DIAGNOSIS OF HEART DISEASES AND ITS TREATMENT APPROACH IN URBAN AREAS OF BANGLADESH

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Abstract

Non-communicable diseases (NCDs) creates a new havoc globally. Bangladesh has been facing a dual burden of existing infectious diseases and escalating rise of NCDs like diabetes, heart disease, stroke, cancer, chronic respiratory disease, etc. For getting prepared for the challenge of these diseases, information regarding their distribution and determinants is indispensable. This research was aimed to find out the scenario of heart diseases and its treatment approach in urban areas (N=212) of Bangladesh. The study is an exploratory research which was initiated to explore the issues which are necessary for the study using both primary and secondary data. A total of 212 heart disease patients of different hospitals and diagnostic centers across the Dhaka city were selected using a non-probability sampling technique. The primary data has been collected from original sources by the doctors and patients through hospital. The secondary sources of data consist of all published and reported materials including books, journals, articles etc. All the collected data were analyzed using MS excel version 10. Most of the respondents (28.8%) were in the age group 50-59 years and the majority of the respondents in this group were male. On the other hand, people aged 40 years and above are in most vulnerable condition in case of both male and female. Cardiovascular disease affects low and middle-income countries even more than high-income countries. Simple lifestyle changes can help to reduce the risk for heart disease and consulting a doctor for guidance.

Keywords: *Heart disease, cardio vascular disease, non-communicable disease, cancer, chronic respiratory disease*

Introduction

Now a days some chronic disease is going to be our national burden, heart diseases are most common among them. There are so many public and private cardiac specialized hospital in Bangladesh especially in Dhaka city, unfortunately the number of cardiac patient is increasing in a rapid rate. According to the latest WHO data published in May 2014 Coronary Heart Disease Deaths in Bangladesh reached 50,708 or 6.96% of total deaths. The age adjusted Death Rate is 53.53 per 100,000 of population ranks Bangladesh. Most of the people are not aware about risk factor and its treatment approach. The cardiovascular system is responsible for transporting nutrients and removing gaseous waste from the body. This system is comprised of the heart and the circulatory system. Structures of the cardiovascular system include the heart, blood vessels, and blood. The lymphatic system is also closely associated with the cardiovascular system. The heart is the organ that supplies blood and oxygen to all parts of the body. This amazing muscle produces electrical impulses through a process called cardiac conduction. These impulses cause the heart to contract and then relax, producing what is known as a heartbeat [1]. The coronary circulation system provides a blood supply to the heart muscle itself [2]

Cardiovascular disease (CVD) is a class of diseases that involve the heart or blood vessels. Cardiovascular disease includes coronary artery diseases (CAD) such as angina and myocardial infarction (commonly known as a heart attack).Other CVDs include stroke, heart failure, hypertensive heart disease, rheumatic heart disease, cardiomyopathy, heart arrhythmia, congenital heart disease, valvular heart disease, carditis, aortic aneurysms, peripheral artery disease, thromboembolic disease, and venous thrombosis.[3] Coronary artery disease, stroke, and peripheral artery disease involve atherosclerosis. This may be caused by high blood pressure, smoking, diabetes, lack of exercise, obesity, high blood cholesterol, poor diet, and excessive alcohol consumption, among others. High blood pressure results in 13% of CVD deaths, while tobacco results in 9%, diabetes 6%, lack of exercise 6% and obesity 5%. Rheumatic heart disease may follow untreated strep throat. It is estimated that 90% of CVD is preventable. Treating people who have strep throat with antibiotics can decrease the risk of rheumatic heart disease. The effect of the use of aspirin in people who are otherwise healthy is of unclear benefit.[4]

Cardiovascular diseases are the leading cause of death globally. This is true in all areas of the world except Africa. Together they resulted in 17.9 million deaths (32.1%) in 2015 up from 12.3 million (25.8%) in 1990. Deaths, at a given age, from CVD are more common and have been increasing in much of the developing world, while rates have declined in most of the developed world since the 1970s. Coronary artery disease and stroke account for 80% of CVD deaths in males and 75% of CVD deaths in females. Most cardiovascular disease affects older adults. In the United States 11% of people between 20 and 40 have CVD, while 37% between 40 and 60, 71% of people between 60 and 80, and 85% of people over 80 have CVD. The average age of death from coronary artery disease in the developed world is around 80 while it is around 68 in the developing world. Disease onset is typically seven to ten years earlier in men as compared to women.[5] Cardiovascular disease and all-cause mortality are increased in men with the metabolic syndrome, even in the absence of baseline CVD and diabetes [6]. Cardiovascular disease and diabetes are well-defined clinical entities with a high mortality rate and require aggressive intervention [7-9]. In patients with CAD, depression predicts future cardiac events [10-12] and hastens mortality [13-14]. Since the 1960s, multiple longitudinal and cross sectional studies have scrutinized the association of cardiovascular disease (CVD), especially CAD, with depressive symptoms, as well as with major depression [15]. There are many risk factors for heart diseases: age, gender, tobacco use, physical inactivity, excessive alcohol consumption, unhealthy diet, obesity, genetic predisposition and family history of cardiovascular disease, raised blood pressure (hypertension), raised blood sugar (diabetes mellitus), raised blood cholesterol (hyperlipidemia), psycho social factors, poverty and low educational status, and air pollution. While the individual contribution of each risk factor varies between different communities or ethnic groups the overall contribution of these risk factors is very

