Survey on Causes and management of coronary heart diseases: A Prescription study in National Heart Foundation & Research Institute

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Abstract

Background: Coronary heart disease is a type of heart disease in which the arteries of the heart fail to deliver enough oxygen-rich blood to the heart. Coronary heart disease is the major cause of death and morbidity in Bangladesh. The goal of this study was to assess the current prevalence of coronary heart disease, causes as well as management.

Method: This analysis, which took place from August to September 2023 at National Heart Foundation Hospital & Research Institute, aims to examine coronary heart disease risk variables in 150 patient's prescription.

Result: From this study, we can find that most of the male patients were affected in coronary heart disease than female patients. People from 45-49 years were affected most into coronary heart disease. Most of the patients were prescribed combination drug dosage instead of single dosage medicine. Anti-platelet and coronary vasodialators combination medicine took the highest percentage which is 12%. However, among the prescribed therapeutic classes, coronary vasodialators was the highest in number (16.67%). Electrocardiogram picked the highest position in diagnosis test. Chest pain is common symptoms during this analysis. Besides, Type II diabetic patient had a great impact in coronary heart disease.

Conclusion: This research primarily focuses on coronary heart disease from a clinical perspective, which might be crucial for Bangladesh's safe and efficient medication delivery system. This research comprised a detailed analysis of the prevalence of coronary heart disease and the management of the disease.

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Chapter One

Introduction

1. Introduction

In wealthy nations, coronary heart disease (CHD) is the single biggest cause of death, while in underdeveloped nations, it is one of the main causes of disease burden [1]. This disease is not communicable [2]. In the last few decades, there has been an epidemic rise in the morbidity and mortality from CHD [3]. According to reports that have just been released, social deprivation and low socio-occupational classes may be linked to CHD [4]. According to the 2017 Global Burden of Diseases (GBD) study survey, non-communicable diseases (NCDs) accounted for 73.4% of all deaths in 2017, while communicable, maternal, neonatal, and nutritional (CMNN) causes accounted for 18.6% and injuries for 8.0% of all deaths [5]. Thirty percent of deaths in women are due to CHD, which is the main cause of mortality in both genders [6]. Ischemia heart disease (IHD), commonly referred to as CHD, is one of the most common cardiovascular diseases (CVDs) in the world, accounting for around 8.9 million deaths and 164.0 million disability-adjusted life years (DALYs) in 2015 [7]. Even though the death rate from CHD has decreased recently, it is still the leading cause of death for adults in the US across all age groups. Because it doesn't happen as often as CHD in older people, CHD in young adults is less well understood, despite the fact that it can have catastrophic effects on young patients and their families [8]. In Bangladesh CHD is become major issue and many people died because of improper knowledge about it [9]. Bangladesh underwent an advanced stage of civilization in the decades before its explosive economic growth, and it is currently categorized as an emerging country. Because of the sedentary lifestyles that follow from expansion and urbanization, there is an assumption that the prevalence of cardiac diseases would rise. This refers to changes in eating patterns, such as increased accessibility and demand for processed food and erroneous timing of meals [10]. The assessment of quality of life as a predictor of health outcomes in individuals with CHD has grown significantly and quickly. Patients' quality of life may be negatively impacted by a variety of factors during the clinical course of CHD, including angina and heart failure symptoms, restricted exercise tolerance associated with these symptoms, physical debility, and psychological stress brought on by ongoing stress. These days, modern therapies concentrate on enhancing quality of life in addition to life expectancy, symptoms, and functional status. Therefore, it is thought that improving health-related quality of life (HRQL) is crucial for both determining the primary result and the treatment effect [11]. Despite geographical differences caused by the level of economic development and social organization, the global frequency of these CHD-related clinical symptoms is on the rise [12]. In accordance with epidemiology, the incidence of angina,

