Original Article

Prevalence and Pattern of Cardiac Emergencies In a Tertiary Care Hospital of Bangladesh

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Abstract:

Objective: *Worldwide cardiac cases constitute a large portion of the medical emergencies. There is a paucity of data on the prevalence of cardiac emergencies in Bangladesh. The purpose of this study was to identify the pattern of presentation of cardiac emergencies in a tertiary care hospital in Bangladesh.*

Methods and Materials: *A hospital based cross sectional study was carried out at a medical college hospital in Dhaka city. Hospital medical records of **2457** patients admitted in the Coronary Care Unit (CCU) between **1 July 2011 to 30 June 2012** were reviewed. Relevant socio demographic data were abstracted from the hospital record files.*

Result*: About **4.5%** of the total emergency hospital admission was on the CCU. The mean age of the admitted pateints was **55.5 (SD 9.56)** years. Males were affected twice as females. Majority of the patients presented with **Acute Myocardial Infarction (AMI) (42%)**, followed by **Acute Left Ventricular Failure** (19%) and **Unstable Angina** (16%). Small portion of the patients admitted with Cardiogenic Shock, Valvular heart Disease, Congestive Cardiac Failure and Variable Block. **Hypertension** (26%) and **Diabetes Melitus** (15%) was the two most common co-existing pathologies, along with Stroke, Respiratory Disease and Renal Disease. **13.5%** patients died during their hospital stay.*

Conclusion: *MI as the principal cause of cardiac emergencies is in coherence with other studies done abroad. High prevalence of Hypertention and Ischemic Heart Disease points to the dietery and lifestyle pattern of the people. Improvement of emergency care along with lifestyle modification is essential to minimize the burden of cardiac emergencies in Bangladesh.*

Key Word: *cardiac emergencies, Bangladesh, tertiary care hospital, coronary care unit.*

Introduction:

Cardiac emergency is defined as a situation in which, owing to involvement of the heart, health is endangered so that immediate action is needed ; thus a cardiac emergency is usually sudden, commonly unexpected, and always requires urgent action.[1] Globally cardiac cases constitute a large portion of the medical emergency cases with a small variation in prevalence from region to region.[2] Majority of the medical causes of 911 (emergency) calls in

USA are for cardiovascular emergency and in some towns of Russia, 45% of all the medical emergency calls were for cardiovascular emergency.[1] An estimated 83.6 million American adults (>1 in 3) have one

or more types of cardiovascular disease. Among the cardiac cases in USA, Myocardial Infarction (MI) have the highest prevalence, followed by Angina and Heart Failure. CHD caused H"1 of every 6 deaths in the United States in 2009.[3] In India CVDs accounted for

around one-fourth of all deaths in 2008.[4] Major co-existing pathologies in CVD are hyperlipidemia, followed by Hypertension, Obesity and Diabetis Mellitus.[5]

Like the other part of the world, Bangladesh is passing through an epidemiological tnansition. Burden of infectious diseases are coming down and due to wide spread change of lifestyle, non-communicable diseases are on the rise.[6] There is an ever increasing number of emergency hospital admissions due to cardiac causes in different hospitals of Bangladesh.[7] However, there is lack of data on prevalence and presentation of cardiac emergency cases in Bangladesh. It is important to identify the pattern of cardiac emergencies

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and co-morbid factors to determine strategy for effective emergency care for the population. In this study we sought to determine the prevalence and presentation of cardiac emergency cases along with associated pathologies among patients admitted into Dhaka Medical College Hospital (DMCH).

