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Prevalence and Patterns of Arrhythmias in ICU of a Tertiary Care Center in Nepal

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ABSTRACT

Background: Cardiac rhythm disorders, including atrial fibrillation (AF), supraventricular tachycardia (SVT), ventricular tachycardia (VT), and heart block, are common cardiovascular conditions associated with increased morbidity and mortality, particularly in elderly populations. Understanding the prevalence and clinical patterns of these disorders is essential for early diagnosis and effective management. The objective of this study is to determine the prevalence and patterns of cardiac rhythm disorders among patients attending a tertiary care center in Nepal.

Methods: A descriptive observational study was conducted in ICU at Chitwan Mutu Hospital over a period of one year. A total of 110 patients with documented arrhythmias or conduction abnormalities on electrocardiogram (ECG) were included. Demographic data, type of arrhythmia, and presence of heart block were recorded using a pre-structured data collection sheet. Data were analyzed using SPSS version 17 and descriptive statistics such as frequencies and percentages were calculated.

Results: The study population consisted predominantly of elderly patients, with 29.09% aged 71–80 years and 23.64% aged 61–70 years. The sex distribution was nearly equal (53.64% males, 55.45% females). AF with fast ventricular response (FVR) was the most common arrhythmia (50.91%), followed by paroxysmal supraventricular tachycardia (PSVT, 21.82%). VT and ventricular premature complexes (VPCs) were observed in 2.73% each. Among heart block disorders, third-degree or complete heart block (CHB) was present in 7.27% and second-degree block in 2.73%. Wolff–Parkinson–White (WPW) syndrome was noted in 5.45%, and sinus node dysfunction in 3.64%.

Conclusion: Cardiac rhythm disorders, particularly AF with FVR, are more prevalent in older adults. Early detection and appropriate management are critical to reducing complications such as stroke, heart failure, and sudden cardiac death in this population.

Keywords: cardiac arrhythmia; atrial fibrillation; heart block; prevalence; Nepal.

INTRODUCTION

Cardiac rhythm disorders, including atrial fibrillation (AF), supraventricular tachycardia (SVT), ventricular tachycardia (VT), and heart block, are significant contributors to morbidity and mortality worldwide.[1,2] These arrhythmias can lead to complications such as stroke, heart failure, and sudden cardiac death, particularly in the elderly population.[3] The prevalence and patterns of these disorders vary according to age, sex, and underlying comorbidities. Atrial fibrillation, the most common sustained arrhythmia, is strongly associated with advanced age and structural heart disease, while conduction abnormalities like complete heart block and Wolff–Parkinson–White (WPW) syndrome, though less common, can be life-threatening if not promptly diagnosed.[4,5] Understanding the epidemiology and clinical characteristics of cardiac rhythm disorders in a local population is essential for developing targeted prevention, early detection, and management strategies. This study aims to evaluate the prevalence and patterns of cardiac rhythm disorders among

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patients attending a tertiary care center in Nepal.

METHODS

This descriptive observational study was conducted at Chitwan Mutu Hospital, a tertiary care center in Chitwan, Nepal, over a period of one year. Informed written consent was obtained from all participants. Patient confidentiality was strictly maintained throughout the study. The study included patients of all age groups who were diagnosed with cardiac rhythm abnormalities, including atrial fibrillation with fast ventricular response (AF with FVR), paroxysmal supraventricular tachycardia (PSVT), ventricular tachycardia (VT), ventricular premature complexes (VPCs), and various degrees of heart block. Patients with incomplete medical records, transient arrhythmias due to reversible causes, or critically ill individuals unable to provide consent were excluded. Data were collected using a pre-structured data sheet, documenting demographic details such as age and sex, as well as clinical characteristics including type of arrhythmia, heart block classification, and the presence of Wolff–Parkinson–White syndrome or sinus node dysfunction. All electrocardiograms (ECGs) were interpreted by consultant cardiologists according to standard diagnostic criteria, and relevant clinical histories and laboratory findings were reviewed to ensure accurate classification. The collected data were entered into Microsoft Excel and analyzed using SPSS version 17. Descriptive statistics, including frequencies and percentages for categorical variables were calculated.

RESULTS

A total of 110 patients with cardiac rhythm disturbances were included in this study, with ages ranging from 11 to 100 years. The age distribution indicates a clear predominance of elderly patients: 29.09% were aged 71–80 years, 23.64% were 61–70 years, and 13.64% were 51–60 years. Only 11.82% of participants were younger than 40 years, suggesting that arrhythmias, particularly atrial fibrillation and heart block, are more prevalent among older adults. This age-related pattern aligns with known pathophysiological changes in cardiac conduction, myocardial fibrosis, and structural heart disease that occur with aging. The study population had a nearly equal sex distribution, with 53.64% males and 55.45% females, indicating that both genders are similarly affected by cardiac arrhythmias in this cohort. Regarding the types of arrhythmias, atrial fibrillation with fast ventricular response (AF with FVR) was the most frequent, observed in 50.91% of patients, reflecting its well-documented association with advanced age, hypertension, and structural heart disease. Paroxysmal supraventricular tachycardia (PSVT) accounted for 21.82% of cases, whereas ventricular tachycardia (VT) and ventricular premature complexes (VPCs) were relatively rare, each occurring in 2.73% of participants. Heart block disorders were also notable in this cohort. Third-degree or complete heart block (CHB) was identified in 7.27%, and second-degree heart block in 2.73% of