consistent. Some of these risk factors, such as age, gender or family history/genetic predisposition, are immutable; however, many important cardiovascular risk factors are modifiable by lifestyle change, social change, drug treatment (for example prevention of hypertension, hyperlipidemia, and diabetes). People with obesity are at increased risk of atherosclerosis of the coronary arteries [16]. Coronary heart diseases are 2 to 5 times more common among middle-aged men than women. In a study done by the World Health Organization, sex contributes to approximately 40% of the variation in sex ratios of coronary heart disease mortality [17]. The Commission on Social Determinants of Health recommended that more equal distributions of power, wealth, education, housing, environmental factors, nutrition, and health care were needed to address inequalities in cardiovascular disease and non-communicable diseases [18].

For Treatment of cardiovascular disease we can use Proton-pump inhibitors (PPIs), ACE Inhibitors, Angiotension II Receptor, Antiarrhythmics, Antiplatelet Drugs, Aspirin Therapy, Beta-Blocker, Calcium Channel Blocker Drugs, Clot Buster Drugs, Digoxin, Diuretics, Nitrates: Warfarin and Other Blood Thinners: .[19-20]. Cardiovascular disease is the largest contributor to all-cause mortality in the United States and accounts for one-third of the excess mortality experienced by non- Hispanic black compared with non-Hispanic white Americans [21]. The number of Americans that suffer from heart attacks every year is over 1 million with nearly half of African American men and women having a form of cardiovascular disease [22]. To reduce the risk of heart disease proper measures are needed to help educate low income communities on how to lower their risk as well as provide communities accessibility to affordable fresh produce and health facilities. [23]

Many low income communities inhabited by mostly minorities do not have the proper resources to help make the proper lifestyle changes, and many low income minorities may not receive the proper education from healthcare providers due to lack of health care [24]. Aggressive management of modifiable risk factors reduces cardiovascular events and should accompany appropriate revascularization [25]. The concept of "interventional cardiology" must expand beyond mechanical revascularization to embrace preventive interventions that forestall future events [26]. For most populations, the last century has witnessed the most dramatic improvements in health in history. Life expectancy at birth has increased from a global average of 46 years in 1950 to 66 years in 1998 [27]. For countries in the earliest stage of development, the predominant circulatory diseases are rheumatic heart disease, those due to other infections, and nutritional deficiency–related disorders of the heart muscle [28]. Non communicable diseases predominate, with the highest mortality caused by atherosclerotic CVD, most frequently ischemic heart disease and atherothrombotic stroke, especially at ages below 50 years [29]. This phase is found in urban India, Latin America, and the former socialist countries. [30]

The main purpose of this study is to evaluate the present scenario of heart disease among the people who are living in urban areas, examine the diagnosis and treatment approach of these disease, evaluate the prescribing trends of medicine among the cardiac patient and investigate the risk factors and other disease condition associate with this disease.

Materials and Methods

Research Methodology

Methodology is the way to systematically solve the research problem. This job had been completed by following systematic and sequential steps. Firstly, the research problem was formulated. Secondly, an extensive survey had been taken place to gather relevant and required literature. Thirdly, working hypothesis was developed. Fourthly, a research design had been determined. In the fifth stage as sampling technique had been chosen which is called non probability judgment sampling. Sixthly, both the primary and secondary data were collected. At the final stage, collected data were analyzed and arranged as per the study demands.

Research Design

The study has been initiated to explore the issues which are necessary for the study. So the study is an exploratory research. To complete the study both primary and secondary data has been used.

Primary data

The primary data has been collected from original sources by the doctors and patients through hospital. The primary data are those which are collected are accurate as per their previous record. So the primary data are assembled from the doctors and the patient's record. Primary data sources are: Data collection through visiting different hospitals and diagnostic centers.

Work experience gathered from hospital during that period.

