



Daffodil
International
University

Project On

A Survey on “coronary artery disease” Treatment in Bangladesh

Submitted To

The Department of Pharmacy,
Faculty of Allied Health Sciences,
Daffodil International University

In the partial fulfillment of the requirements for the degree of Bachelor of Pharmacy

Submitted By

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Batch: 21th

Department of Pharmacy
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May-2023

APPROVAL

The Department of Pharmacy in the Faculty of Allied Health Sciences at Daffodil International University has accepted the project entitled "A Survey on Coronary Artery Disease Treatment in Bangladesh" as satisfactory work towards completion of the requirements for the Bachelor of Pharmacy degree.

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Disclosure in Partial Fulfilment of the Requirements for the Degree of Bachelor of Pharmacy (B. Pharm) I hereby declare that I am conducting this project study under the direction of "Ms. Farhana israt Jahan," Associate Professor, Department of Pharmacy, Faculty of Allied Health Sciences, Daffodil International University. I hereby claim ownership of this work. I also confirm that this project has not been submitted elsewhere for credit towards a bachelor's degree or any other degree.

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ACKNOWLEDGEMENT

Allah has blessed me with the perfect health and prosperity to carry out my assignment. I'd want to give a big shout out to Professor Dr. Muniruddin Ahamed, Head of the Department of Pharmacy at Daffodil International University, for making sure I had everything I needed to conduct this study.

I'd want to publicly express my gratitude to Professor Dr. Md. Bellal Hossain, Dean (In-Charge) of DIU's School of Allied Health Sciences, for his consistent support and guidance.

My thanks also go out to Ms. Farhana Israt Jahan, Associate Professor in the Pharmacy Department at DIU, who served as my research supervisor. I owe her a great debt of gratitude for the time and effort she put into imparting her knowledge and wisdom to me.

I'd want to express my gratitude to everyone on the faculty of the Department for all their hard work and support. I appreciate my parents' never-ending cheerleading, help, and focus.

I'd want to publicly express my appreciation to everyone who has helped make this project a success, whether they worked on it directly or not.

Al Rezowan Shoron

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DEDICATION

I dedicate this work to my parents and my teachers and my friends.

Abstract

Coronary heart disease occurs when an accumulation of fatty substances in the coronary arteries obstructs or interrupts the blood flow to the heart. The arterial walls may eventually accumulate fatty deposits. The purpose of this research was to examine the treatment options for coronary artery disease in Bangladesh. The research was conducted through a survey of prescriptions. This investigation compiled a database of 190 coronary artery disease patients. Antiplatelet pharmaceuticals (60%), anticoagulants (20%), vasodilators (10%), and a combination of all three classes (10%) are the classes of drugs used to treat coronary artery disease (CAD) in Bangladesh, according to this study. Bangladesh has the highest incidence of CVD risk factors among South Asian countries. In Bangladesh, 99.6% of men and 97.9% of women are exposed to one or more known cardiovascular disease (CVD) risk factors.

Keywords: Coronary, Heart, Disease, Medication, Anticoagulant, Vasodilator.

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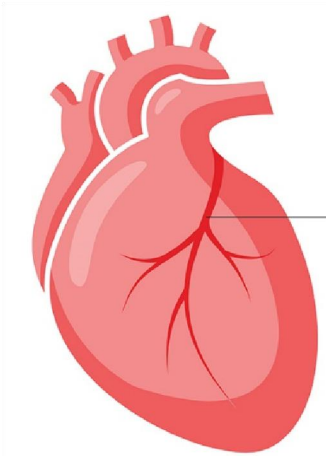
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Chapter One: Introduction

1.1. Introduction

The coronary circulation is made up of the coronary arteries. Their major responsibility is to provide the cardiac muscle with oxygen-rich blood. Similar to all other cells and organs, the heart needs a constant supply of oxygen to function properly and maintain life. [1] An artery network that wraps around the heart from top to bottom is known as the coronary circulation. The two major branches (RCA) are the left coronary artery (or LCA) and the right coronary artery. The classification of arteries may also be based on the heart chambers they supply with oxygenated blood. The microvasculature is the layer of the heart that is the deepest, while the epicardium is the layer that is closest to the endocardium, the heart's innermost tissue. [2] The coronary arteries may become blocked or damaged, allowing less blood and oxygen to reach the heart. This has an impact on the heart's ability to circulate blood throughout the body and has a direct bearing on blood flow to the heart muscle. Therefore, a person may have major health consequences from coronary artery disease or dysfunction, such as angina, a heart attack, or even death. This is accurate since the coronary arteries are what provide the heart with oxygenated blood. [3] **Structure**

As may be seen in the image under "Coronary artery flow," the coronary arteries are composed principally of the left and right coronary arteries, each of which throws out several branches. The coronary arteries supply the coronary chambers of the heart with blood.

- ✓ Aorta
- ✓ The left coronary artery (LCA)
- ✓ Artery of the left anterior descending
- ✓ Circumflex artery on the left
- ✓ Artery of the posterior descending
- ✓ The intermediate artery, often known as the ramus,
- ✓ The right coronary chamber artery (RCA)
- ✓ Artery along the right border of the body descending posterior arterial vein, The left coronary artery (LCA), which runs through the left side of the heart, carries blood. It joins the aorta near the left cusp of the aortic valve. This channel gives rise to the left circumflex and left anterior descending arteries. The anterior wall of the left ventricle as well as the interventricular septum are both supplied by the left anterior descending artery. The left

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circumflex artery supplies blood to the left ventricle's free wall. The posterior descending artery, which provides blood to the inferior and posterior walls of the left ventricle, was formed in around one-third of people by the left coronary artery [4]. There is an additional branch called the ramus or intermediate artery that may sometimes arise at the bifurcation of the left anterior descending and left circumflex arteries. [5] Blood is supplied to the right side of the heart through the RCA, which emerges from the aortic valve's right cusp. Blood enters the atrium of the heart through the right coronary sulcus. In around 67% of people, the RCA divides into the right marginal arteries and then the posterior descending artery. While the left ventricle is fed by the left ventricular posterior artery, which feeds the left ventricle's inferior and posterior walls, the right ventricle is supplied by the right marginal arteries and the posterior descending artery. The CONUS artery, which is present in roughly 45% of people, provides collateral blood flow to the heart when the left anterior descending artery is obstructed. The left anterior descending artery is the source of this blockage. [6-7]

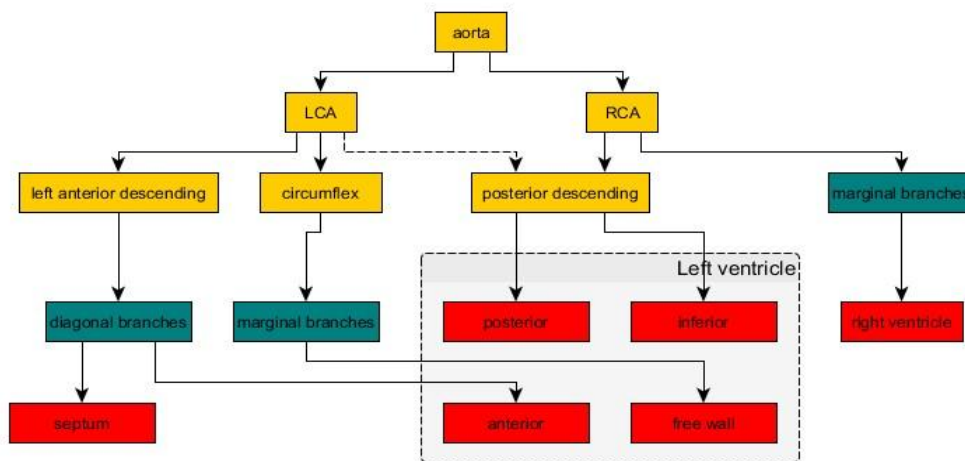


Fig 01: Coronary artery flow

1.2. Coronary artery disease

Coronary artery disease, coronary heart disease, ischemic heart disease, myocardial ischemia, and heart disease all refer to the constriction of coronary arteries due to atherosclerotic plaque. [8] This is the most common heart issue. Stable angina, unstable angina, myocardial infarction, and abrupt cardiac death [9, 10]. Symptoms include chest pain or discomfort in the shoulder, arm, back, neck, or jaw. It may cause heartburn. Exertion and stress are major causes, and the symptoms normally last just a few minutes. Shortness of breath is another sign. Heart attacks are often the first symptom. Causes cardiac failure or irregular heartbeat. Cigarette smoking, inadequate exercise, excess body fat, high cholesterol, a poor diet, mental health disorders, and excessive alcohol use increase risk. [11] heart disease may be diagnosed by an ECG, stress test, coronary CT angiography (CTA), and coronary angiogram (CAG). A good diet, frequent exercise, a healthy weight, and avoiding smoking may reduce your risk of coronary artery disease. Hypertension, cholesterol, and diabetes are sometimes treated. Low-risk, symptom-free people are seldom investigated due to a lack of evidence. [12] Treatment uses the same tactics as prevention. Aspirin, antiplatelet drugs, beta-blockers, and nitroglycerin may be prescribed. [13]. Advanced illness treatments include CABG and PCI (PCI). [14] Unknown whether combining PCI or CABG to additional therapies improves survival or reduces heart attack risk in stable CAD patients. [15] CAD killed 8.9 million of 110 million people globally in 2015. WHO forecasts 15.6% world mortality. Between 1980 and 2010, all age groups' CAD death risk reduced. [16] Between those years, CAD diagnoses fell. [17] 20% of Americans 65 and older, 7% of those 45 to 64, and 1.3% of those 18 to 45 had CAD in 2010. Men of the same age had increased heart disease. [18]