Table 1. Clinicodemographic characteristics of the patients. (n=110)

Characteristics	Frequency (%)
Age	
11-20	2(1.82)
21-30	6(5.45)
31-40	5(4.55)
41-50	9(8.18)
51-60	15(13.64)
61-70	26(23.64)
71-80	32(29.09)
81-90	12(10.91)
91-100	3(2.73)
Sex	
Male	59(53.64)
Female	61(55.45)
AF with FVR	56(50.91)
PSVT	24(21.82)
VT	3(2.73)
VPCs	3(2.73)
Heart block	
1st Degree	
2nd Degree	3(2.73)
3rd Degree/ CHB	8(7.27)
WPW syndrom	6(5.45)
Sinus Node dysfuction	4(3.64)

patients. Wolff–Parkinson–White (WPW) syndrome was present in 5.45%, and sinus node dysfunction in 3.64% of participants. These findings underscore the clinical diversity of conduction abnormalities, ranging from potentially life-threatening AV blocks to accessory pathway-mediated arrhythmias (Table 1).

DISCUSSION

In our study of 110 patients aged 11-100 years at Chitwan Mutu Aspatal, agewise distribution of arrhythmias was 29.09% from 71–80 years, 23.64% from 61–70 years, and 13.64% from 51–60 years. Only 11.82% of participants were younger than 40 years.The study population had a nearly equal sex distribution, with 53.64% males and 55.45% females. Atrial fibrillation with fast ventricular response (AF with FVR) was the most frequent, observed arrhythmia in 50.91% of patients. Paroxysmal supraventricular tachycardia (PSVT) accounted for 21.82% of cases.

A study conducted in COMS-TH, Nepal by Dhungel and Laudari[6] revealed AF as the most common arrhythmia. Out of 205 patients studied over 2013-2016,mean age was 63.95±16.5 years. Total 105 (51.2%) were males and 100 (48.8%) were females. There were 154 (75.1%) nonvalvular and 51 (24.9%) valvular causes for atrial fibrillation. A study at Shahid Gangalal National Heart Centre, Kathmandu included 1,012 consecutive ED patients (Sept-Nov 2014). AF was found in 140 patients (13.8%) with mean age ~ 55 years and female prevalence was higher (19.2% vs 9.4%). Among patients with rheumatic heart disease (RHD), ~70% had AF.[7]

A prospective observational study of 78 symptomatic patients (palpitation, dizziness, presyncope) who underwent 24-h Holter monitoring at B P Koirala Institute of Health Sciences (Dharan) revealed most frequent arrhythmias: ventricular ectopics, then supraventricular ectopics. Among 18 patients with significant bradyarrhythmia: 3 had sinus bradycardia with pause, 3 had AF + pause, 2 had high-grade/ complete AV block.[8] Despite the relatively lower prevalence of AF in people of African descent, the presence of AF is associated with higher rates of strokes, heart failure, and mortality compared to Caucasians, and Black patients with AF are much younger than patients of other races.[9] Atrial fibrillation was seen in 43–82% of patients with cardio-embolic strokes in SSA.[10,11]

In our study, Third-degree or complete heart block (CHB) was identified in 7.27%, and second-degree heart block in 2.73% of patients. Wolff–Parkinson–White (WPW) syndrome was present in 5.45%, and sinus node dysfunction in 3.64% of participants. Among 100 patients with acute ischaemic stroke in a tertiary centre in Central Nepal, arrhythmias were found in 56% (n=56). AF incidence was 20%. Other arrhythmias were sinus tachycardia (9%), PVC (8%), VT (5%), sinus bradycardia (4%), etc.[12] In Holter monitoring studies of symptomatic patients, while the bulk of arrhythmias are “benign” (ectopics), there are clinically significant brady- and tachy-arrhythmias.[13,14] Among acute stroke patients, arrhythmias are common (56%), and AF in 20%. There is important overlap between arrhythmias and cerebrovascular disease.[15]

CONCLUSIONS

The study demonstrates that cardiac rhythm disorders are predominantly observed in elderly patients, with the highest prevalence in those aged 61–80 years. Atrial fibrillation with fast ventricular response (AF with FVR) emerged as the most common arrhythmia, followed by paroxysmal supraventricular tachycardia (PSVT), while ventricular tachycardia, VPCs, and conduction abnormalities such as complete heart block, WPW syndrome, and sinus node dysfunction were less frequent. The nearly equal sex distribution suggests that both males and females are similarly affected. These findings highlight the importance of early detection and timely management of cardiac arrhythmias, particularly in older adults, to prevent serious complications such as stroke, heart failure, and sudden cardiac death. The results underscore the need for targeted screening and clinical vigilance in tertiary care settings to improve patient outcomes.

Recommendation

Regular screening and early detection of cardiac rhythm disorders, especially atrial fibrillation, should be prioritized in older adults. Clinicians should maintain high vigilance for conduction abnormalities to prevent complications. Implementation of targeted management strategies in tertiary care centers can improve patient outcomes and reduce morbidity and mortality associated with arrhythmias.

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