sudden death, and the three elementary clinical signs of coronary heart disease vary with age, gender, and ethnicity at the individual level and with country, region, and socioeconomic strata within countries at the aggregate level [13]. Due to increasing life expectancy worldwide and a higher probability of CHD with age, increases in CHD have been anticipated, with CHD turning into as the most prevalent cause of death internationally. The challenges in long-term forecasting of population levels and trends in the disease are further demonstrated by the inability to accurately forecast, or even to offer a convincing explanation in retrospect, for the start of the decline in CHD death rates in the United States and most other westernized industrialized nations in the 1960s. As of this writing, there is still dispute on the relative contributions of minimizing incidence and reducing case fatality to the corresponding decrease in CHD mortality in these countries [14] [15]. The unexpected global rise in obesity that has occurred recently serves as another example of how trends in CHD risk-related variables have not been predicted. Furthermore, disparities in mortality between ethnic and socioeconomic groups are growing in the US, and new trend analyses point to a flattening of the CHD decline in the general population despite advances in epidemiology, education, and public health and healthcare initiatives. The causes of the high and growing incidence of coronary heart disease (CHD) in nonmarket- oriented, industrialized eastern European nations are also a source of uncertainty. According to cohort studies conducted in these environments, increased levels of some known risk factors, such smoking and hypertension, only partially account for them [16]. An important public health problem is presented by the growing global epidemic of CHD, despite the current and anticipated future developing amount of epidemiologic and biological information regarding the drivers of the illness in individuals within communities. The burden of CHD on the public health system would be significantly decreased if the distribution of the known risk factors were shifted to lower values for groups with currently high levels of the disease. Evidence suggests that the primary cause of mortality would be replaced by primal prevention, which entails keeping people from accumulating harmful distributions and levels of the recognized coronary risk factors. This objective will be attained via growing awareness of the many theoretical and methodological prerequisites for epidemiological research at various levels of biosocial organization; besides studying the individuals inside populations, epidemiology will concentrate on populations and their characteristics as the research units [17]. However, the death can be reduced of coronary heart disease by creating awareness the people, knowledge about risk factors and management system [18].

1.1 Risk Factors of CHD

Sex, age, and a family member's or personal history of heart disease are non-modifiable hazards for coronary heart disease (CHD). The most significant reversible risk factors include hypertension, high blood pressure, and high cholesterol levels [19] [20] [21]. These have a significant impact on risk, are prevalent in communities, and may be effectively prevented and treated. Another significant risk factor for CHD is low HDL cholesterol. Diabetes, obesity, and physical inactivity are a few more modifiable predictors of risk that should be considered in the therapy of CHD [22] [23]. In the last several years, data has mounted suggesting that elevated levels of fibrinogen, lipoprotein(a), and triglycerides may be linked to a higher risk of coronary heart disease [24]. Polymorphisms and abnormalities in several genes affecting blood pressure regulation, fat and protein metabolism, and the enzymes lipoprotein lipase, glucokinase, and angiotensin-converting enzyme (ACE) are now the focus of a new field of research for candidate risk factors. These genes include apolipoprotein E. Currently being investigated as an additional risk factor is inadequate lipoprotein protection against oxidation [25].

1.2 Management system

The simultaneous administration of beta-blockers and ACE inhibitors is particularly intriguing because of its synergistic effects on the system that comprises renin, angiotensin, and and the sympathetic nerve system, which are two interlinked pathways that modulate cardiovascular risk and disease outcomes [26]. In high-risk patients with coronary artery disease, combining beta-blocking medications aspirin, and drugs called statins drives survival; nevertheless, adding an ACE inhibitor did not boost consequences, despite the fact that congestive heart failure was considered during the experiment [27]. While pharmacotherapy displays efficacy in controlling the symptoms of high cholesterol levels, an integrated regimen may be required for a competent response. Currently, there are five primary kinds of antihyperlipidemic drugs that stop the absorption of cholesterol [28]. Statistics show that a mixture of a calcium inhibitor alongside a beta-blocking medication works far more effectively than either drug utilized alone [29]. The myocardium's availability and demand are complemented by nitrates, beta blockers, and antagonists of calcium channels, which either boost coronary blood flow, diminish cardiac usage of oxygen, or do both [30]. When it comes to refraining from one or more main manifestations of CVD, diuretics that contain thiazide are more inexpensive and efficient. They need to be the main type of treatment for elevated blood pressure [31]. Because calcium channel blocking medications have so many physiological effects, they may be beneficial when treating an assortment of cardiovascular problems [32].

Chapter Two

Literature review

2. Literature Review

1.

A recent meta-analysis that included information pertaining to 376,162 people from 20 trials focused on the following seven pharmaceutical classes: aspirin, ace inhibitors, beta-blocker drugs calcium-channel blockers, antihypertensive receptor blockers, thiazides, and statins. Combination treatment dramatically reduces the risk of coronary heart disease, especially when taken in conjunction with aspirin and drugs that decrease cholesterol, blood pressure, and triglyceride. However only if counseling remains effective perpetually will the entire preventative advantage become apparent [33].

2.