1.3. What are the symptoms of coronary artery disease?

Coronary artery disease may not present any signs for quite some time. The effects of CAD might be felt for quite some time. To fully develop, plaque might take years or even decades. Nonetheless, you may feel some little pain as arterial constriction progresses. These signs indicate your heart is working harder to pump oxygen-rich blood throughout your body.

The following are some of the symptoms of chronic CAD:

Stable angina is the most frequent form of the disease. With angina stabilization, the chest pain or discomfort is brief and repeats at regular intervals. It's more likely to come to your attention when you're doing something physically demanding or emotionally taxing. You may get rid of it with sleep or nitroglycerin (medicine that treats angina).

Dyspnea, often known as shortness of breath, is a condition that affects certain individuals when they engage in even little physical exercise. In some cases, the first sign of coronary artery disease is a heart attack. The following are some of the symptoms of a heart attack:

- a) Ache or discomfort in the chest (angina). The symptoms of angina may vary from a mere annoyance to serious agony. It might feel like heaviness, tightness, pressure, hurting, burning, numbness, fullness, squeezing, or dull pain. It could also feel like any of those things together. The arm, neck, back, or jaw may all start to hurt as the pain spreads through your body.
- b) Experiencing difficulty breathing or shortness of breath.
- c) Having sensations of lightheadedness or dizziness.
- d) Uneasy and rapid heartbeats
- e) Feeling exhausted.
- f) Nausea, pain in the stomach, or vomiting may occur. It's possible that you're experiencing indigestion.
- g) Weakness.

Women and individuals who have AFAB have an increased risk of having extra unusual symptoms, which might include the following:

- a) Before the heart attack, the patient was experiencing shortness of breath, weariness, and sleeplessness.
- b) They may be experiencing discomfort in their back, shoulders, neck, arms, or bellies. c) The chest tightens up.
- d) Sensations of heat or being flushed. [19-20]

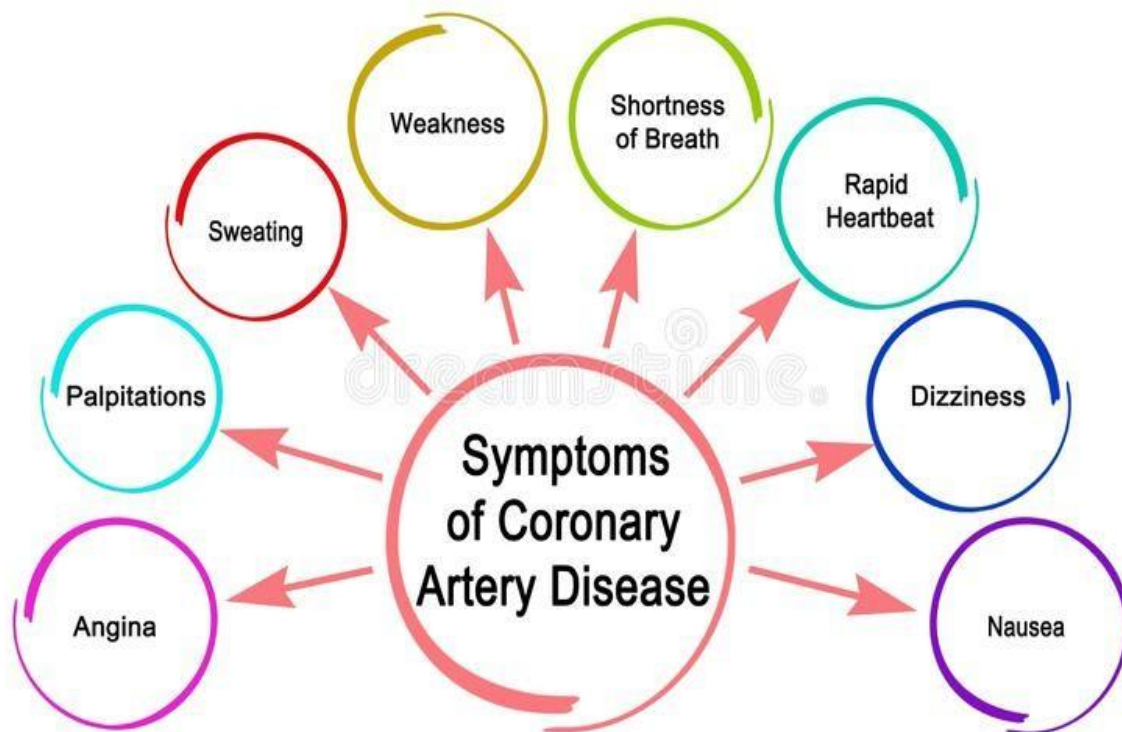


Fig 02: Symptoms of coronary artery disease

1.4. What causes coronary artery disease?

The narrowing of the arteries of the heart is caused by atherosclerosis. Plaque in the arteries gradually builds up over time, which eventually leads to atherosclerosis. Plaque buildup in the coronary arteries may lead to coronary artery disease, which occurs when there is a decrease in the amount of blood that is able to flow to the heart. The majority of the components that make up plaque include cholesterol, waste products, calcium, and fibrin (a substance that helps your blood clot). Plaque in the arteries may have many impacts, including restricting the flow of blood and hardening the artery walls. If plaque builds up in the arteries and they get blocked or damaged, blood flow to a particular portion of the body may become reduced or even cease totally. Plaque buildup in the coronary arteries causes a reduction in blood flow, which is detrimental to the heart muscle. Because of this, your heart will not be able to get the blood, nutrients, and oxygen it requires in order to function effectively. Myocardial ischemia is the

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designation given to this illness by the medical community. This may result in pain in the chest, known medically as angina, and eventually a heart attack. Plaque buildup in the coronary arteries is often a prelude to the development of more extensive atherosclerosis throughout the body. The fact that this may result in issues such as atherosclerosis and the constriction of the arteries in the neck is a source of concern.

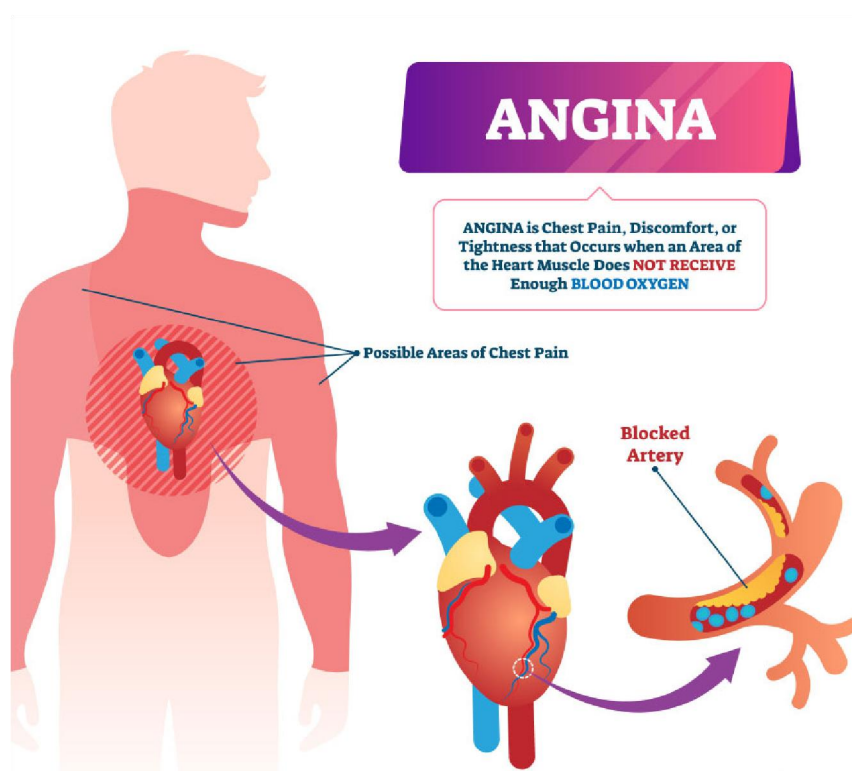


Fig 03: Angina

1.5. What are the risk factors for coronary artery disease?

A variety of factors might increase your likelihood of developing coronary artery disease. Some things are outside your sphere of influence. The rest could be manageable with a combination of lifestyle changes and medication. Make an appointment with your doctor to talk about the risks you face and how you might reduce them. [21]

Risk factors you can't control (non-modifiable risk factors)

Age: In most cases, the risk of getting CAD rises as one gets older. Men and AMAB people are at greater risk after the age of 45. Women and AFAB people are at a higher risk beyond the age of 55.

