



## Pattern of Admissions to Cardiac Care Unit in a Teaching Hospital in Western India

### KEYWORDS

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**ABSTRACT** *Background: Patients presenting with cardiac emergencies to hospitals are admitted to the Cardiac Care Unit. In India, there has been an increase in patients with cardiac diseases and cardiac emergencies in particular. The purpose of this study is to assess the pattern and causes of cardiac emergencies admitted to Cardiac Care Unit in a teaching hospital in western India.*

*Material and Methods: A retrospective cross sectional study was undertaken. Hospital records of all patients admitted to the Cardiac Care Unit from June 2014 to August 2014 were reviewed. Relevant epidemiological and other data was extracted from these files.*

*Results: Around 1.2 % of the total admissions to the hospital from the emergency department were admitted to the Cardiac Care Unit. The mean age of the patients was 57.9 years. Males were affected thrice as commonly as females. Majority of patients presented with acute coronary syndrome, followed by hypertensive emergency and congestive cardiac failure or pulmonary edema. Few patients were admitted with arrhythmias, and rheumatic valvular heart disease. 3% patients died during their stay in the Cardiac Care Unit.*

*Conclusion: Cardiac emergencies are seen in a slightly younger age group. Efforts should be directed towards risk factors of heart disease to combat and reduce cardiac emergencies.*

**Introduction:** The incidence of cardiac disease is on the rise worldwide. It contributes significantly to mortality, all over the world. In the developing world, till the early 20<sup>th</sup> century, it was the cause of death in 10% of patients. This rose to over 25% till the end of the 20<sup>th</sup> century. At that time it contributed to over 45% of deaths in the developed world.<sup>1,2</sup> In India, cardiovascular diseases accounted for around one fourth of all deaths, in 2008.<sup>3</sup> There is an increase in the emergency hospital admissions due to cardiac causes in different parts of the world.<sup>4,5,6,7</sup> Also, like in other countries in the developing world, there is a rise in the burden of non-communicable diseases in India. Both these factors lead to an increase in the number of patients admitted to the cardiac care unit (CCU). Cardiac care units themselves are undergoing transition, wherein they are changing from being intensive coronary care units to being acute cardiac care units.<sup>8</sup>

There is a lack of data about the types of cardiac emergencies presenting to CCU in large teaching hospitals in India. We intend to study the epidemiology and causes of cardiac emergencies among patients admitted to the CCU of our hospital.

**Material and Methods:** This is a single centre, retrospective, cross sectional study carried out at a 750 bedded teaching hospital in western India. The CCU record book was searched for all admitted patients from June 1, 2014 to August 31, 2014. The hospital records of these patients were studied for epidemiological data (age, gender), cause of hospitalization, duration of CCU stay and outcome.

**Results:** Throughout the study period, 125 patients with cardiac emergencies were admitted to the CCU, and were 1.2% of all patients admitted to the hospital from the emergency department. The mean age of these patients was 57.9 years, ranging from 12 to 95 years. The major-

ity of the patients were in the 51-70 years age-group. 72% were males and 28% were females. The most common cause of hospitalization to the CCU was acute coronary syndrome (34.4%), comprising of ST-elevation myocardial infarction (STEMI) (5.6% of all cardiac emergencies), and non ST- elevation myocardial infarction/ unstable angina (NSTEMI/ UA) (28.8% of all cardiac emergencies). The other common causes of cardiac emergencies were hypertensive emergency (28%), congestive cardiac failure or pulmonary edema (16.8%), arrhythmias (9.6%), and rheumatic valvular heart disease (RVHD) (6.4%). The mortality rate was 3% of all patients admitted with cardiac emergencies.

**Discussion:** Depending on the country, cardiac cases presenting to the CCU varies with respect to clinical presentation and demographics.

The mean age of our study population was 57.9 years which is similar to other studies from the Indian subcontinent, but less than that observed in data from western (America, Europe) and other sources (Japan).<sup>1,9-15</sup> The lower mean age may be due to earlier onset of ischemic heart disease and hypertension in people of Asian lineage and also due to the substantial number of patients with RVHD, which usually presents at a younger age.<sup>4</sup> The reasons for presentation of coronary heart disease at a younger age in Indian population are i) increased frequency of risk factors (diabetes mellitus, smoking, central obesity, dyslipidemia), ii) lack of awareness of disease, risk factors and treatment.