A review of the literature was done to ascertain the extent of the coronary heart disease (CHD) issue among Indians, with a focus on those in Australia. It made use of literary databases, the World Wide Web, and manual inspection of written material. Health care workers should be aware that Indians are more likely than average to develop CHD at a younger age and to have a lower survival rate. This risk is influenced by social, cultural, and genetic factors. It is necessary to investigate the experiences of Indians with CHD in order to customize prevention and rehabilitation plans for this established Australian community group [34].

3.

Some estimates situate the familial aspect of coronary artery disease (CAD), also known as coronary heart disease (CHD), between 40% and 60% of cases. Nevertheless, until recently, it was challenging to determine which genes were associated with CAD. CAD can only be completely prevented by controlling hereditary risk. 33 genetic risk variants for CAD were found as a result of genome-wide association studies (GWAS) made possible by the availability of microarrays containing single-nucleotide polymorphisms. Remarkably, only 10 risk variants are linked to lipids or hypertension, while 23 risk variants influence their risk through unclear pathways. Thus, the pathophysiology of CAD is caused by a number of processes that are still unclear. 9p21.3, the first risk variable identified by GWAS, has a mean increased risk of 25% per copy and is present in 75% of all groups, with the exception of African people. The increased risk of the 33 CAD variations ranges from 6% to 92%, with an average increased risk of 18%, affecting 47% of the population on average. There could be a maximum of 66 risk alleles for each individual. The average per individual in the 23 variations studied by

CARDIOGRAM was 17, the minimum was 7, and the maximum was 37. The odds ratio for the top 10th percentile is 1.88, while the odds ratio for the lowest percentile is 0.55. It is unlikely that routine genetic screening will occur unless genetic testing improves management. Variants in risk should offer new therapeutic targets and pathophysiological insights. Risk variants having the advantage of being constant throughout an individual's lifetime and being unaffected by age, medicine, sex, food, or lifestyle choices, even if they are less powerful predictors of CAD than biomarkers [35].

4.

Both in nations north and south of the equator, coronary heart disease incidence and death show a winter peak and summer trough. A further twenty thousand fatalities occur annually in England and Wales during the winter peak. Seasonal fluctuations in risk variables are probably the cause of this. Many lifestyle risk variables, including nutrition and physical activity, have been shown to exhibit seasonal fluctuations. Still, other research has indicated that ambient temperature has a direct impact on physiological and rheological parameters. We examine current data on seasonal differences in coronary heart disease and potential causes [36].

Chapter Three

Purpose of the Study

3. Purpose of the study

- Analyze the prevalence of Coronary heart diseases (CHD).
- To evaluate the various CHD management strategies, including medication, dietary changes and other medical procedures.
- To create awareness among the people about the Coronary heart diseases.

Chapter Four

Methodology

4. Methodology

The National Heart Foundation Hospital & Research Institute served as the site of this investigation. The location is in Bangladesh's Mirpur-2, Dhaka. About 150 patient prescriptions were included in this investigation. This investigation was conducted during the patient's visit to the doctor’s office. It took around two months to complete the study. Utilized sources of data were the Journal of the American College of Cardiology, Science Direct, Biomedical and pharmacology publications, Scopus, Journal of Hypertension, Circulation, and Google Scholar.

Chapter Five

Result and Discussion

5. Result & Discussion

This examination of trends in the prescribing of heart disease medications was done at the National Heart Foundation Hospital & Research Institute. For the purposes of this investigation, 150 patient prescriptions were examined.

5.1 Gender

	Number of patients (N=150)	Percentage (%)
Male	93	62
Female	57	38

Table: 5.1 Gender

- Throughout this investigation, 62% of the patients were male, making up the majority of the data; the remaining 38% were female.