Family history: If someone in your immediate family has heart disease, your risk is increased. Finding out whether they have heart disease at a young age is crucial. This indicates that they received a diagnosis at a very early age (father or brother before age 55, mother or sister before age 65).[22]

Lifestyle factors that raise your risk

- A diet that is heavy in processed carbs and/or saturated fat.
- A lack of participation in physical activities.
- Sleep deprivation.
- The use of cigarettes, e-cigarettes, or any other kind of tobacco.

Cardiovascular conditions that raise your risk

- Atherosclerosis.
- High blood pressure.
- High LDL (“bad”) cholesterol.
- High triglycerides (hypertriglyceridemia).

Other medical conditions that raise your risk

- Anemia.
- Autoimmune diseases, including lupus and rheumatoid arthritis.
- Chronic kidney disease.
- Diabetes.
- HIV/AIDS.
- Metabolic syndrome.
- Overweight/obesity.
- Sleep disorders like sleep apnea.

Risk factors that affect women and people assigned female at birth

- Acute menopause (before age 40).

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- Endometriosis.
- A history of eclampsia, preeclampsia, or gestational diabetes.
- Using birth control hormones.[23-25]

Atherosclerosis

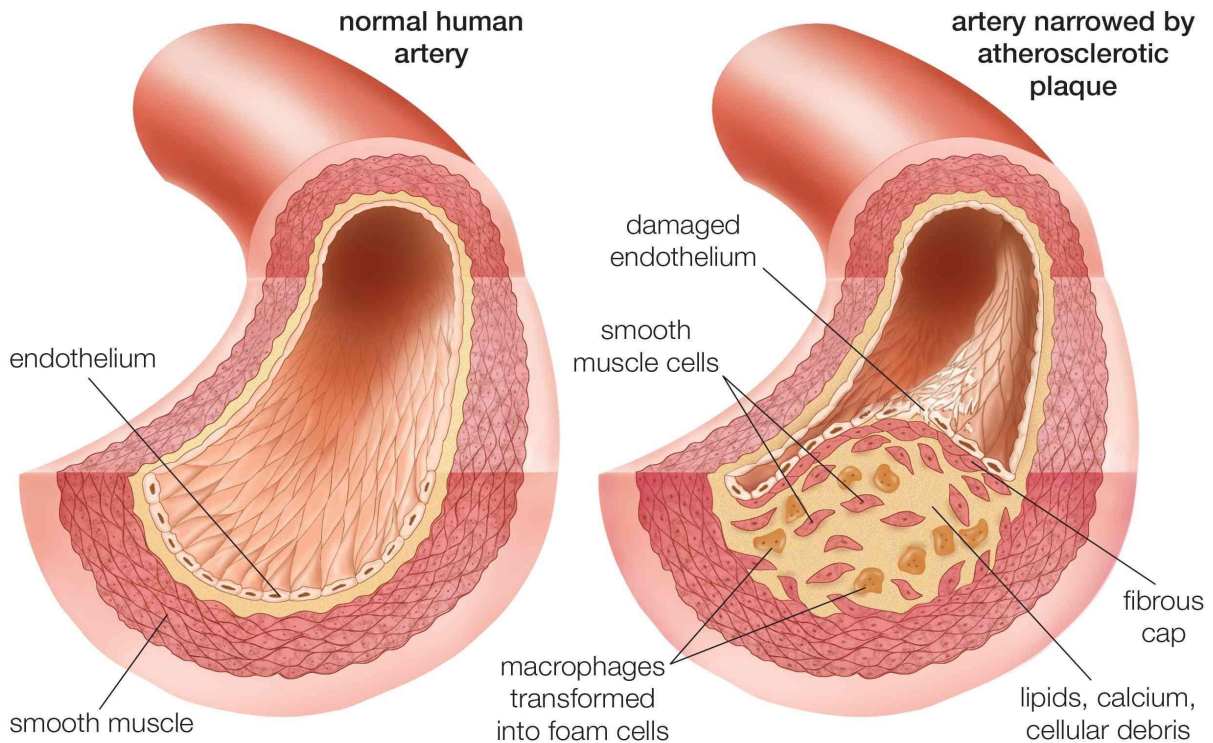


Fig 04: Atherosclerosis.

1.6. How is coronary artery disease diagnosed?

Coronary artery disease is diagnosed by a series of tests and a medical examination.

There are a few things your doctor will do during a physical examination of you:

- ✓ Your health may depend on it, so take a read. ✓ Put a stethoscope on your heart and listen to it. ✓ They will want to know what symptoms you're having and for how long.
- ✓ You should be asked about your health background.
- ✓ Discover how you spend your free time.
- ✓ I'd want to know more about your ancestry if that's okay with you. Whether or not you or any of your relatives have heart disease is something they will want to know.

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- ✓ Your doctor will use this data to calculate your individual risk for cardiovascular disease.[26]

Tests that help diagnose coronary artery disease.

If your doctor suspects coronary artery disease (CAD), he or she may also suggest a cardiac evaluation. To name a few of them:

Blood tests: The risk of developing CAD may be assessed by testing blood for certain chemicals.

Cardiac catheterization: Inserting catheters into your coronary arteries, often known as cardiac catheterization, allows doctors to diagnose or rule out coronary artery disease. For detecting coronary artery disease, no other test compares to this one.

Computed tomography (CT) coronary angiogram: An CT coronary angiography is a CT scan of the heart combined with contrast dye to provide real-time, three-dimensional images of the beating heart. Finds narrowing's in your heart's arteries.

Coronary calcium scan: Examines the quantity of calcium in the coronary artery walls (coronary calcium scan) (a sign of atherosclerosis). This doesn't tell you whether you have major blockages, but it does tell you if you're at risk for coronary artery disease.

Echocardiogram (echo): The structure and function of your heart may be assessed using an echocardiogram (echo).

Electrocardiogram (EKG/ECG): The electrical activity of the heart may be recorded using an electrocardiogram (EKG or ECG). Cardiac attacks, ischemia, and irregular heart rhythms may all be detected.

