study while in a study by Sharma D et al[3] and Limbu YR et al,[5] it was 35% and 15.12% respectively. Rheumatic heart disease (RHD) was present in 2.57% in our study while in a study by Sharma D et al[3] and Limbu YR et al[6] it was 15.2% and 30.67% respectively. This difference may be due to changes in the pattern of diseases in recent years, and increase in awareness of RHD among the general population and the pattern may vary on centre where the study was conducted.

This study has shown that 65.6% of patients were discharged, 30.4% expired, and 4% patients underwent leave against medical advice while in a study by Sharma D et al[3] it was 97.6%, 1.2% and 0.5% respectively. This difference may be due to delayed presentation of patients to our center, a decrease in awareness about cardiac diseases in Madhesh Pradesh, and delay in cardiac interventions by cardiologists due to financial problems of patients.

This study has shown that older age (>60 years) was statistically significant in patients having cardiomyopathy, heart failure, and hypertension which is similar to other studies.[1-10] Other studies have shown that ischemic heart disease (IHD) was common in older age but in our study, it

was not statistically significant. This difference may be due to the small sample size.

Arrhythmias, valvular heart disease (VHD), and RHD were significantly common in middle age group in our study and was consistent with those of other studies.[2-11] As reported by other studies[1-12] Cardiomyopathy, IHD, heart failure, and hypertension were found to be more common in male whereas Congenital Heart Disease and VHD were common in females in our study. RHD was statistically significant in males in our study while other studies [1-9] have shown that it was more common in females. This difference may be due to the small number of patients having RHD in our study.

This study has shown that mortality was statistically significant in patients having cardiomyopathy, RHD, heart failure, and congenital heart disease which is similar to other studies.[1-9]

Patients having IHD, arrhythmias, and VHD were discharged which was statistically significant in our study, similar to other studies.[1,2,9,12] This study has limitations it was a single-center study and long term outcomes of cardiac diseases were not recorded.

## CONCLUSION

Most of the patients were male, from older age group (>60 years) and hypertension was the most common comorbidity. Ischemic heart disease, cardiomyopathy, arrhythmia, and hypertension were the most common heart diseases and outcome was poor in heart failure patients.

## CONFLICT OF INTEREST

None

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