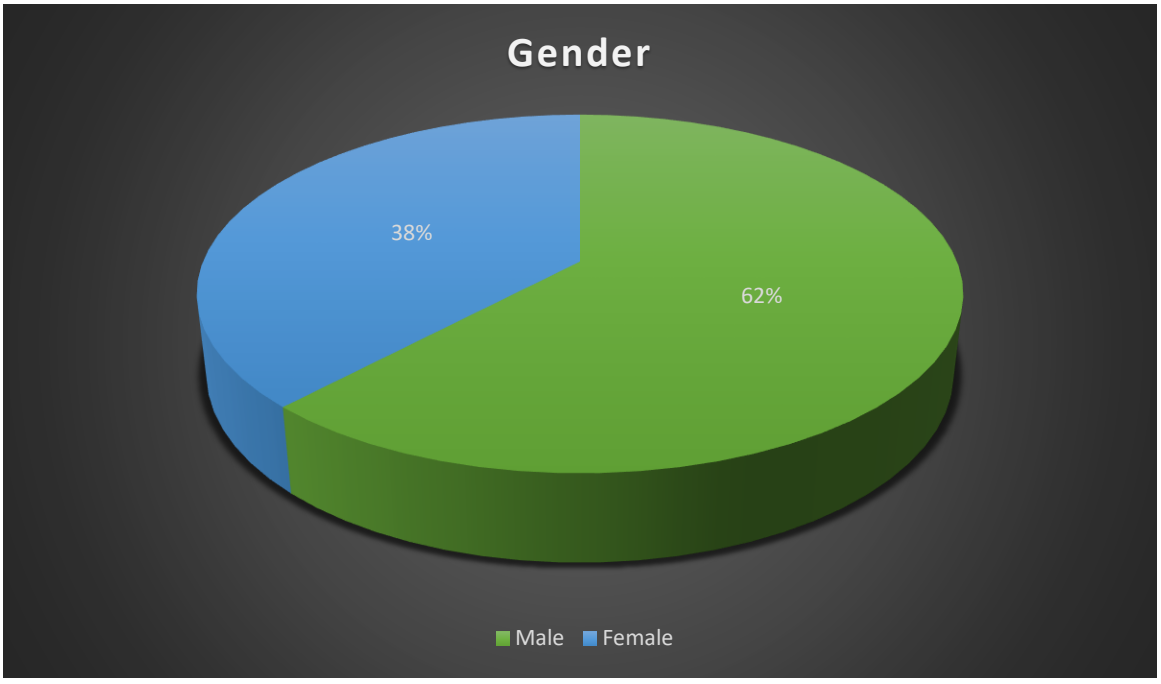

Figure: 5.1 Pie chart of gender

5.2 Age

Age	Number of patient (N=150)	Percentage (%)
40-44	31	20.66
45-49	41	27.34
50-54	29	19.34
55-59	19	12.66
60-64	14	9.34
65-69	9	6
70-74	7	4.66

Table: 5.2 Age

- This study examined the impact that age differences have on the problem of coronary heart disease. The age group of 70–74 had the lowest percentage (4.66%), while the age group of 45–49 had the greatest proportion (27.34).