Materials and Method:

This was a single centre cross sectional study carried out at Dhaka Medical College Hospital (DMCH), a tertiary teaching hospital in Dhaka, Bangladesh. This centre receives patients from all over the country and serves as a referral centre for patients requiring tertiary care. The hospital emergency admission record book from July 2011 to June 2012 was searched to identify the number of patients admitted into the Coronary Care Unit (CCU). The admission record books of both the doctors and the nurses in CCU were checked and the diagnosis were noted and categorised. Variables recorded includes age, sex, history of Diabetes Mellitus (DM)(fasting plasma glucose > 7.0 mmol/l or on treatment), hypertension (blood pressure >140/90mmHg or on treatment), hyperlipidemia (fasting cholesterol >200mg/dl or on treatment). Death records were noted. Exclusion criteria were patients transfered in from different indoor wards into the CCU, thus not admitted through emergency department. Data were checked for accuracy and consistency.

Results:

Among 58139 patients admitted through emergency department throughout this 1 year period, 2457 patients were found to be admitted in the Coronary Care Unit (CCU) i.e. 4.5% of totally admitted patients had cardiac emergency. The mean age of this 2457 patients were 55.5 (+9.56) years ranging from 1 to 95 years. The majority of the patient population was in the age group of 50-59 years (31%) (Table 1). 68% (1671) of the cases were male and 32% (786) were female.

Table-I

Age Group	Percentage of Patients
< 30 years	2%
30-39 years	6%
40-49 years	19%
50-59 years	31%
60-69 years	23%
70-79 years	12%
> 80 years	7%

The most common cause for admission in the CCU was Acute Myocardial Infarction (AMI) with a percentage of 42 (1039) (Table 2), of which 92% were ST elevated MI and 8% were Non ST Elevated MI. The second most common cause was Acute Left Ventricular Failure (ALVF) (19%), followed by Unstable Angina UA (16%). Cardiogenic Shock was in the next position (6.5%), followed by Valvular

Heart Disease (5%), Congestive Cardiac Failure (CCF) (5%), Variable Block (2.5%), Cardiomyopathy (1.5%) and Congenital Heart Disease (.8%). There were few cases of Anemic Heart Failure, Atrial Fibrilation, Iatrogenic Heart Failure,Poisoning, Sick Sinus Syndrome, Takayasu Arteritis and WPW Syndrome.

Table-II

Diagnosis	Number of Patients
Acute Myocardial Infarction	1039 (42%)
Acute Left Ventricular Failure	463 (19%)
Unstable Angina	396 (16%)
Cardiogenic Shock	157 (6.5%)
Valvular Heart Disease	125 (5%)
Congestive Cardiac Failure	122 (5%)
Variable Blocks	61 (2.5%)
Cardiomyopathy	36 (1.5%)
Congenital Heart Disease	19 (.8%)
Atrial Fibrilation	13 (.5%)
Anemic Heart Failure	8 (.3%)
Post PTCA complication	5 (.2%)
Sick Sinus Syndrome	3
Iatrogenic Heart Failure	3
Poisoning	3
Takayasu Arteritis	2
WPW Syndrome	2

Hypertension (26%) and Diabetes Mellitus (15%) were the two most common co-existing pathologies (Table 3). 11.5% (283) patients had an history of old MI. Respiratory Disease (COPD/Bronchial Asthma) (8.3%), Stroke (8%), Chronic Kidney Disease (CKD) (5%) and Hyperlipidemia (2%) were the other co-morbid factors. Very few patients had electrolyte imbalance, trauma and Chronic Liver Disease (CLD). There were 19 female patients presented with Peripartum Cardiomyopathy. 332 (13.5%) patients died during their hospital stay from various complications.