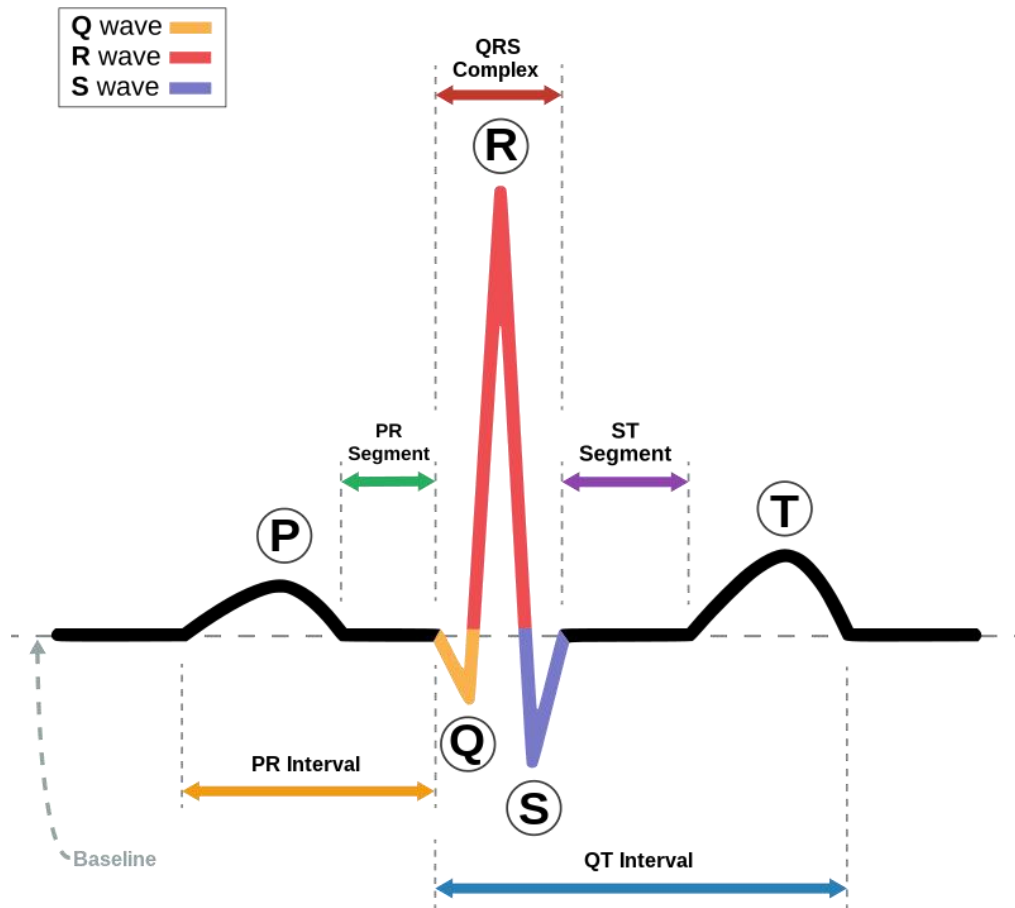


Fig 05: Electrocardiogram

Exercise stress test: The purpose of an exercise stress test is to measure the heart's reaction to physical exertion. Capable of diagnosing heart conditions, including angina and coronary artery disease. [27-28]

1.7. Pathophysiology

Ischemia occurs when the heart's muscle cells do not get enough oxygen, as a result of a decrease in blood flow to the heart. Medical professionals refer to the cell death in the heart muscle caused by a lack of oxygen as myocardial infarction (commonly referred to as a heart attack). The heart muscle gets injured, dies, and becomes scarred as a consequence, yet the damaged muscle cannot repair itself. Temporary ischemia caused by persistent high-grade constriction of the coronary

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arteries may induce a ventricular arrhythmia, which in turn can progress to ventricular fibrillation, a potentially fatal heart rhythm. [29] Development of atherosclerosis inside a segment of the typically smooth and elastic lining that borders the coronary arteries is the most common cause of coronary artery disease (the blood vessels that provide blood to the heart muscle). The inner lining of an artery becomes hard and stiff due to atherosclerosis, and a plaque is formed from fatty lipid deposits, abnormal inflammatory cells, and calcium deposits. Deposits of calcium phosphate, sometimes called hydroxyapatite, are suspected of playing a significant role in atherosclerosis and the initiation of coronary atherosclerosis's early stage. The vascular smooth muscle is rich with these deposits. As an example, chronic renal failure and hemodialysis are both possible manifestations of a disorder known as a metastatic mechanism of calciphylaxis. Roughly half of these individuals with renal impairment still die from coronary artery disease. When plaques form in an artery, it's like having a large hump or pimple that protrudes into the artery's channel and partially blocks the blood flow. Some people with coronary artery disease have just a few of plaques in their arteries, whereas others may have hundreds. When a coronary artery stays completely blocked for more than three months, a more severe form of the disorder known as chronic total occlusion (CTO) develops. [30] Symptoms of cardiac syndrome X include chest pain (sometimes called angina pectoris) and discomfort in the chest. People with these symptoms get normal results on an angiography (coronary angiogram), which indicates that there are no blockages in the larger coronary arteries of the heart. [31] The specific origin of heart disease X is still a mystery. Possible causes include microvascular dysfunction and epicardial atherosclerosis. [32-33] However, hormones and other risk factors that are unique to women may have a role in the development of the illness, which is more common in women than in men for reasons that are not totally understood. [34]

1.8. Epidemiology

With more than 7 million deaths as of 2010, coronary artery disease was the leading cause of death worldwide. This figure increased from the 5.2 million CAD-related deaths that occurred worldwide in 1990. [35] CTE may appear in individuals of any age, but as people age, it becomes much more likely to do so, with the risk virtually doubling for each decade that passes in a person's life. Men are more likely than women to have the illness, on average. [36] Although South Asia only makes up 20% of the global population, it is predicted that the South Asian peninsula would be responsible for 60% of the worldwide burden of cardiovascular disease. It's

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possible that a combination of genetic predisposition and environmental factors led to this. Many organizations, like the World Heart Federation, which includes the Indian Heart Association, are working to raise awareness about this issue. [37] The leading cause of death for both men and women in the United States, coronary artery disease kills close to 600,000 people every year. In the near future, one in three healthy 40-year-old females and one-half of all healthy 40-year-old males in the United States may develop coronary artery disease, according to present trends. Regardless of gender, it is the biggest cause of mortality for Americans aged 20 or older in the country. [40]

1.9. Coronary artery disease types

The three varieties of coronary heart disease are as follows:

1. Obstructive coronary artery disease.
2. Nonobstructive coronary artery disease.
3. Spontaneous coronary artery dissection.

About Obstructive Coronary Artery Disease

The blood-supplying arteries progressively narrow or shut due to the condition known as obstructive coronary artery disease. The formation of plaque, known as atherosclerosis, which often results in this blockage, may begin as early as your teen years and develop more slowly in some people than in others. The flow of oxygen-rich blood that the heart muscle needs may be restricted or even stopped if the blockage gets severe enough. Sometimes a blockage might occur abruptly. A heart attack is this situation, which need urgent medical attention. Occlusive coronary artery disease (occlusive CAD) is commonly referred to as coronary heart disease (CHD), a term that may also apply to various illnesses. CHD is the leading factor in death in both men and women. Despite the fact that men are more likely to suffer a heart attack, women are more likely to pass away from one.

About Non-Obstructive Coronary Artery Disease

Nonobstructive coronary artery disease does not result in the constriction or obstruction of arteries by atherosclerotic plaque as the obstructive kind does. As a consequence, the arteries start to face a variety of problems, including endothelial dysfunction (weak inner linings), coronary vasospasm (incorrect constriction), microvascular dysfunction (problems with tiny

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branches), and squeezing from the surrounding heart muscle (myocardial bridging). Nonobstructive illnesses may nonetheless cause the signs and symptoms of obstructive sickness. At least one out of every five individuals who have a coronary angiography report having clear arteries but yet experiencing chest pain. Nonobstructive illnesses may affect males too, although they tend to affect women more often. Additional research is required to validate the risk factors, underlying causes, and appropriate diagnostic techniques since it offers a diagnostic challenge.

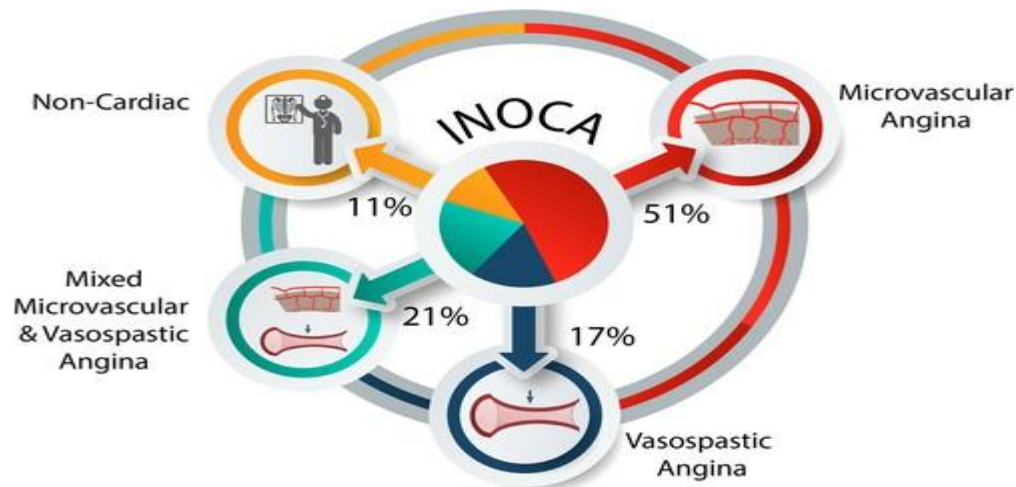


Fig 06: Nonobstructive Coronary Artery Disease

About Spontaneous coronary artery dissection

When a rip forms in one of the blood arteries in the heart, a disorder known as spontaneous coronary artery dissection (commonly abbreviated as SCAD) occurs. This might endanger your life. CAD may reduce or stop blood supply to the heart entirely, which may cause a heart attack, irregular heartbeats (arrhythmias), or even sudden death. SCAD may affect both sexes at any age, however it more often affects women in their 40s and 50s than guys of any age or gender. Patients with SCAD often do not have additional cardiovascular disease risk factors, such as high blood pressure, high cholesterol, or diabetes. SCAD may cause an unexpected death if it is not promptly diagnosed and treated. If you encounter any of the heart attack warning symptoms, even if you don't think you're at risk, you should get to the hospital right away.