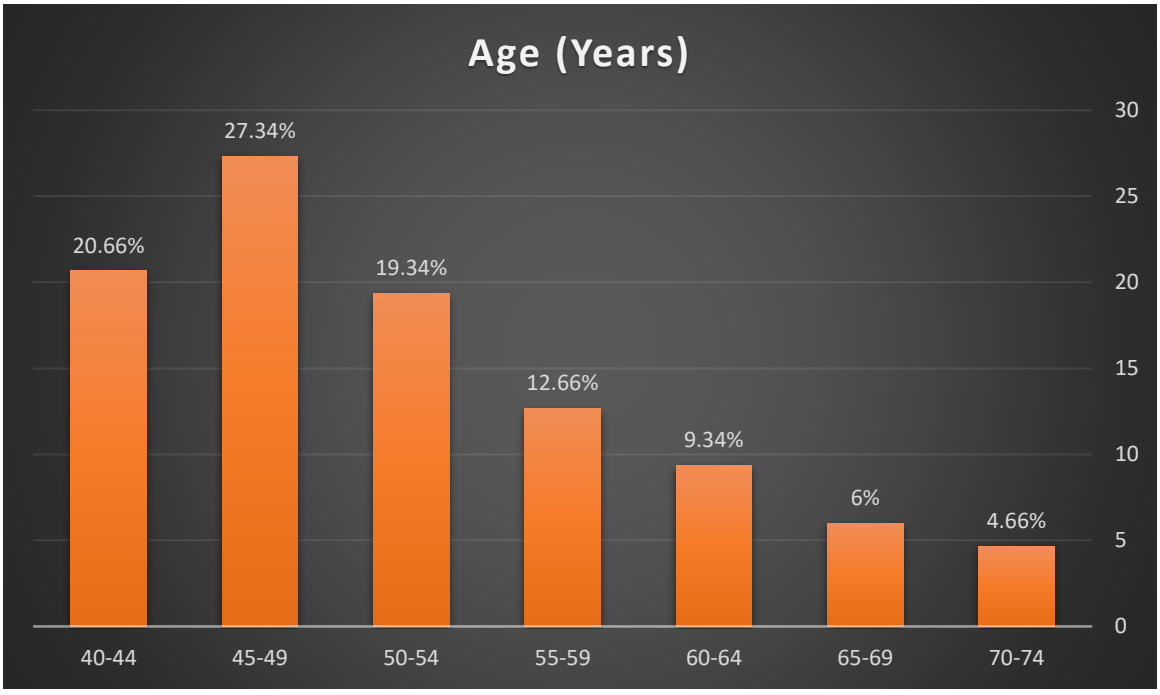

Figure: 5.2 Column Chart of Age

5.3 Number of therapeutic classes prescribed

	Number of patient (N=150)	Percentage (%)
Antiplatelet	21	14
Anti-anginal	15	10
Antihypertensive	5	3.33
angiotensin II receptor blocker	14	9.33
coronary vasodialators	25	16.67
proton pump inhibitor	17	11.33
parenteral anti-coagulants	5	3.33
Beta blockers	16	10.67
ACE inhibitors	13	8.67
diuretics	5	3.33
Ca channel blocker	4	2.67
K channel activator	3	2
Sulfonylureas	4	2.67
Dopamine antagonist	3	2

Table: 5.3 Number of therapeutic classes prescribed

- Doctors prescribed several therapeutic classes of drugs to the patient in this experiment. Coronary vasodialators were the most often administered therapeutic class of drug, at 16.67 percent. Antiplatelet was the second most frequent medicine written, accounting for 14% of prescriptions. With a proportion of 2, K channel activators and dopamine antagonists were the least popular therapeutic pharmaceutical groups that physicians suggested.

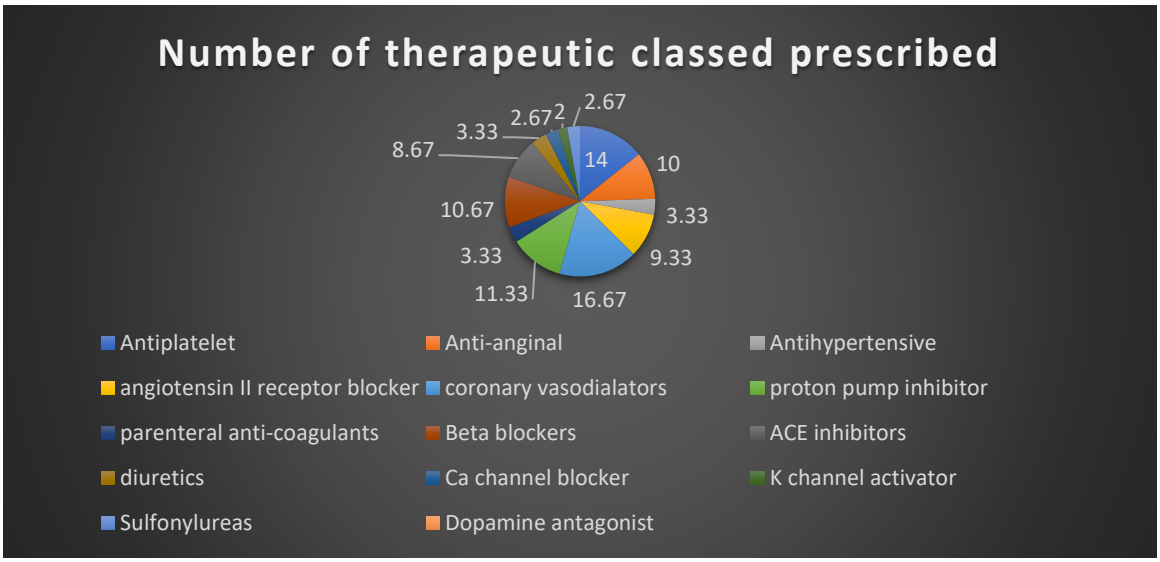

Figure: 5.3 Pie chart of Number of therapeutic classes prescribed

5.4 Combination medicine prescribed

	Number of patient (N=150)	Percentage (%)
ACE inhibitor + Beta blocker	15	10
Beta blocker + Angiotensin II receptor antagonist	12	8
ACE inhibitor + Antianginal	14	9.33
Beta blocker + Diuretics	11	7.34
Beta blocker + Antianginal	9	6
Beta blocker + calcium channel blocker	8	5.33
ACE inhibitor + Diuretics	5	3.33
Antianginal + Coronary vasodilator	10	6.67
ACE inhibitor + calcium channel blocker	13	8.67
Antiplatelet + coronary vasodialators	18	12
Antiplatelet + Ace inhibitor	10	6.67
Beta blocker + Stains	17	11.33
Stains + Angiotensin II receptor antagonist	8	5.33

Table: 5.4 Combination medicine prescribed

- It is evident from going over each patient's prescription that a combination medication is preferable to a single recommended therapy. Twelve percent of all prescriptions were for the combination of coronary vasodialators and antiplatelets, which was the most often prescribed medicine. Combining stains and beta blockers is the second most often advised drug. 11.33 percent was the second-highest percentage related to pharmaceuticals.

