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Prevalence of Cardiovascular Diseases and Prescription Patterns in a Randomly Selected Population in Bangladesh

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ABSTRACT

The basis for assessment of cardiovascular disease management is reliable on the demographic study of cardiovascular diseases (CVDs) and drug usage in a population. The aim of this study was not only to observe the prevalence of CVD in a population and the trend of drugs prescribed but to also identify the most prominent CVDs, the reasons behind their occurrence, types of treatment for all kinds of CVDs reported and the reason for choosing the particular drug singly or in a combination with other therapeutic classes. This descriptive study was carried out for a period of three months from July 2016 to the end of September 2016 among 853 patients, of which 427 patients visited National Institute of Cardiovascular Diseases (NICVD) while the other 426 visited the National Heart Foundation Hospital in Dhaka, Bangladesh. The patients were questioned with a self-developed questionnaire and their prescriptions were analysed to comprehend the trends of prescribed medicines and other diagnosis results. Out of 853 patients, the male and female patients were distributed in the ratio 5.8:4.2 with most patients coming from urban areas and suffering from lipid level disorder (more than 48%). The other CVDs reported were hypertension (30%), heart failure (28.5%), myocardial infarction (20.9%), ischemic heart disease (19.9%), stroke (17.1%) and angina (11%). Among all the combinations of drugs advised, the antianginal, ACE inhibitor and coronary vasodilator combination had a prevalence of 27.5% which was the maximum while the second most prescribed combination was the beta blocker and antihyperlipidemic drug (21.3%). This particular study allowed a detailed and extensive analysis of the CVDs, different methods of diagnosis and preferred treatment choice by the physicians and will also further help to determine and evaluate the usage of cardiovascular drugs utilisation in Bangladesh to successfully manage CVDs in the future.

Keywords: Cholesterol; Cardiovascular Disease; Demographic; Circulatory; Lipoprotein; Triglyceride.

INTRODUCTION

Cardiovascular disease (CVD) is a class of diseases that is the leading cause of global death at present and is responsible for 75% of the deaths occurring in developing countries like Bangladesh[1]. Analysing the current situation, it has been predicted that 25 million people will face death due to CVDs by 2030 [2, 3]. The most prominent CVDs that prevails at present are ischemic heart disease, cerebrovascular disease (stroke), peripheral vascular disease, heart failure, rheumatic heart disease, congenital heart disease and acute myeloid leukaemia (AML)[3, 4]. Among these, coronary artery diseases and stroke are the most common causes of death from CVDs. The present review says that both mortality and morbidity due to CVDs is increasing in Bangladesh.

A study carried out in Bangladesh revealed that 27.93%, 21.08% and 13.41% stroke patients with lipid disorder had high cholesterol, low-density lipoprotein (LDL) and triglycerides (TG) level, respectively[4]. From this data, a clear picture of the causes behind CVD can be obtained. The common risk factors of CVDs were identified by interviewing a number of physicians in these two hospitals, having at least 10 years of work experience along with additional questions in the questionnaire inquiring patients about their daily habits. The final findings were unhealthy diet, physical inactivity, tobacco and alcohol use. These eventually lead to abnormal blood lipid profile and obesity and thus CVDs[5].

The approach of cardiovascular disease management is more preventive than cure. But during this study, it was markedly seen that cardiovascular drugs are effectively lifesaving too. The possible treatment options for the management of CVDs are vasodilators, beta-blockers, lipid lowering agents, calcium channel blockers, ACE inhibitors, diuretics, etc[6].

The purpose of this study was to understand the prevalence of cardiovascular and other circulatory diseases and the prescribing patterns of cardiovascular medicines. Focusing on this purpose, a fixed number of patients visiting the National Institute of Cardiovascular Disease (NICVD) and National Heart Foundation Hospital & Research Institute were randomly selected and their prescribed medicines were scrutinised for trend analysis.

In the past, population-based studies carried out to perceive the trends in drug use that have high significance for patient health outcomes, treatment and other health services. To carry out an efficient study, it requires effective information on the patient level characteristics that are significantly important for determining the best treatment. The main concern of this study was not only to observe the trend of drugs but to also observe the CVDs with maximum prevalence, the reasons behind them, types of treatment for all kinds of CVDs reported and the reason choosing the particular drug singly or in a combination with other therapeutic classes.