Table-III

Co-morbidity	Percentage of Patients
Hypertension	26%
Diabetes Mellitus	15%
Old MI	11.5%
Respiratory Disease (COPD/Br. Asthma)	8.3%
Stroke	8%
Chronic Kidney Disease	5%
Hyperlipidemia	2%
Others(Electrolyte Imbalance,CLD,Trauma)	4%

Discussion:

The clinical and demogarphic presentation of cardiac cases in emergency department may vary from country to country. The mean age of our study population was 55.5 years, which is relatively lower than that observed in different studies done abroad.[2-12]

According to the 2012 chartbook on cardiovascular, lung and blood diseases, heart disease was the leading cause of death for those aged 65 years and older[13]. The possible reasons for premature onset of Coronary Heart Disease in our country may be lack of awareness of morbid risk factors and appropriate treatment. It was also found that most of the Heart Failure cases presented over the age of 50 years, whereas Acute Coronary Syndrome (ACS-Myocardial Infarction and Unstable Angina) was quite frequent before the age of 50 years. Natural history of disease may play a role for this. We also found that almost two thirds of the patients were male and one third were female, which is in coherence with most of the studies.[2-12] This may also attributed to the fact that less female patients come to hospital for treatment for various socio-economic factors.[14]

In our study, the prevalence of cardiac emergency patient in DMCH was about 4.5% of the total emergency admission. In a study in Utah, USA, the statewide age-adjusted rate for emergency department encounters for CHD was 23.2 per 1000 during the year 2007-2009.[15] As DMCH is a general hospital, the prevalence may not necessarily represent the actual prevalence of cardiac emergencies in general population. ACS (MI and UA jointly combined) constituted about 58% of the cardiac emergency cases, which is quite similar with the other studies.[16] According to Heart Disease and Stroke statistics 2013 update, CHD makes up more than half of all cardiovascular events in men and women <75 years of age in USA.[3] MI as the leading cardiac emergency is in coherence with other studies. Heart Failure (ALVF+CCF) was the second leading cardiac emergency constituting about 24% of all cases, followed by Cardiogenic Shock and Valvular Heart Disease. This findings are also more or less similar with other studies.[7]

Co-morbid medical conditions were prevalent in this cohort, with 60% patients having atleast one co-morbid condition. Hypertension, with a percentage of 26, was the most common co-morbid condition. The World Health Report 2002 estimates that over 50% of CHD in developed countries is due to systolic blood pressure levels in excess of 115 mmHg.[17] Almost 40% of patients with ischemic heart disease who die suddenly have a history of hypertension.[18] Although the percentage in this study does not reflect the prevalence of Hypertansion in our country, it fairly co-incide with the relation between Hypertension and CHD. Diabetes was also a major associated pathology in cardiac emergencies. FHS/NHLBI data show that having DM significantly increased the risk of developing CVD.[10] One significant dissimilarity with the other studies is the lower prevalence of Hyperlipidemia(2%) among the cardiac patients. The prevalence of total cholesterol (in adults age 20 and older) at or above 200 mg/dl in USA was 106,700,000, which represents about 48% of the adult population.[5] One possible reason is the lack of investigation of lipid profile. Lipid profile should be routinely screened in patients over the age of 40 years. We have found 11.5% patient with a history of old MI. According to the Framingham study, A second Myocardial Infarction occurred in 13% of the men and in 40% of the women within 5 years of the first infarction.[19] The presence of other emergency conditions is also notable. The death rate in CCU was 13.5% . The overall death rate from CHD in USA in 2009 was about 17%.[3]

We certainly had some limitations in this study that warrent consideration. This was a single centre retrospective study and our result may not be extrapolated to the entire Bangladeshi population. Also as DMCH is a genaral hospital, our findings may vary from the specialized cardiac hospitals. Despite these limitations we tried to identify the presenting cardiac problems in the emergency department that demands appropriate managment for a better funtional outcome in the long run.

Conclusion:

Cardiac emergencies are important part of critical care services. Coronary Heart Disease and Heart Failure are the predominant causes. Critical care services should be well equiped to manage these cases. High prevalence of co-morbidities indicate the sedentary lifestyle and unhealthy dietery pattern of the people. Lipid profile should be routinely done in high risk patients. Awareness of both physicians and public about cardiovascular diseases along with improvement of cardiac critical care could elevate the health condition and quality of life of the people. Further clinical and epidemiological studies should be carried out to determine the burden of cardiac emergecies in Bangladesh.

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