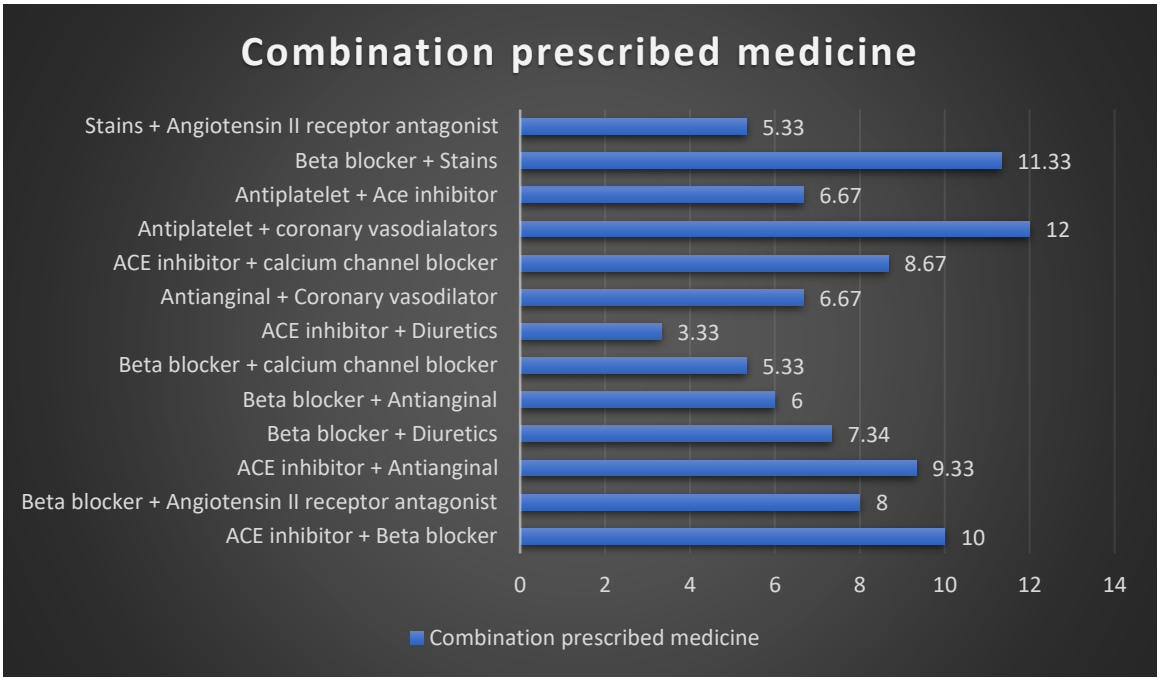

Figure: 5.4 Bar Chart of Combination of prescribed medicine

5.5 Diagnosis test

Test Name	Number of patient (N=150)	Percentage (%)
Electrocardiogram (ECG)	32	21.34
Echocardiogram	26	17.34
Coronary Angiography	31	20.66
Cardiac MRI	17	11.33
Blood Tests	21	14
Calcium Scoring	13	8.67
Fractional Flow Reserve	10	6.66

Table: 5.5 Diagnosis Test

- It was discovered that different diagnostic tests were employed in the case of coronary heart disease during this prescription study. Approximately 21.34% of the ECG was in the highest position. With a percentage of 20.66, coronary angiography was ranked second. On the other hand, the table's lowest fractional flow reserve, at 6.66%, was utilized.