METHODS AND MATERIALS

The conducted study was aimed to find out the prevalence of CVD among patients who visited the National Institute of Cardiovascular Disease (NICVD) and the National Heart Foundation Hospital & Research Institute, both situated in Dhaka, Bangladesh (NHFH). Along with the CVD, the different therapeutic groups of drugs prescribed to the patients were also observed and noted. NICVD and NHFH are most vital and specialised healthcare institute for CVDs and deals with the maximum number of CVD patients in Bangladesh. Patients from both the urban regions and rural regions of the country are found to visit these hospitals to seek the best possible healthcare services regarding CVDs. Critical and sophisticated patients are referred to these institutes and their treatment patterns itself interpreted as a reference by the physicians residing

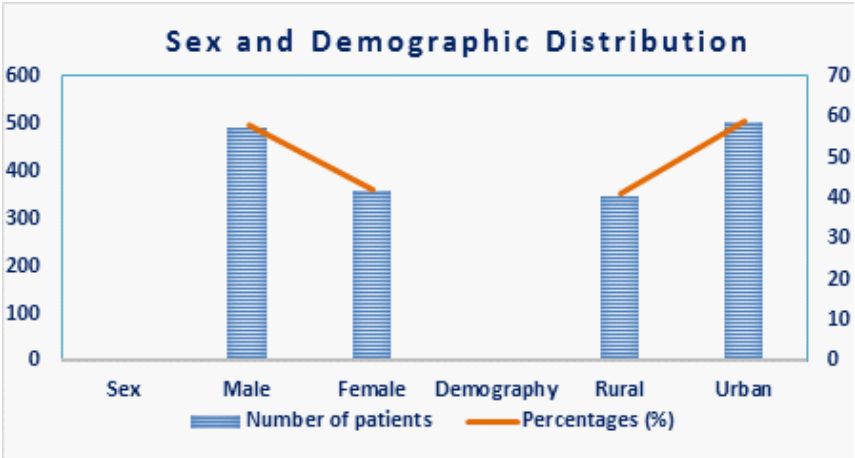

Fig. 1: Distribution of sex and demographic factors for cardiac disorder

Table 1: Distribution of sex and demographic factors for cardiac disorder (n=853)

	Number of patients	Percentages (%)
Sex		
Male	493	57.8
Female	360	42.2
Demography		
Rural	349	40.9
Urban	504	59.1

Table 2: Scenario of different medical conditions among the patients (n=853)

Medicalcondition	Number of patients	Percentages (%)
Lipid level disorder	415	48.7
Hypertension	256	30
Heart failure	243	28.5
Myocardial infarction	179	20.9
Ischemic heart disease	170	19.9
Stroke	146	17.1
Angina	94	11