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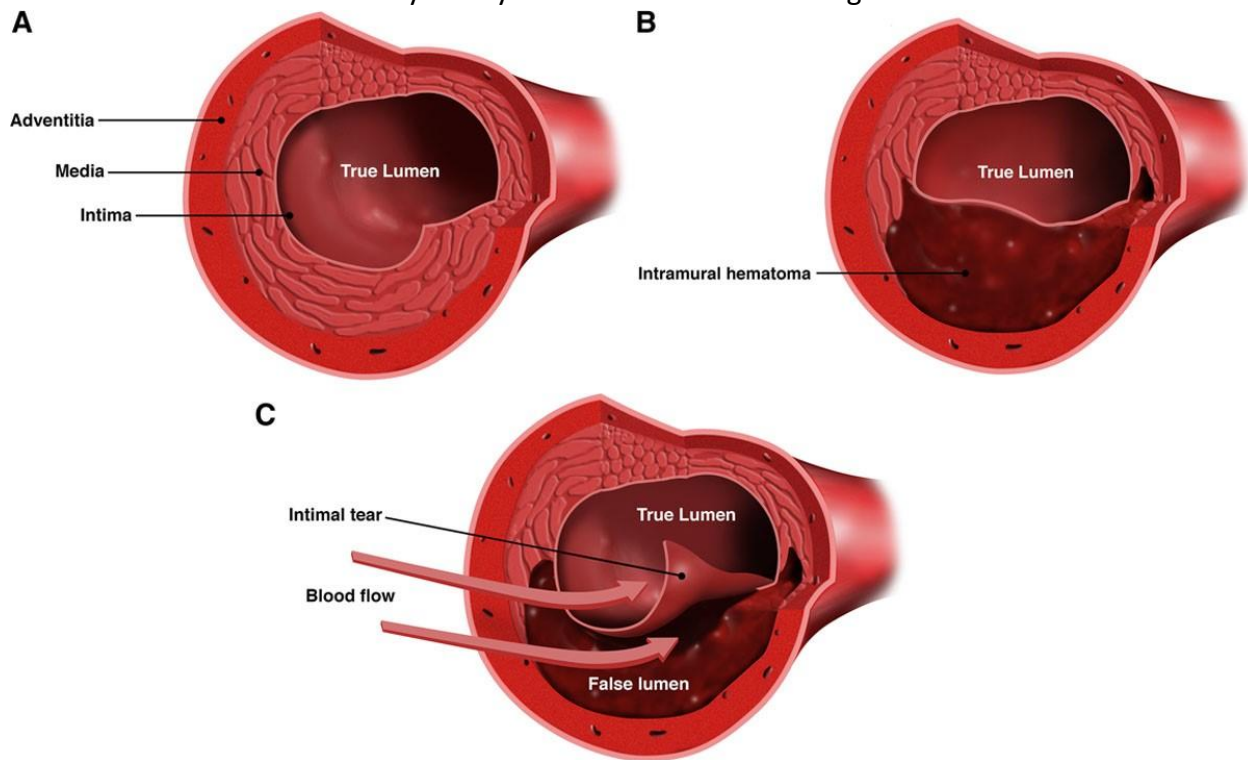


Fig 07: Spontaneous coronary artery dissection

1.10. Prevention

It is feasible to reduce the risk of acquiring cardiovascular disease by up to 90% if individuals can avoid common risk factors. Regular physical exercise, weight reduction, hypertension management, blood cholesterol control, and quitting smoking are all examples of effective preventive interventions. Both medication and exercise have similar effects. [41] Vigorous exercise has been linked to a 25% decrease in the risk of coronary heart disease. The eight pillars of a healthy lifestyle are essential for establishing and maintaining cardiovascular wellbeing, according to the American Heart Association. Sleep was included as an AHA factor that influences heart health in 2022. The importance of using these two preventive steps is emphasized in many suggestions. A 2015 Cochrane Review found that high-risk people may benefit from counseling and education to encourage behavioral change. However, there was insufficient information to draw any conclusions on mortality or actual cardiovascular events. Better sugar control may prevent problems including blindness and kidney failure, but there is limited proof that it may lessen cardiac risk in those with diabetes mellitus. The World Health

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Organization (WHO) recommends "low to moderate alcohol consumption" to reduce the risk of coronary artery disease, but a high intake increases the risk. [43]

Diet

Diets high in fruits and vegetables have been related to lower incidence of cardiovascular disease and death. The fact that vegetarians have a lower risk of heart disease than non-vegetarians may be due to the fact that they eat more fruits and vegetables [44]. A high-fiber diet, like the Mediterranean diet, has been proven to possibly lower the risk. Many hydrogenated foods, including margarine, contain trans-fat, which has been linked to a condition that raises the risk of coronary artery disease and atherosclerosis. Omega-3 fatty acid supplementation does not seem to protect against cardiovascular disease (including myocardial infarction and sudden cardiac death). Menaquinone (Vitamin K2) consumption has been linked to a lower risk of cardiovascular disease mortality, but not phylloquinone (Vitamin K1). [45]

Secondary prevention

Limiting the spread of a disease after it has already taken hold is known as secondary prevention.

Incorporating the following into your daily routine may have a significant ✓ Adhere to

a nutritious diet and get regular exercise to keep your weight in check. ✓ In order to kick the habit of smoking

✓ Avoiding foods that contain trans fats in your diet (in partially hydrogenated oils)

✓ Alleviating the Effects of Emotional and Social Strain ✓ Exercise

Aerobic exercise, such as walking, jogging, or swimming, may reduce the chance of dying from coronary artery disease. It has been shown that aerobic exercise lowers blood pressure and LDL cholesterol. HDL, a healthy cholesterol, is also increased. (A more trustworthy source is needed.) Despite the advantages of exercise, there is significant disagreement about whether doctors should spend time encouraging their patients to engage in it. However, it "did not assess the evidence regarding the effectiveness of physical activity to decrease chronic illness, morbidity, and mortality," instead concentrating solely on the efficacy of counseling. The USPSTF did find "insufficient evidence" to suggest that clinicians advise patients to engage in exercise. Based on anecdotal data, the American Heart Association recommends exercise coaching to patients. After cardiac incidents, a variety of psychological therapy may be offered. Despite the fact that

psychological symptoms are common among people with CHD, there is no evidence that they enhance outcomes like mortality, revascularization rates, or the number of people who suffer a non-fatal myocardial infarction. [46]

Antibiotics for secondary prevention of coronary heart disease

Patients with coronary disease may benefit from antibiotic use in lowering their threat of cardiac arrest and cerebrovascular accidents. On the other hand, recent research indicates that antibiotics used for secondary prevention of coronary heart disease may actually increase the risk of death and stroke. Thus, antibiotics are not recommended for reducing the risk of developing secondary coronary heart disease.[47]

Neuropsychological Assessment

A CHD disease is associated with impaired brain function in women, according to a comprehensive systematic evaluation of the available evidence. Therefore, persons with CHD should have a neuropsychological evaluation since there is mounting evidence linking cardiovascular disorders like CHD to the onset of dementias like Alzheimer's.[48]

1.11. What is the treatment for coronary artery disease?

Changes in lifestyle, control of risk factors, and medication are often used in the treatment of coronary artery disease (CAD). In addition, treatment or operation could be beneficial for some individuals. Your doctor or other medical professional will discuss the optimal treatment strategy for you. It is essential to stick to the treatment plan that your doctor has given you to reduce the likelihood that you may have major consequences as a result of CAD.[49]

Lifestyle changes

Managing coronary artery disease (CAD) sometimes requires making modifications to one's lifestyle. These modifications include the following:

- Do not smoke, vape, or use any other product that contains tobacco.
- Consume a diet that is minimal in salt, saturated fat, trans fat, and sugar in order to keep your heart healthy. The Mediterranean diet has been shown to reduce the risk of cardiovascular disease, including heart attack and stroke.