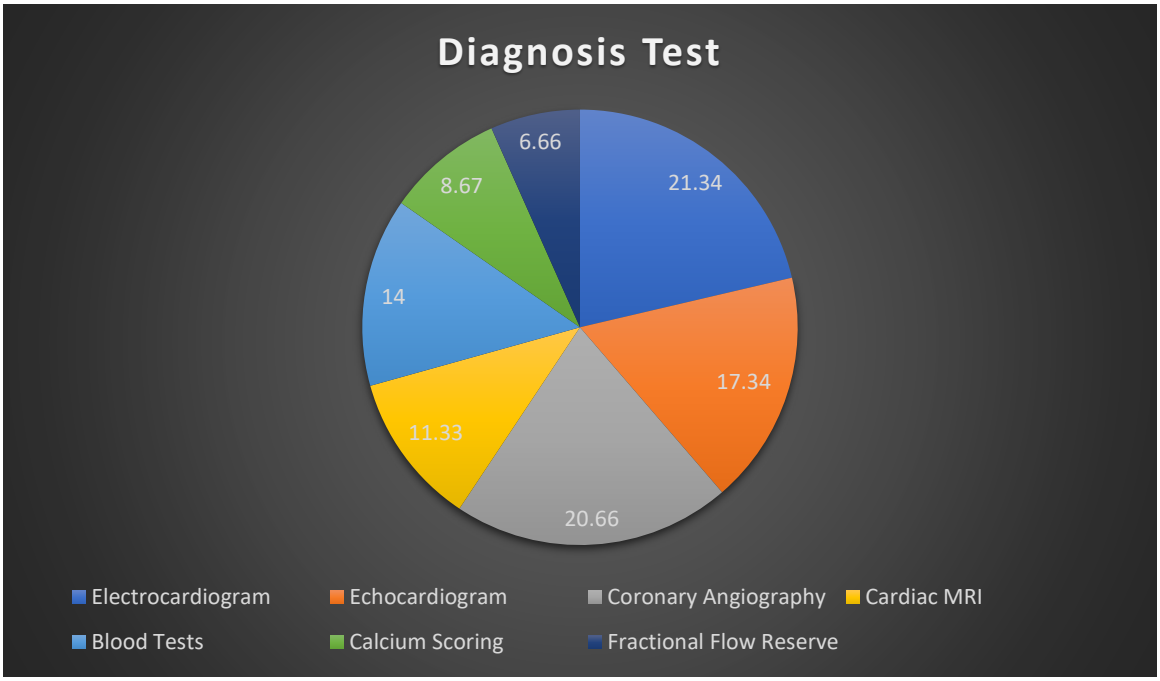

Figure: 5.5 Pie chart of Diagnosis Test

5.6 Symptoms analysis

Symptoms	Number of patient (N=150)	Percentage (%)
Chest Pain	82	54.67
Shortness of Breath	36	24
Fatigue	7	4.66
Heart Palpitations	16	10.67
Dizziness	9	6

Table: 5.6 Symptoms analysis

- The most common sign of coronary heart disease, if we analyze the symptoms, is chest pain. Fatigue came in last with 4.66% of the vote, followed by chest pain at 54.67 percent.