Discussion with doctors, patients and post-graduate students.

Observation during checking prescription.

Secondary data

On the other hand, the secondary data are those which have already been collected by someone else. Secondary sources of data consist of all published and reported materials including books, journals, articles etc. Primary data sources are:

Other information was obtained from various corresponding thesis, journal, articles published cardiac department of different hospitals.

Internet was one of the important sources for secondary data collection.

Sample Design

The target population of this report is the Heart Disease patients of different hospitals and diagnostic centers.

Sample Size

The sample size of the study is 212 patients of Cardiac Hospitals of Dhaka city.

Data Analysis

All the data was analyzed by MS excel version 10

Results and discussion

Table 1 showed that most of the respondents were male (66.5%) and the rest of them were female (33.5%). Most of the respondents (28.8%) were in the age group 50-59 years and the majority of the respondents in this group were male. On the other hand, people aged 40 years and above are in most vulnerable condition in case of both male and female. Normal aging is associated with a decreased compliance of the central arteries due to a number of age-related changes in the structural components in the artery. Although gender is increasingly perceived as a key determinant in health and illness,

systematic gender studies in medicine are still lacking. For a long time, cardiovascular disease (CVD) has been seen as a "male" disease, due to men's higher absolute risk compared with women, but the relative risk in women of CVD morbidity and mortality is actually higher. Current knowledge points to important gender differences in age of onset, symptom presentation, management, and outcome, as well as traditional and psychosocial risk factors. Compared with men, CVD risk in women is increased to a greater extent by some traditional factors (eg, diabetes, hypertension, hypercholesterolemia, obesity,) and socioeconomic and psychosocial factors also seem to have a higher impact on CVD in women [31]. With respect la differences in CVD management, a gender bias in favor of men has to be taken into account, in spite of greater age and higher comorbidity in women, possibly contributing to a poorer outcome. Heart attacks and heart failure are usually the end result of blockages forming in the arteries of the heart caused by atherosclerosis.

If we go through the table-2 and table-3 we can see the common blood and urine tests which has been priscribed by doctors for the CVD patients along with ECG, ECO, Angiogram etc. We can consider sometimes thse tests are unnecessary and just a way to extort money from the patient. An ECG (electrocardiogram) provides information about heart rate and rhythm, and shows if there is enlargement of the heart due to high blood pressure (hypertension) or evidence of a previous heart attack (myocardial infarction). The resting ECG is different from a stress or exercise ECG or cardiac imaging test. Early detection of cardiovascular disease by ECG included as a compulsory study for primary prevention in the effectively eliminate the premature mortality. Expansion of the list of biochemical and physiological factors to include an element of ECG monitoring will allow for an early detection of symptoms of the disease activity and will consequently help to protect the Polish population against sudden death from heart disease.

From the above table4 we see a notable number of respondents age aange (20 - 29) are suffering from CVD.An angiotensin-converting-enzyme inhibitor (ACE inhibitor) is a pharmaceutical drug used primarily for the treatment of hypertension

(elevated blood pressure) and congestive heart failure. This group of drugs causes relaxation of blood vessels as well as a decrease in blood volume, which leads to lower blood pressure and decreased oxygen demand from the heart. They inhibit the angiotensin-converting enzyme, an important component of the renin–angiotensin system. Frequently prescribed ACE inhibitors include benazepril, zofenopril, perindopril, trandolapril, captopril, enalapril, lisinopril, and ramipril.

Benzodiazepines enhance the effect of the neurotransmitter gamma-aminobutyric acid (GABA) at the GABAA receptor, resulting in sedative, hypnotic (sleep-inducing), anxiolytic (anti-anxiety),anticonvulsant, and muscle relaxant properties. High doses of many shorter-acting benzodiazepines may also cause anterograde amnesia and dissociation. These properties make benzodiazepines useful in treating anxiety, insomnia, agitation, seizures, muscle spasms, alcohol withdrawal and as a premedication for medical or dental procedures. Benzodiazepines are categorized as either short-, intermediate-, or long-acting. Short- and intermediate-acting benzodiazepines are preferred for the treatment of insomnia; longer-acting benzodiazepines are recommended for the treatment of anxiety (Table 5-9). Benzodiazepines are generally viewed as safe and effective for short-term use, although cognitive impairment and paradoxical effects such as aggression or behavioral disinhibition occasionally occur.From Table 6 we can say that Beta blockers, Ca-channel, Statin, Benzodiazepine, Diuretics are frequently prescribed by doectors. By observing all the above facts the tendency of taking so many drugs of a patients is alarming.