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- To stay fit, try to walk for at least half an hour five days a week, or find other things that you love doing.
- Limit alcohol.
- Before beginning any new workout regimen, you should be sure to consult with your physician first. Your provider may also be able to provide you advice on adjusting your lifestyle to better suit your requirements. Your healthcare physician may suggest that you schedule an appointment with a nutritionist to discuss healthy eating plans and choices for quitting smoking.[50]

Risk factor management

The course of your condition may be slowed down by controlling your CAD risk factors. Manage the following circumstances in conjunction with your provider:

- Diabetes.
- Both high blood pressure and high cholesterol levels.
- Obesity.
- Triglycerides that are too high (hypertriglyceridemia).
- Overweight/obesity.

Medications

You may use medications to both control your risk factors and treat the signs and symptoms of coronary artery disease. One or more of the drugs on the following list may be recommended by your doctor.

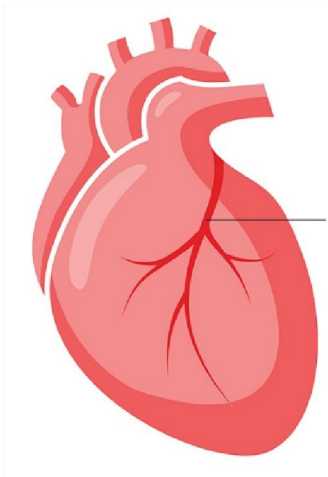
- ✓ Prescription drugs for lowering blood pressure. ✓ Prescription drugs to decrease cholesterol. ✓ Drugs to treat stable angina. These include ranolazine and nitroglycerin.
- ✓ Drugs that lower the risk of blood clots.[51]

Procedures and surgeries

Some people need a procedure or surgery to manage coronary artery disease, including: Coronary angioplasty is another term for percutaneous coronary intervention or PCI. It does very little damage. Your doctor will use a tiny balloon for popping your blocked artery back open and

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improve blood flow through it. In order to keep your artery open, your doctor could possibly implant a stent. Coronary artery bypass grafting (CABG): This procedure reroutes your blood's course around obstructions. Your heart's blood flow is restored by this "detour." People with significant blockages in several coronary arteries benefit from CABG.[52]



Chapter Two: Literature Review

Literature Review:

2.1. Mirza, A., Aslam, S., Perrin, K., Curtis, T., Stenback, J., Gipson, J., & Alrabaa, S. (2016).

Knowledge, attitudes and practices among patients with coronary artery disease in Dhaka, Bangladesh. *Int J Community Med Public Health*, 3(10), 2740-2748.

When compared to other Southeast Asian nations, Bangladesh has the greatest risk factor for the leading cause of mortality globally, cardiovascular disease. Due to a variety of socioeconomic factors, those with lower incomes are less likely to be informed about CAD. In order to collect baseline information for preventive programs, it is necessary to evaluate CAD-related knowledge and perception. This cross-sectional study polled 222 individuals in Bangladesh on their KAP in regard to coronary artery disease (CAD). Systematic random sampling was used to collect data for the KAP's 40-item survey from a government cardiology hospital in Dhaka, Bangladesh, which is representative of the city's low-income population. Scores ranged from 0 to 40 on the KAP, with a mean of 21.455.83. In fact, only 5.86% of the sample showed very high levels of competence. Although males were more knowledgeable ($t(1.962) = 1.334, P=0.051$), women showed a greater tendency to seek medical attention when ill ($t(-2.135) = -0.407, P=0.034$). There were many statistically significant chi-square correlations between SES and KAP scores. Low socioeconomic-status patients in Bangladesh were shown to have certain gaps in their knowledge, attitude, and practice about coronary artery disease. The gaps in KAP shown by this research should be the focus of future preventive educational initiatives.

2.2. Islam, A. M., Mohibullah, A. K. M., & Paul, T. (2016). Cardiovascular disease in Bangladesh: a review. *Bangladesh Heart Journal*, 31(2), 80-99.

Increases in the prevalence of CVD are being seen around the globe, including in Bangladesh. Epidemiological shifts over the last several decades have shifted the United States' illness burden from mostly communicable to primarily non-communicable diseases, with cardiovascular disease playing a major role in this shift. The prevalence of cardiovascular disease (CVD) is steadily rising, especially amongst those with CAD. While the incidence of acute rheumatic fever is decreasing, the incidence of hypertension and heart failure is increasing. Despite these efforts, there is still a lack of sufficient data on many areas of CVD. Depending on the source, estimates place the current rates of hypertension (20-25%), coronary artery disease (CAD) (4-6%),

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rheumatic fever (1/1000), and rheumatic heart disease and stroke (0.3-1.0%) at, respectively, 25-55%, 1/1000, 0.3-1.0%, and 1/1000, respectively. Genetic predisposition, excessive salt consumption, arsenicosis, hypovitaminosis D, and air pollution may all play significant roles in the aetiopathogenesis of CVD in this group, in addition to the traditional risk factors for various CVD. Policy formulation and a focus on prevention might be useful in Bangladesh's fight against cardiovascular disease.

2.3. Hypertension Study Group. (2001). Prevalence, awareness, treatment, and control of hypertension among the elderly in Bangladesh and India: a multicentre study. Bulletin of the World Health Organization, 79(6), 490.

The goal of this study is to assess the level of hypertension in the older populations of Bangladesh and India in terms of prevalence, level of knowledge about the disease, therapy, and level of control. Using a multistage cluster sampling method, 1203 senior people (670 women; mean age, 70 years) were recruited from two locations in Bangladesh and three sites in India. Hypertension was found to be prevalent in 65% of adults (95% confidence range = 62-67%; WHO-International Society of Hypertension criteria). More people were affected in cities than in rural regions, although there was no substantial difference in incidence between the sexes. Increased body mass index, greater levels of education, and the presence of diabetes mellitus were all shown to be significant predictors of hypertension prevalence in multiple logistic regression studies. Hypertension incidence was shown to be lower in populations that were more physically active, had a lower proportion of rural residents, and had lower rates of current smokers. Only 10% of the study population with hypertension met the US Sixth Joint National Committee on Detection, Evaluation, and Treatment of Hypertension (JNC VI)/World Health Organization criteria, despite the fact that 45% knew they had the disease and 40% were receiving anti-hypertensive medication. Three significant factors were shown to be associated with hypertension awareness: having seen a doctor in the last year, having a higher level of education, and being female.

Their research highlights the need to implement cost-efficient treatment regimens based on absolute levels of cardiovascular risk that are reasonable in the current economic climate. Public health experts agree that lowering the average blood pressure of the population is the only longterm solution to the epidemic of hypertension plaguing the Indian subcontinent.

2.4. Muhit, M. A., Rahman, M. O., Raihan, S. Z., Asaduzzaman, M., Akbar, M. A., Sharmin, N., & Faroque, A. B. M. (2012). Cardiovascular disease prevalence and prescription patterns at a tertiary level hospital in Bangladesh. Journal of Applied Pharmaceutical Science, (Issue), 80-84.

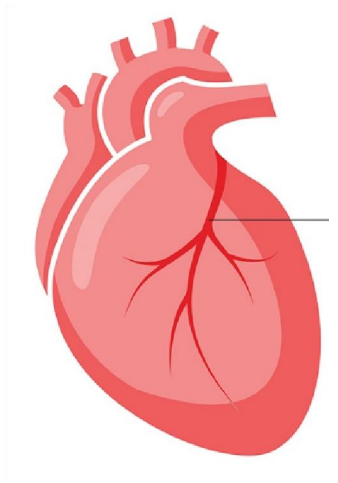
The evaluation of CVD management is based on the demographic research of CVDs and medication consumption in the population. The purpose of this research was to examine the present trends and medication consumption rates for the treatment of cardiovascular diseases in Bangladesh. Between July'09 and August'09, researchers at the National Institute of Cardiovascular Diseases (NICVD) in Dhaka conducted a cross-sectional descriptive study in the institute's outdoor setting. Seven hundred eighty patients who met the inclusion and exclusion criteria were questioned using a standardized questionnaire, and their prescriptions were monitored. Around half (54.9%) of all patients were 55 or older, and about two-thirds (69.62%) of all patients were city dwellers. Patients were diagnosed with diabetes in 40.39 percent of cases, hypertension in 28.05 percent, heart failure in 27.25 percent, ischemic heart disease in 21.55 percent, and lipid level problems in 47.05 percent. Antiatherogenic medications (97.67%), lipidlowering agents (95.35%), antianginal pharmaceuticals (79.07%), beta-blockers (51.16%), ACE inhibitors (30.23%), diuretics (37.21%), anxiolytics (81.4%), etc. were the most often prescribed drugs. General practitioners may find this information useful for maximizing the reasonable use of cardiovascular medicines and for developing a plan for optimal treatment of cardiovascular disease.