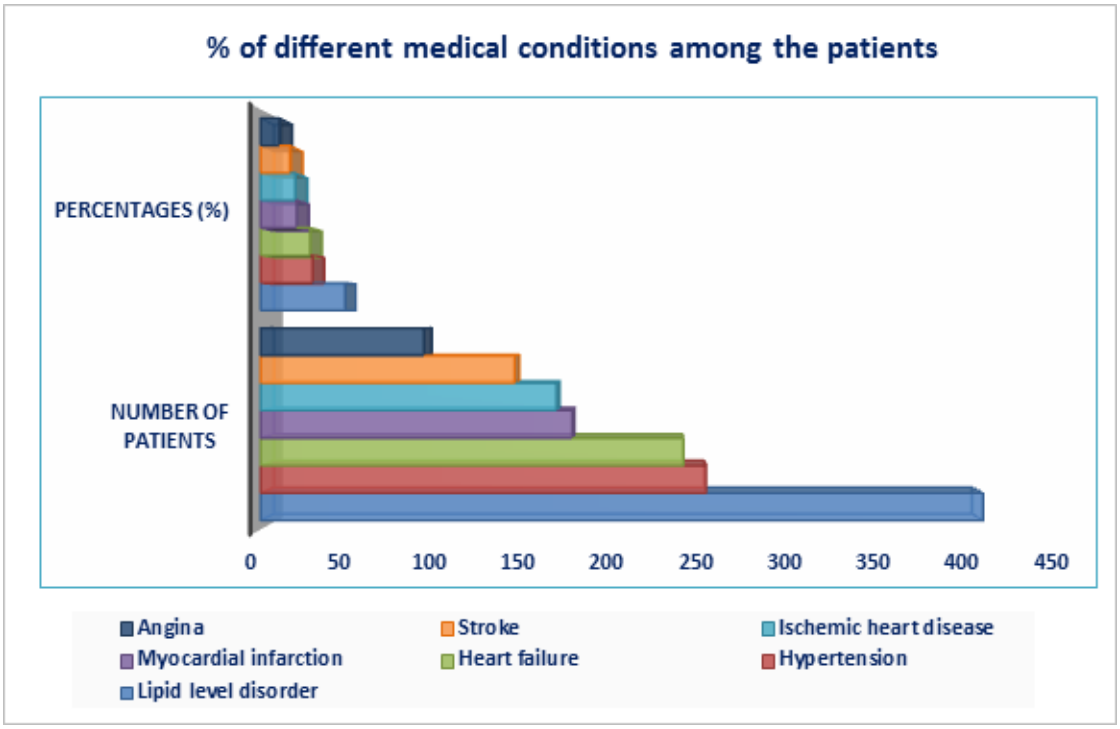

Fig. 2: Scenario of different medical conditions among the patients

distant places from the city. Moreover, these centres receive a mixture of all classes of people in the society to receive high-intensity tertiary care. These institutes were selected to obtain a cross sectional type of data and to extrapolate the current practice prevailing in Bangladesh.

This descriptive study was carried out for a period of three months from July 2016 to the end of September 2016 among 853 patients, of which 427 patients visited NICVD while the other 426 visited the National Heart Foundation Hospital. The patients were questioned with a self-developed questionnaire and their prescriptions were analysed to comprehend the trends of prescribed medicines and the diagnosis from their lipid profile, electrocardiogram (ECG), blood glucose level, echocardiogram, blood pressure and other blood profiles. For statistical significance, all the data were incorporate into the computer and analysed using the modified Wald method in

GraphPad prism software package and MS Excel 2013[7]. Patients who were non-cooperative or who denied to face the questionnaire were excluded from the study.

RESULTS AND DISCUSSION

The study was carried out in two tertiary level hospitals situated at the heart of the city.

Table 3: Percentages of therapeutic classes prescribed (n=853)

Therapeutic classes	Number of patients	Perc. (%)
Anxiolytics	83.2	710
Antiatherogenic	82.3	702
Antianginal	78.9	673
Lipid lowering drugs	77.3	659
Others	62.3	531
Beta-blockers	52.1	444
Diuretics	39.2	334
ACE inhibitors	32.4	276
Angiotensin receptor blockers	15.4	131
Calcium channel blockers	13.0	111

Socio-demographic characteristics

Among the 853 patients who visited the centres, it was observed that 57.8% of the patients were male while 42.2% were female. 59.1% of the patients belonged to demographically developed areas while 40.9% belonged to rural areas [8, 9]. All patients belonged to an age group of above 30.

From the data, it is apparent that the male patients are more prone to CVDs than female patients. This was due to the social structure of Bangladesh which has more privileges for men than women. Additionally, it was reported that more patients were from the urban regions compared to the rural regions which can be explained by the daily habits of people in the urban area giving rise to the risk factors of CVDs [10].

Different medical disorders

From the diagnosis made by the physicians, it was seen that the patients suffered from different CVDs. It was reported that most patients, i.e. 48.7% suffered from lipid level disorder. 30% suffered from hypertension, 28.5% from heart failure, 20.9% from myocardial infarction and 19.9% from ischemic heart disease. It was also seen that 17.1% of the patients suffered a stroke while 11% of the patients suffered from angina.