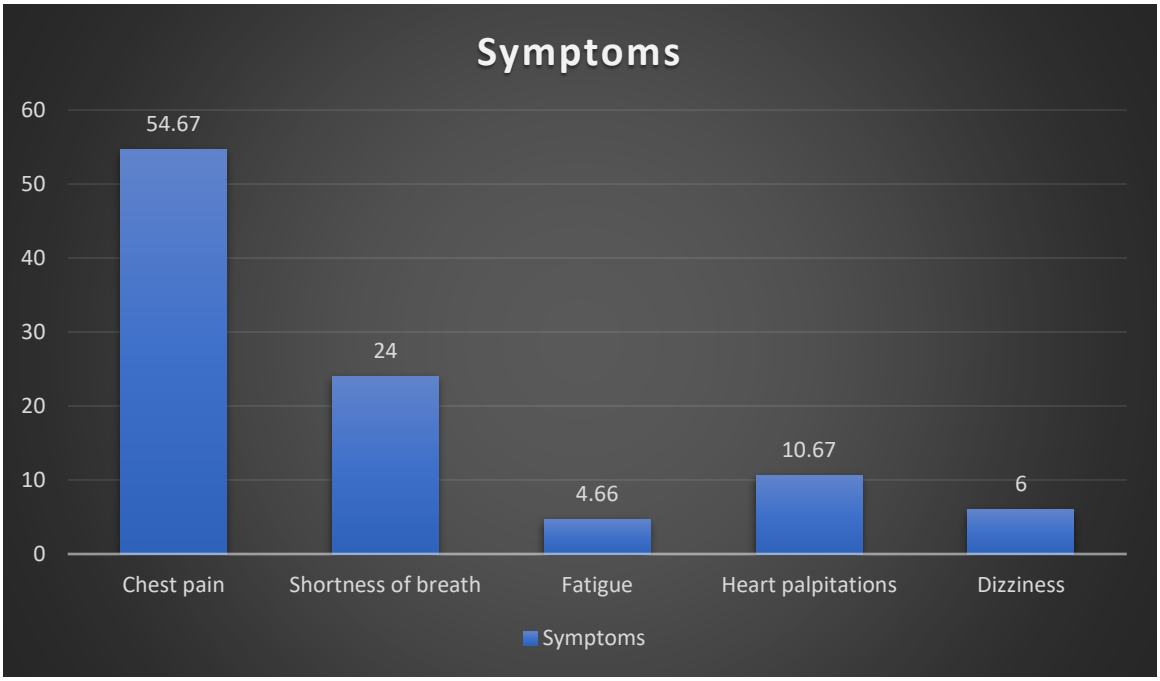

Figure: 5.6 Column chart of Symptoms analysis

5.7 Diabetic Type

Type	Number of patient (N=150)	Percentage (%)
Type I	23	15.33
Type II	127	84.67

Table: 5.7 Diabetic type

- The patient under investigation had diabetes, which contributed to the viral cause of coronary heart disease. Approximately 84.67% of the 150 patients with prescriptions had Type II diabetes.

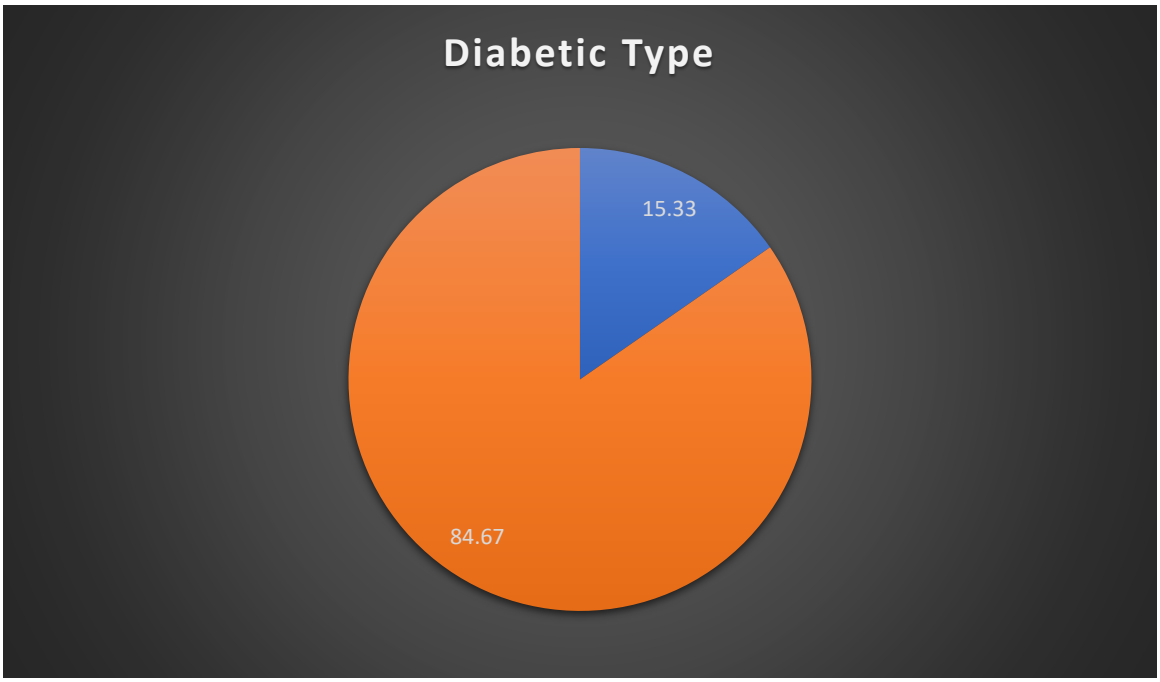

Figure: 5.7 Pie Chart of Diabetic Type

Chapter Six

Conclusion

6. Conclusion

This study's main emphasis is coronary heart disease from a clinical perspective, which might be crucial for Bangladesh's safe and efficient medication delivery system. This study comprised a detailed analysis of the prevalence of coronary heart disease and the local medication market. According to this study, men between the ages of 45 and 49 make up the bulk of patients with coronary heart disease. It also shows that combinations of medications are administered rather than just one kind of medication. Most electrocardiogram uses are in diagnostic procedures. The majority of people have type II diabetes. Bangladesh's health system will benefit somewhat from this research, but it will require careful and effective pharmaceutical use.

Chapter Seven

Reference

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