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Incidence of Myocardial Infarction among Urban and Rural Populations in the Prizren Region

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Abstract

Introduction - Myocardial infarction, commonly known as a heart attack, is a disease of the blood vessels supplying the heart muscle (myocardium), essentially coronary heart disease. Myocardial infarction remains the leading cause of death worldwide. Although the risk of suffering a myocardial infarction increases with age, the incidence of myocardial infarction has progressively risen over time, even among younger patients (under 45 years old).

The primary aim of this study is to identify and inform about the incidence of myocardial infarction among urban and rural populations in the Prizren region, as well as the role of nurses in the care, treatment, and counseling of patients, their families, and caregivers towards normalizing or socializing these patients within society and their environment.

Methodology - For this study, a retrospective research method was employed, utilizing data extracted from the archives of the Regional Hospital of Prizren, specifically from the Cardiology Clinic, where cases of myocardial infarction were recorded. The research was conducted over a one-year period in 2023.

Results - During 2023, a total of 97 cases of myocardial infarction were presented for treatment at the Cardiology Clinic in Prizren. Males accounted for 73% of cases, with the most affected age group being those over 70 years, comprising 44% of cases. Additionally, cases originating from rural areas dominated, making up 60% of presentations.

Conclusions - The study data indicate that the likelihood of experiencing a myocardial infarction and other cardiovascular diseases increases with age. Myocardial infarction is a serious health condition that requires specialized treatment and continuous medical care. Prompt and accurate medical attention can help minimize damage and restore heart health. In such cases, it is essential for individuals to follow medical advice and undergo regular monitoring to ensure full recovery and well-being.

Keywords – Myocardial Infarction, Patients, Care, Treatment, Physical Activity.

I. INTRODUCTION

Myocardial infarction (MI), commonly referred to in layman's terms as a heart attack, is most often caused by a decrease or cessation of blood flow to a part of the heart, leading to necrosis of the heart muscle. This is generally the result of a blood clot in the epicardial artery supplying that territory of heart muscle. Depending on how myocardial infarction is defined, not all cases necessarily require an etiological blood clot. In all living tissues, including heart muscle, blood supply must meet the muscle's oxygen demands (Saleh & Ambrose, 2018).

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MI, known colloquially as a heart attack, refers to the disease of the blood vessels that supply the heart muscle (myocardium), meaning coronary heart disease. The area of heart muscle that has zero or such a minimal blood flow that it cannot maintain muscle function is said to be infarcted, and the overall process is termed myocardial infarction. There are two types of MI: transmural and subendocardial. It is primarily caused by oxidative stress and atherosclerosis. Chest pain is the most common symptom of acute MI and is often described as a feeling of tightness, pressure, or squeezing. Other symptoms include diaphoresis (excessive sweating), dyspnea, weakness, dizziness, nausea, vomiting, and palpitations. The most common symptoms of MI in women include dyspnea, weakness and fatigue, and sleep disturbances. Treatment may involve the use of blockers, diuretics, ACE inhibitors, calcium channel blockers, and nitrates (Singh & Jat, 2022).

Myocardial infarction is also a clinical diagnosis based on the presence of symptoms or signs of myocardial ischemia in relation to acute myocardial damage, as indicated by an increase or decrease in concentrations of cardiac biomarkers. Myocardial infarction can result from several different pathophysiological mechanisms. Type 1 myocardial infarction occurs in individuals with rupture and thrombosis of an atherosclerotic plaque, whereas type 2 myocardial infarction occurs due to an imbalance of myocardial oxygen supply and demand in the context of an acute illness causing tachyarrhythmia and hypotension without acute atherothrombosis (Wereski et al., 2022).

Myocardial infarction remains the leading cause of death worldwide. Although the risk of suffering a myocardial infarction increases with age, the incidence of myocardial infarction has progressively risen over time, even among younger patients (under 45 years old). Previously, there had been little focus on the diagnosis, management, and prevention of myocardial infarction in young individuals, considering the low prevalence of this disease. However, it remains a significant cause of morbidity and mortality among young individuals globally, and studies have shown that the percentage of younger patients with MI has steadily increased over the years (Krittanawong et al., 2023).