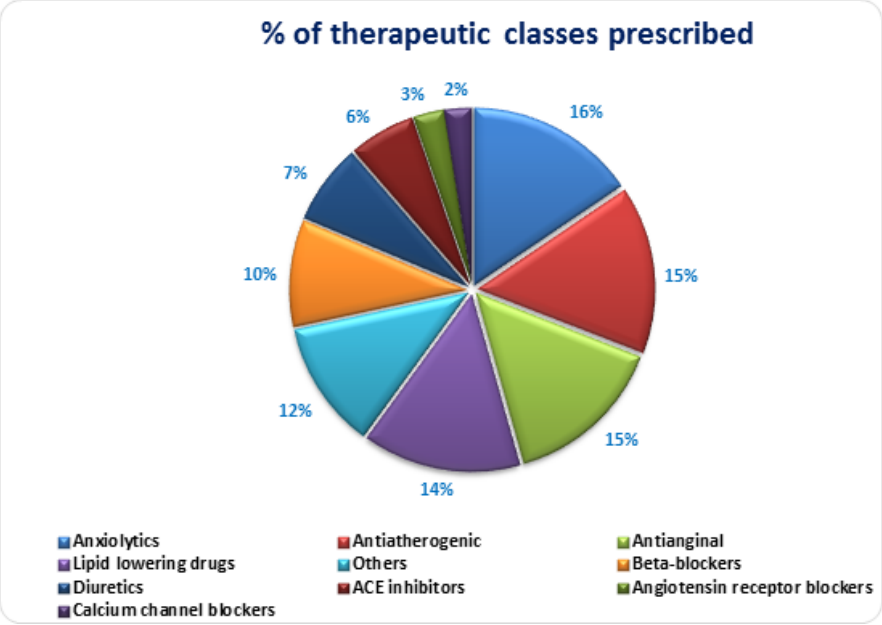

Fig. 3: Percentages of therapeutic classes prescribed

Table 4: Percentages of therapeutic combinations prescribed by physicians

Therapeutic combination prescribed	Number of patients	Percentages (%)
ACE inhibitor + Beta blocker	47	5.5
Beta blocker + Angiotensin receptor antagonist	47	5.5
Antiangial + Antihyperlipidemic	47	5.5
Beta blocker + Antihyperlipidemic	182	21.3
ACE inhibitor + Antihyperlipidemic	92	10.8
ACE inhibitor + Antiangial	92	10.8
² blocker + Antiangial	92	10.8
Antihyperlipidemic + Angiotensin II receptor antagonist	23	2.7
Antihyperlipidemic + Coronary vasodilator	23	2.7
ACE inhibitor + Diuretics	23	2.7
Antihyperlipidemic + Beta blocker	47	5.5
Antiangial + Coronary vasodilator	23	2.7
ACE inhibitor + Coronary vasodilator	47	5.5
ACE inhibitor + Antiangial + Antihyperlipidemic	47	5.5
² blocker + Antihyperlipidemic + ACE inhibitor	92	10.8
Antiangial + ACE inhibitor + Coronary vasodilator	235	27.5
ACE inhibitor + Beta blocker + Antiangial	23	2.7
Angiotensin II receptor antagonist + ACE inhibitor+ Antihyperlipidemic	23	2.7