Conclusion

In conclusion it can be said that, cardiovascular diseases are one of the major health problems throughout the world. Cardiovascular disease in Bangladesh as well as globally is increasing day by day. By doing this study, there are facing difficulties. During the collection of primary data, the patients are sometimes not interesting to share their problems with the researchers.

Keeping our heart healthy is one of the most important ways to make sure we are feeling our very best .As a young person, if we start doing small things every day that keep our body healthy, we have a better chance of living a longer, happier and healthier life .Although heart disease may often be thought of as a problem for men, heart disease is the most common cause of death for both women and men.

Cardiovascular disease affects low- and middle-income countries even more than high-income countries. If we are able to raise awareness among our people about heart diseases, we can expect to reduce the incidence & prevalence of heart diseases in Bangladesh. Emphasis should also be given on our National Health Policy on research in this field. At the same time, continuous scrutiny & data collection are needed for proper management on heart diseases. We can do already something ourself by stopping smoking, eating a healthier diet, taking more exercise, and having our blood pressure, glucose levels and cholesterol levels checked .

Acknowledgement

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Table 1: Age and gender distribution of the respondent (n=212)

Age (years)	Number of Participants		Total
	Male	Female	
≤9	2(1.4)	5(7.0)	7(3.3)
10–19	0(0.0)	4(5.6)	4(1.9)
20–29	5(3.5)	6(8.5)	11(5.2)
30–39	17(12.1)	12(16.9)	29(13.7)
40–49	23(16.3)	19(26.8)	42(19.8)
50–59	35(24.8)	26(36.6)	61(28.8)
60–69	37(26.2)	13(18.3)	50(23.6)
70–79	15(10.6)	7(9.9)	22(10.4)
80-89	7(5.0)	5(7.0)	12(5.7)
Total	141(66.5)	71(33.5)	212(100.0)

Table 2: Common blood tests prescribed by doctor to the CVD Patients

Common Test	Standard Value (average)
Random Blood Sugar (RBS)	4.4 / 0.5 mmol / l
Blood urea	15 – 50 mg / dl
S. Creatinine	0.6 – 1.4 mg / dl
S.Bilirubin	0.3-1.0mg/dl
Electrolytes	
Sodium (NA)	135 – 148 mmol / l
Potassium (K)	3.5 – 5.3 mmol / l
Chloride (C)	98 – 100 mmol / l
Blood CBC	
Haemoglobin (HB)	12 -16 gm / dl
Haemoglobin (HB) %	75 – 100 %
ESR	O – 20 mm
Total Count (TC)	
WBC	5000 – 10000 / cu.mm
Differential Count (DC)	
Polymorphs	45 – 70 %
Lymphocytes	20 – 40 %
Monocytes	02 – 06 %
Eosinophils	01 – 04 %
Basophils	00 – 02 %
Lipid Profile	
Cholesterol	<200 mg/dl
HDL	>60 mg/dl
LDL	<100 mg/dl

Table 3: Common test of Urine Doctors prescribed for cardiac patients

Test	Result(Standard parameter)
Quantity	Sufficient
Color	Straw
Appearance	Clear
Sediment	Nil
Reaction (PH)	Acidic
Excess Phosphate	Nil
Albumin	Trace
Sugar (Reducing Subs)	Nil
Epithelial Cells	0 – 2 HPF
Pus Cells	1 – 2 HPF

Table 4: Respondent Age Range (20 - 29) are taking following medicine

SL #	Class of Drug / Treatment Puspose	Name of the Drug
1	Supplements	Vitamin
2	Ca. channel antagonist	Cilnidipine
3	Used to treat various bacterial infection	Fluclonoxacillin
4	Proton pump Inhibitor	Rabeprazole , Esomeprazole
5	benzodiazepines	clonezepam
6	Leukotriene receptor antagonist	Montelukast
7	NSAID	Aceclofenac, Baclofen

Table 5: Respondent Age Range (30 - 39) are taking following medicine

SL #	Class of Drug / Treatment Puspose	Name of the Drug
1	NSAID	Paracetamol
2	Proton pump Inhibitor	Rabeprazole
4	P2Y 12 Inhibitor	Clopidogrel
5	Salicylates	Aspirin
6	Statin	Atorvastatin
7	Beta blocker	Bisoprolol
8	Angiotensin converting enzyme inhibitor	Ramipril
9	Antihypertensive	Metoprolol tartrate
10	Proton pump Inhibitor	Esomeprazole Mg. trihydrate BP
11	Leukotreine receptor antagonist	Montelukast
12	Ca. channel antagonist	Cilnidipine
13	benzodiazepines	Clonezepam
14	statin	Rosuvastatin
15	Used to treat bacterial infection	ciprofloxacin