Additionally, bleeding poses a challenge in managing cardiovascular diseases. Acute blood loss often leads to the interruption of clinically indicated antithrombotic therapies and can provoke a systemic prothrombotic response. Patients who survive acute bleeding are at increased risk for subsequent thrombotic complications, including acute myocardial infarction. When myocardial infarction occurs in the setting of preceding bleeding, concerns regarding subsequent bleeding may influence the intensity and duration of antithrombotic therapy guided by protocols and decisions regarding coronary revascularization (Rubinfeld et al., 2022).

Myocardial infarction is classified into two types:

ST-segment elevation myocardial infarction (STEMI)

Non-ST-segment elevation myocardial infarction (NSTEMI)

STEMI occurs when there is a complete blockage of a coronary artery, resulting in a significant amount of damage to the heart muscle. This type of MI is usually accompanied by ST-segment elevation on an electrocardiogram (ECG) and is considered a medical emergency. Treatment typically involves rapid reperfusion with medication or a mechanical intervention, such as percutaneous coronary intervention or thrombolytic therapy.

NSTEMI, on the other hand, occurs when there is a partial blockage of a coronary artery, resulting in less damage to the heart muscle compared to STEMI. This type of MI is usually associated with non-ST-segment elevation on an ECG and may not require urgent reperfusion therapy. Treatment may include medications, such as antiplatelet and anticoagulant drugs, along with a conservative approach to revascularization (Mishra et al., 2023).

II. LITERATURE REVIEW

Epidemiology

Robust epidemiological data on the incidence of myocardial infarction (MI) is challenging to find, but synthesis of data from multiple sources suggests that the average hospital in the United Kingdom (UK) is expected to admit approximately two patients with a first MI and one with a recurrent MI for every 1,000 inhabitants annually. Most patients will develop heart failure or

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significant left ventricular systolic dysfunction at some point following an MI, most often during the index admission. Up to 20% of these cases will be transient, but such patients still have a poor prognosis (Cleland, Torabi, & Khan, 2005).

According to 2014 data from a national self-reported survey in the UK, the prevalence of MI was reported as 640,000 in men and 275,000 in women, representing approximately 915,000 people who have experienced an MI in the UK. In 2013, the prevalence of MI in men was approximately three times higher than in women in the UK. Age-specific prevalence of MI ranged from 0.06% in men under 45 years to 2.46% in those under 75 years. Unlike these developed countries, South Asian countries (India, Pakistan, Sri Lanka, Bangladesh, and Nepal) have the highest prevalence of MI in individuals younger than 45 compared to those older than 60. The incidence of MI has been declining in developed countries, including the US and the UK (Jayaraj, Davatyan, Subramanian, & Priya, 2018).

MI is the leading cause of death worldwide. Although the global mortality rate associated with MI has overall decreased, the incidence of heart failure remains high. The mortality and morbidity rates are elevated in heart failure related to MI. Heart failure has detrimental impacts on the healthcare systems in the United States, affecting 6 million individuals and causing 300,000 deaths annually. An overall increase in the prevalence of cardiovascular risk factors contributes to this, particularly diabetes, cholesterol, and obesity, as well as smoking. In patients with MI under 55 years old, smoking was identified as a unique cardiovascular risk factor in 80% of cases (Salari et al., 2023).

In Japan, patients diagnosed with acute myocardial infarction were included based on the universal definition from the European Society of Cardiology/American College of Cardiology Committee in 2000. The study calculated the incidence rate based on the population of Tokyo for 51,639 patients hospitalized in 72 hospitals in the Tokyo area, which included about 95% of total patients in the region.

The age-standardized incidence of hospital admissions for myocardial infarction in South Korea for 2016 was calculated to be 43.2 cases per 100,000 inhabitants, indicating that there were 25,531 cases that year, corresponding to approximately one new case every 20 minutes, or about 70 cases per day. The incidence of hospital admissions for acute myocardial infarction per 100,000 inhabitants steadily decreased from 53.6 cases in 2007 to 38.9 in 2011, and began to increase again after 2011, reaching 43.2 in 2016. However, this increase is unlikely to have been a direct result of rising disease incidence. Rather, patients who would have previously been diagnosed with unstable angina were diagnosed with non-ST-segment elevation myocardial infarction after presenting with high-sensitivity troponin analysis (Kim, Kim, & Hwang, 2022).