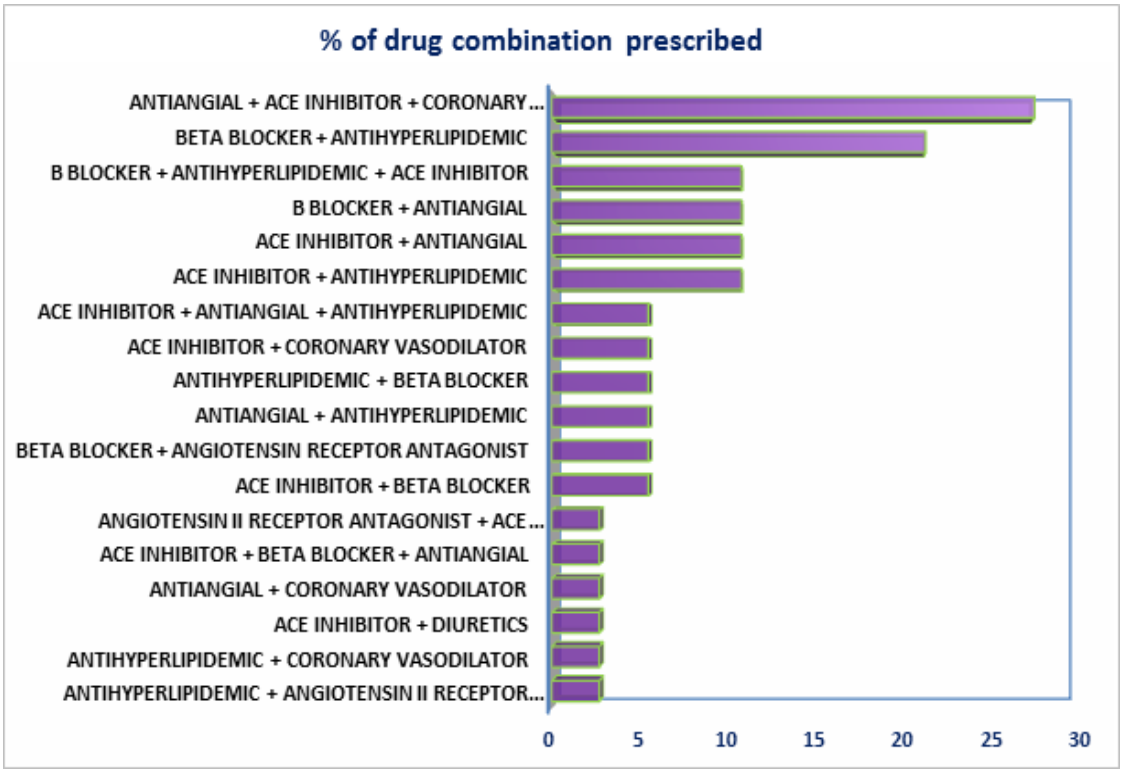

Fig. 4: % of drug combination prescribed

Most patients suffered from high cholesterol level, according to what the report suggested. This is probably a result of unhealthy diet, less physical activity and urbanisation. Hypertension was the most prevalent CVD and in one of the past studies, it has been seen that hypertension is the second leading CVD.

Drugs prescribed for different conditions

Different drugs of different pharmacological therapeutic classes were prescribed by the physicians, which have been categorised as shown below. More than 77% of the patients were advised to take lipid-lowering drugs and more than 82% patients were asked to take antiatherogenic drugs. Several antihypertensive drugs such beta blockers, ACE inhibitors, angiotensin receptor blockers and diuretics were prescribed in percentages of 52.1%, 32.4%, 15.4% and 39.2% respectively. The physicians also prescribed anxiolytics to 83.2% of the patients regardless of anxiety.

In most cases, the patients were prescribed with 6.35 drugs on an average to treat all the clinical complications of cardiovascular disease, along with daily exercises and a proper healthy diet. Coronary heart disease patients were treated with antiatherogenic agents to prevent clotting at the coronary vessels because it may result in sudden myocardial infarction or stroke.

Beta-adrenergic receptor blockers are used mostly to treat hypertension. Beta-blockers are believed to reduce mortality rate when used for the prevention of myocardial infarction and chronic heart insufficiency[11]. The patients took ACE inhibitors and diuretics with very close frequency. Diuretics were recommended to older patients with type *I* and *II* hypertension as initial monotherapy or combined with other antihypertensives for patients with severe hypertension[12, 13]. The study significantly showed that angiotensin receptor blockers and calcium channel blockers were the least prescribed drugs by the specialists.

Therapeutic combinations prescribed

Among all the prescriptions of all the patients, it was mostly seen that physicians advised them to take a combination of different drug classes rather than a single class. It has been observed that most patients were prescribed to take the antianginal, ACE inhibitor and coronary vasodilator combination (more than 27%). Other class combinations have been seen to be advised more or less to similar percentages.

Most patients were seen to be prescribed with more than one drug and a combination of three drug classes. Among all the combinations the antianginal, ACE inhibitor and coronary vasodilator combination had a prevalence of 27.5% which was the maximum. The second most prescribed combination was the beta blocker and antihyperlipidemic drug.

CONCLUSION

Several population-based studies have researched the trends in the drug use in the past but clinical studies on CVDs are not quite well known in Bangladesh. This particular study allowed a detailed and extensive analysis of the CVDs, different methods of diagnosis and preferred treatment choice by the physicians. The study aims to draw the attention of the Directorate General of Drug Administration (DGDA) to closely inspect the trends of drugs, prescribed by the specialists.

Statistical analysis reveals that statins and antiatherogenic agents are more dominantly prescribed or used cardiovascular drugs compared to others. Beta-blockers, ACE inhibitors and diuretics are predominant in the antihypertensive group. Changes in patterns of cardiovascular disease management and drug use are changing day by day. DGDA should undertake measures to change the law prescribing practice of ARBs and CCBs. This study will also further help to determine and evaluate the usage of cardiovascular drugs utilisation in Bangladesh.

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