2.5. Ranjan, R., Adhikary, D., Mandal, S., Seedher, A., & Adhikary, A. B. (2017). The outcome of coronary endarterectomy with coronary artery bypass grafting in patients with diffuse coronary artery disease in Bangladesh: A retrospective cohort study. JRSM Cardiovascular Disease, 6, 2048004017732658.

This study was conducted with the intention of analyzing the outcomes of a single surgeon's practice of performing coronary endarterectomy in conjunction with coronary artery bypass grafting on patients suffering from diffuse coronary artery disease. In this retrospective study, the outcomes of one thousand patients with diffuse coronary artery disease who underwent coronary endarterectomy with off-pump coronary artery bypass grafting between the years 2009 and 2016 were examined. 615 years was the age that was considered to be the norm. Coronary

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endarterectomy was performed on a total of 74.7% of patients in the left coronary territory (43.2% left anterior descending, 26.6% diagonal, and 4.9% obtuse marginal), and on 25.3% of patients in the right coronary territory. After surgery, the intensive care unit had an overall mortality rate of 1.9%, with 11 patients passing away after it was too late. The average length of stay in the intensive care unit was 36.6 hours (standard deviation: 6.7 hours). Patients were finally allowed to have their tubes removed after a mean and standard deviation of 9.8 and 1.25 hours. Patients remained in the hospital for a mean total of ten days and one day on average throughout their treatment. Overall, the survival rates were rather high: 97.8% after one year, and 89.5% after five years. However, when the patients were followed for a median of 2.5 years after their first treatment, 91.8% of them were still angina-free. When all other alternatives for successfully revascularizing patients who have coronary artery disease have been exhausted, coronary endarterectomy with off-pump coronary artery bypass grafting is an option that is both practical and effective. This surgical revascularization procedure may be performed.



Chapter Three: Goal of my studies

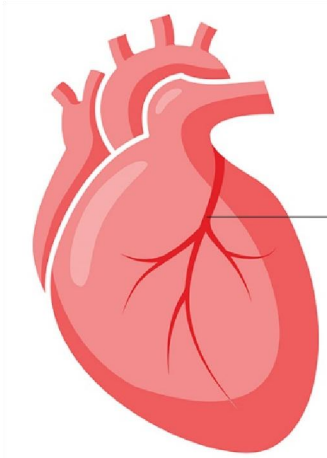
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The goal of my studies:

The disease of the Coronary Arteries Plaque accumulation in the walls of the arteries supplying blood to the heart is the primary cause of coronary artery disease (called coronary arteries). Cholesterol deposits are what makeup plaque. Over time, arteries' interiors gradually constrict due to plaque formation. The term "atherosclerosis" refers to this process.

My aim of this study was:

- To know the coronary artery disease condition in Bangladesh.
- To see the available treatment of coronary artery disease condition in Bangladesh.
- To see which aged people are mostly affected by coronary artery disease condition in Bangladesh.
- To see the main cause of coronary artery disease condition in Bangladesh.
- T see which area people are mostly affected by coronary artery disease condition in Bangladesh.
- T open new aria in higher studies.



Chapter Four: Materials and Method

4.1. Introduction:

The study was conducted through a prescription survey. I made a survey of 120 CAD patients & found 78 patients have CAD.

4.2. Research Design:

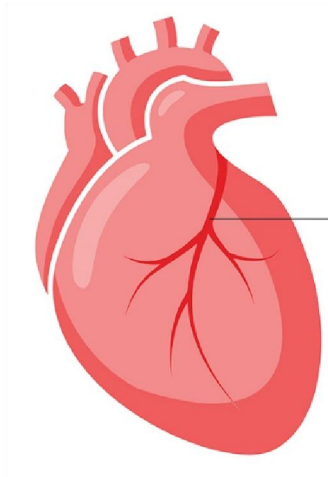
This service was done physically. All prescriptions were collected from "National Heart Foundation Hospital."

4.3. Method of Data Analysis:

After gathering various data, each piece was examined for accuracy and internal coherence to rule out any missing or inconsistent parts, which were then deleted. Information research was conducted using Microsoft's popular updated version.

4.4. Ethical Considerations

Before beginning the information assortment, educated verbal permission was taken from the investigation members. The respondents' identities were kept secret, and participants in the research were informed that they might drop out at any point throughout the information-gathering process. The Department of Pharmacy supported the investigation.



Chapter Five: Result and Discussion

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5.1. Gender:

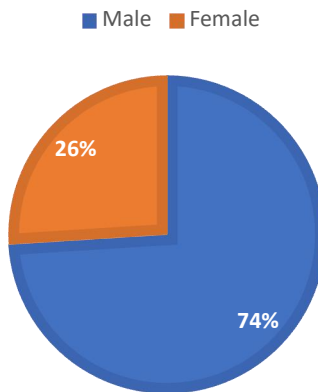


Fig 08: Gender

Gender	Patient	Percentage
Male	58	74%
Female	20	26%

About 26% of the survey's respondents are female, while 74% are male; all are diagnosed with coronary artery disease.

5.2. Age

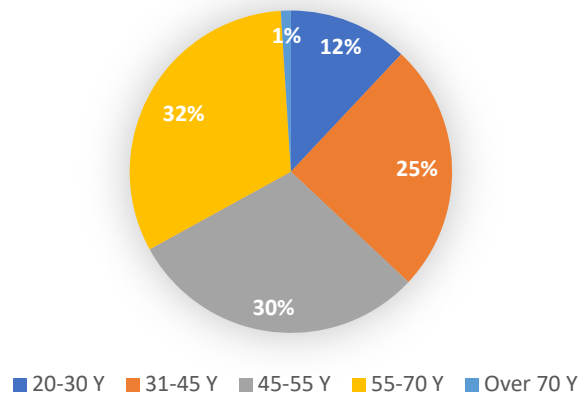


Fig 09: Age

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Age	Patient	Percentage %
20-30	10	12%
31-45	20	25%
45-55	23	30%
55-70	25	32%
Over 70	1	1%

In this survey, 12% of participants are under the age of 20-30, 25% are between the ages of 31 and 45, 32% are between the ages of 55 and 70, 30% are between the ages of 45 and 55, and the lowest percentage is for those over the age of 70.

5.3. History of Hypertension

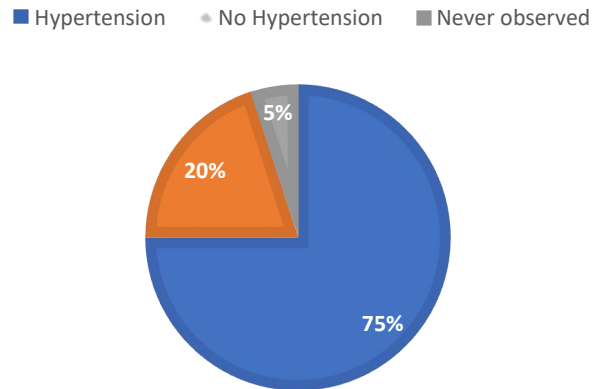


Fig 10: History of Hypertension

History	Number of patients	Percentage%
Hypertension	59	75%
No-Hypertension	16	20%
Never observed	4	5%

Renal failure, CAD, and stroke may all be caused by hypertension, which is a significant independent risk factor. In that survey, around 75% of the patients had a history of hypertension, whereas 20% had none, and 5% had never noticed it.

5.4. History of Smoking

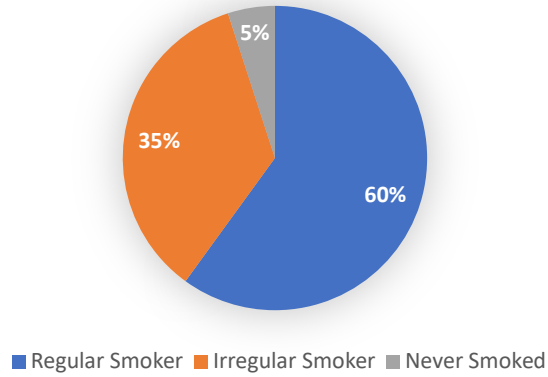


Fig 11: History of Smoking

History of smoking	Patient	Percentage
Regular	46	60%
Irregular	28	35%
Never Smoked	4	5%

In this survey around 60% participants are regular smoker and 35% participants are irregular smoker and remaining 5% participants are never smoked any tobacco products. **5.5. Primary signs and symptoms reported by patients**

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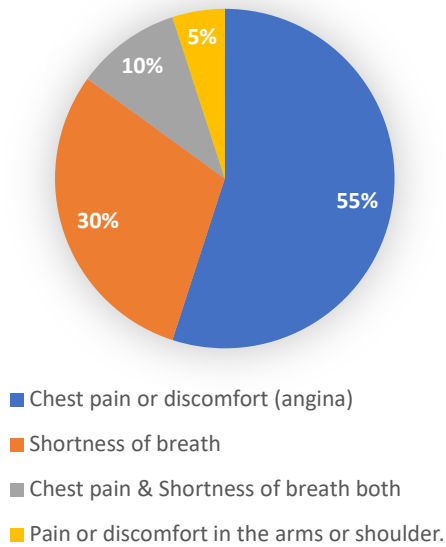


Fig 12: Primary signs and symptoms reported by patients.