Table 6: Respondent Age Range (40 - 49) are taking following medicine

SL #	Class of Drug / Treatment Puspose	Name of the Drug
1	Antiasthmatics	Doxofylline
2	Leutrotriene beceptor antagonist	Montelucast
3	Statins	Rosuvastatin , Atorvastatin
4	Proton pump inhibitor	Esomeprazole mg Trihydrate BP,Rabeprazole
5	Benzodiazepines	Clonazepam,bromazepam
6	P2t 12 inhibitor (used to reduce risk of heart disease)	Clopidogrel
7	Beta blockers	Bisoprolol
8	Thiazide like diuretic	Indapamide
9	Used to treat bacterial infection	Amoxicillin, Clarithromycin
10	salicylates	Aspirin
11	benzo diazepam	bromazepam
12	antihypertensive	Metoprololtartate
13	Angiotensin conversion enzyme inhibitor	Ramipril
14	Ca channel antagonist	Cilnidipine
15	Dopamine antagonists	Domperidon
16	5x – reductase inhibitor	Dutasteride

Table 7: Respondent Age Range (50-59) are taking following medicine

SL #	Class of Drug / Treatment Puspose	Name of the Drug
1	antifungal	Fluconazole
2	Proton pump inhibitor	Esomeprazole, Omeprazole
3	NSAID	Paracetamol
4	salicylates	Aspirin
5	statins	Atorvastation, Rosuvastatin
6	Angiotensir converting enzyme inhibitor	Ramipril
7	P2Y12 inhibitor	Clopidogrel
8	Used for heart failure, high blood pressure	Glyceryl trinitrate
9	antiasthmatics	Doxofylline
10	antyhypertensive	Metaprolol tartrate
11	Angiotensin receptor antagonist	Losartan Potassium
12	Leukotreine receptor antagonist	Montelukast
13	Used for heart failure, high blood pressure	Glyceryl trinitrite
14	Beta blocker	Bisoprolol
15	Benzodiazepines	Bromazepam
16	Ca. channel antagonist	Cilnidipine
17	Thiazide like Diuretic	Indapamide
18	Antidiabetic	Gliclazide
19	benzodiazepines	Alprazolam
20	Supplements	Vitamin

Table 8: Respondent Age Range (60 - 69) are taking following medicine

SL #	Class of Drug / Treatment Puspose	Name of the Drug
1	Leukotreine receptor antagonist	Montelukast
2	Proton pump Inhibitor	Rabeprazole,Omeprazole
3	Beta blockers	Bisoprolol
4	Angiotensin converting enzyme inhibitor	Ramipril
5	Used for heart failure, high blood pressure	Glyceryl trinitrate
6	Statin	Atorvastatin, Rosuvastatin
7	Salicylates	Aspirin
8	Benzodiazepines	Clonazepam
9	P2Y 12 inhibitor	Clopidogrel
10	Angiotensin receptor blocker	Losartan potassium
11	Antiasthmatics	Doxofylline
12	Used for treatment of asthma and in prevention bronchospasm	Salmeterol
13	NSAID	paracetamol
14	Antihypertensive	Metoprolol tartrate
15	Used for heart failure, high blood pressure	Glyceryl trinitrite
16	Dopamine antagonist	Domeperidone

Table 9: Respondent Age Range (70 - 79) are taking following medicine

SL #	Class of Drug / Treatment Puspose	Name of the Drug
1	Salicylates	Aspirin
2	statin	Atorvastatin
3	Angiotensin converting enzyme inhibitor	Ramipril
4	Proton pump Inhibitor	Rabeprazol ,Omeprazole
5	Beta blocker	Bisoprolol
6	Angiotensin receptor blocker	Losartan potassium
7	NSAID	Vitamin
8	Lukotreine receptor antagonist	Montelukast
9	Benzodiazepines	Clonazepam
10	Used for heart failure, high blood pressure	Glyceryl trinitrate
11	P2T 12 inhibitor	Clopidogrel
12	Dopamine antagonist	Domperidone

Table 10: Respondent Age Range (80 - 89) are taking following medicine

SL #	Class of Drug / Treatment Purpose	Name of the Drug
1	Proton pump Inhibitor	Rebeprazole,Omeprazole
2	Salicylates	Aspirin
3	Used for heart failure, high blood pressure	Glyceryl trinitrate
5	Statin	Atorvastatin
6	NSAID	Paracetamol
7	Anti-asthmatics	Doxofylline
8	Angiotensin receptor blocker	Losartan potassium
9	Proton pump Inhibitor	Omeprazole

Figure 1: Maximum prescribed drug