Almost 3/4<sup>th</sup> of the patients admitted with cardiac emergencies were males, which is in concordance with most studies.<sup>4,6,9-15</sup> This may be due to the fact that fewer females visit health care facilities for treatment due to lack of educational awareness and for socio-economic reasons.

The proportion of cardiac emergencies in our hospi-

tal is 1.2% of all emergency admissions. In a study from the United States, cardiac emergencies constituted 23.2 per 1000 emergency admissions in the state of Utah over a two year period.<sup>16</sup> It may not be possible to compare these rates as our study population may not have represented the actual prevalence of cardiac emergencies in the general population. In the study from Bangladesh, cardiac emergencies constituted 4.5% of the total emergency admissions in a general hospital, which is nearer to our finding.<sup>4</sup>

Acute coronary syndrome constituted nearly one third of all admissions to the CCU. This is in concordance with the study from United States, but discordant with other studies from Bangladesh, Greece and Norway where almost two third of the patients had acute coronary syndrome.<sup>4,6</sup> STEMI constituted 5.6% of all cardiac emergencies and they were all thrombolysed with streptokinase. The patients who were unstable hemodynamically or those who had persistent chest pain after being thrombolysed were referred to a percutaneous coronary intervention enabled centre (pharmaco-invasive approach). The second common cardiac emergency was hypertensive emergency/severe hypertension. Hypertensive emergencies were the most common cardiac emergency in the Nigerian study.<sup>7</sup> Increasing awareness and adequate and appropriate treatment will prevent increase in this type of cardiac emergency. Decompensated heart failure and cardiogenic pulmonary edema constituted about 17% of cardiac emergencies. Dilated and ischemic cardiomyopathy was the commonest cause. Heart failure was the commonest cause of cardiac emergency in America.<sup>6</sup> There were few cases of RVHD reflecting the decrease in recent years in rheumatic fever and concomitant valvular heart diseases.

The in-hospital cardiac mortality was 3% and it reflects the decreasing mortality rate amongst cardiac patients being treated in a tertiary care hospital. Mortality rate ranged from 4.2% to 13.5% in studies around the world.<sup>4-6</sup> Our mortality rate may be low because patients requiring percutaneous coronary/valvular interventions or cardiovascular surgery or even invasive hemodynamic support (intra-aortic balloon pump) were referred to cardiac centers.

There are certain limitations to our study. It is a single centre, retrospective study and our results may not be extrapolated to the entire Indian population. Also as our hospital is a general hospital without dedicated cardiologist or coronary intervention facilities, the results may not match dedicated cardiac centers.

**Conclusion:** Acute coronary syndrome was the principle cause of cardiac emergency. Ischemic heart disease and hypertension comprise major proportion of patients with cardiac emergencies. Awareness and management of risk factors of ischemic heart disease and hypertension and improvement in emergency care is essential to reduce the burden of cardiac emergencies.

**Table 1 Age group distribution of patients**

Age (years)	Number of patients (%)
0-10	0 (0%)
11-20	3 (2.4%)
21-30	9 (7.2%)
31-40	21 (16.8%)
41-50	12 (9.6%)
51-60	25 (20%)
61-70	35 (28%)
71-80	17 (13.6%)
81-90	3 (2.4%)

**Table 2 Gender distribution of patients**

Gender	Number of patients (%)
Male	90 (72%)
Female	35 (28%)

**Table 3 Diagnosis of patients**

Diagnosis	Number of patients (%)
Acute coronary syndrome	43 (34.4)
STEMI	7 (5.6%)
NSTEMI	36 (28.8)
Arrhythmias	12 (9.6%)
Heart failure	21 (16.8)
Hypertensive emergency/ severe hypertension	35 (28%)
RVHD	8 (6.4)
Pericardial diseases	2 (1.6)
Pulmonary embolism	4 (3.2)

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