Signs & Symptoms	Patient	Percentage
Chest Pain	42	55%
Shortness of breath	23	30%
Chest pain & Shortness of breath both	8	10%
Pain or discomfortable in the arms or shoulder	4	5%

In this study, the most common signs and symptoms that patients described were chest pain in 55% of cases, shortness of breath in 30% of cases, chest pain plus shortness of breath in 10% of cases, and pain or discomfort in the arms or shoulders in 5% of cases.

5.6. Class of medication used in Bangladesh to treat CAD

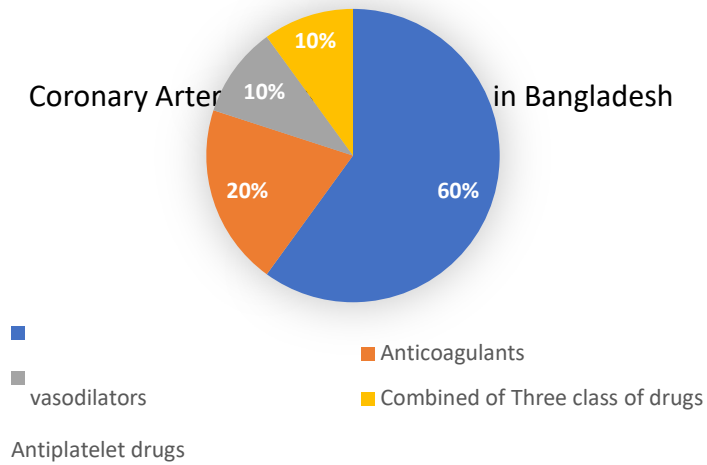
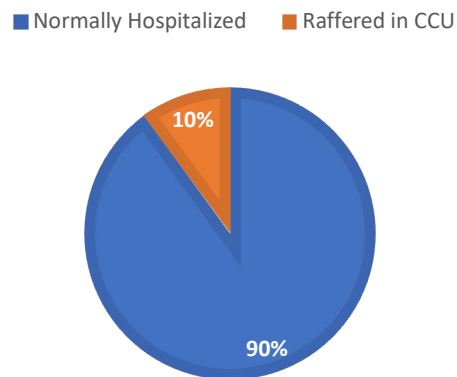


Fig 13: Class of medication used in Bangladesh to treat CAD.

Class of medication	Patient	Percentage
Antiplatelet drugs	46	60%
Anticoagulants	16	20%
Vasodilators	8	10%
Combined of these class of drugs	8	10%

In this study, the classes of medications used to treat coronary artery disease (CAD) in Bangladesh include antiplatelet pharmaceuticals (60%) anticoagulants (20%) vasodilators (10%) and a combination of all three classes (10%).

5.7. Patient referred for CAD in CCU



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Fig 14: Patient referred for CAD in CCU

Patient referred	Patient	Percentage
Normally Hospitalized	70	90%
Referred in CCU	8	10%

Around 90% of the survey participants' patients were hospitalized but were soon released, while another 10% had serious conditions and were admitted to the CCU unit.

5.8. Name of some prescribe regular drugs for CAD patients

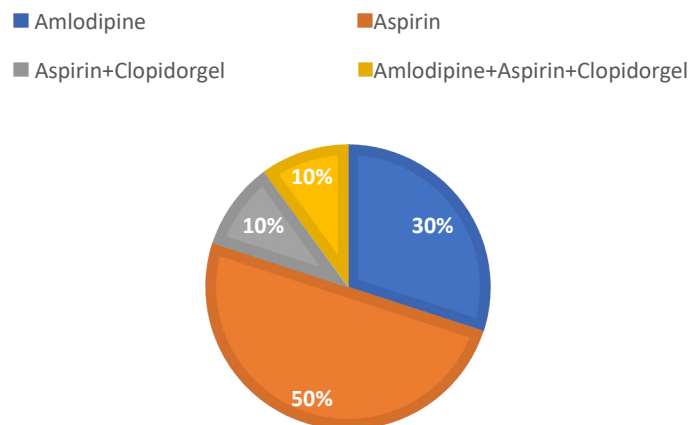


Fig 15: Name of some prescribe regular drugs for CAD patients.

Prescribed Medicine	Patient	Percentage
Aspirin	39	50%
Amlodipine	23	30%
Aspirin+Clopidorgel	8	10%
Amlodipine+Aspirin+Clopidorgel	8	10%

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Aspirin has prescribed around 50% of prescriptions, Amlodipine has prescribed 30% of prescriptions, Aspirin+Clopidorgel has prescribed 10% of prescriptions, Amlodipine, Aspirin, Clopidorgel both has prescribed 10% of prescription.

5.9. Common lipid lowering drugs prescribed for CAD patients

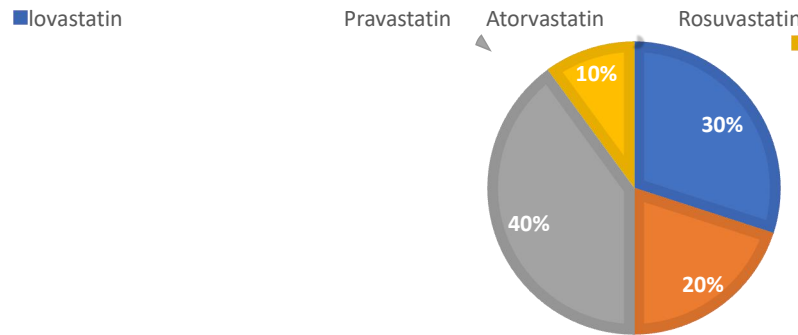


Fig 16: Common lipid lowering drugs prescribed for CAD patients.

Lipid-lowering Medicine	Patient	Percentage
Atorvastatin	31	40%
Lovastatin	23	30%
Pravastatin	16	20%
Rosuvastatin	8	10%

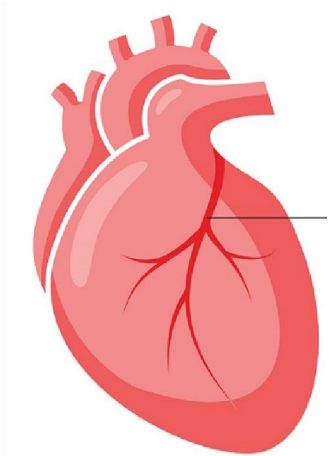
Treatment for coronary artery disease involves the use of lipid-lowering medications (CAD). Around 40% of patients received Atorvastatin prescriptions, 30% received Lovastatin prescriptions, 20% received Pravastatin prescriptions, and 10% received Rosuvastatin prescriptions in certain prescriptions.

5.10. What people thought about coronary artery disease

30% of people believe coronary artery disease is a disease similar to heart attack; another 60% of people have no idea about this disease; 10% of people don't take it seriously; however, the

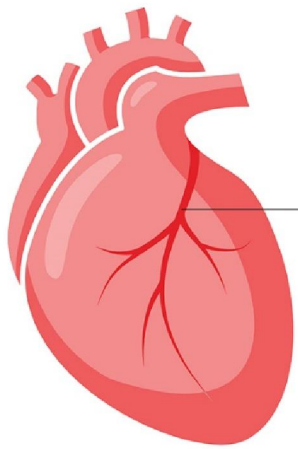
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majority of people are concerned about this disease. most people have no idea what is coronary artery disease is.



Chapter Six: Conclusion

An uncommon cause of sudden myocardial infarction known as spontaneous coronary artery dissection (SCAD) is the non-traumatic, non-iatrogenic separation of the coronary arterial wall. Women and younger adults are more likely to run into it. According to this study, the three pharmacological classes most often used to treat coronary artery disease (CAD) in Bangladesh are antiplatelet medications (60%) anticoagulants (20%) vasodilators (10%), and a combination of all three (10%).



Chapter Seven: Reference

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