Clinical Overview

The most common symptoms of myocardial infarction (MI) include pain or discomfort felt in the center of the chest, radiating to the arms, particularly the left shoulder, the elbows, the jaw, or the back; shortness of breath; nausea or vomiting; and lightheadedness. "The prognosis is favorable in MI when reperfusion is sought immediately after the onset of symptoms. Immediate presentation for medical care can drastically reduce mortality and morbidity associated with patient delay." Patient delay refers to the time from the onset of symptoms to seeking medical help. In global surveys, the majority of the population recognizes chest pain as the primary symptom of MI. However, there is a lack of awareness regarding other symptoms of MI. Knowledge about atypical presentations of MI and its recognition is lacking in the general population worldwide. Thus, insufficient awareness of heart attack symptoms directly correlates with patient delays and adverse health events (Sharma et al., 2021).

MI symptoms are often described as persistent chest pain, which may radiate to the neck, lower jaw, or left arm. Other symptoms that may occur alongside chest pain or independently include shortness of breath, nausea or vomiting, cold sweats, fatigue, palpitations, syncope, and a general feeling of being unwell. Symptoms can sometimes be vague and may range from persistent to intermittent (Ängerud et al., 2023).

Arrhythmia following myocardial infarction (MI) is a common clinical problem that requires immediate recognition and treatment. The incidence of arrhythmia after MI has declined in the era of reperfusion; however, when present, it can be associated with increased morbidity and mortality. Generally, arrhythmias are more common in patients who do not undergo timely reperfusion, particularly those with depressed left ventricular ejection fraction (Frampton, Ortengren, & Zeitler, 2023).

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Approximately 20% of emergency admissions for chest pain will, in fact, have a myocardial infarction, and there are many other potential causes of chest pain (e.g., gastroesophageal disorders, musculoskeletal pain, anxiety, or stable ischemic heart disease). Current practice for ruling out myocardial infarction involves blood tests taken when the patient first presents to the emergency department, with repeat tests performed after 3-6 hours or 10-12 hours, depending on the assay used. Tests that can quickly identify patients who do not have a myocardial infarction can help avoid unnecessary hospital admissions and alleviate anxiety for many individuals (Westwood et al., 2021).

III. Declaration Of The Problem

The incidence of myocardial infarction (MI) remains the leading cause of death worldwide, with the risk of experiencing a myocardial infarction increasing with age. However, the incidence of MI has progressively risen over time, even among younger patients (<45 years). Moreover, myocardial infarction represents one of the most serious and dangerous cardiovascular diseases, often leading to significant complications.

The localization of pain during a myocardial infarction may vary depending on the part of the heart affected, but it is typically felt in the center of the chest and may radiate to the arms, neck, or legs. Major risk factors for myocardial infarction include hypertension, high cholesterol levels, diabetes, smoking, physical inactivity, family history, obesity, emotional stress, and excessive alcohol and tobacco consumption.

The diagnosis of myocardial infarction involves the use of several tests, including electrocardiograms (EKG), cardiac enzyme analyses, and imaging tests to confirm damage to the heart muscle. These tests help guide the appropriate treatment plan for the patient.

The primary aim of this study is to assess and inform the incidence of myocardial infarction among the urban and rural populations in the Prizren region, as well as the role of nurses in the care, treatment, and counseling of patients and their families or caregivers toward normalizing or socializing these patients within society and their environment.

Objectives:

To determine the frequency of myocardial infarction.

To analyze the gender most affected.

To assess the age distribution of affected individuals.

To evaluate the residential area (urban or rural).

To identify associated comorbidities.

IV. Methodology

To achieve the objectives of this study, a retrospective research method was employed, involving the extraction of data from the archives of the Regional Hospital of Prizren, specifically from the Cardiology Clinic, where cases of myocardial infarction (MI) were documented.

The research focused on a one-year period, specifically the year 2023.

Statistical Processing: During this period, a total of 51 cases of myocardial infarction were treated at the Cardiology Clinic in Prizren. The obtained data were categorized and subjected to statistical analysis using Excel 2021. Data presentation was conducted through tables and graphs to illustrate the findings effectively.

The conclusions drawn from this study aim to identify improved strategies for the prevention, monitoring, and management of myocardial infarction, which is one of the most prevalent diseases affecting a significant portion of our population.

Additionally, a comprehensive review of references, publications, textbooks, and the latest knowledge from online sources was conducted to support and enrich the research findings.

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V. PRESENTATION AND ANALYSIS OF RESULTS

Myocardial infarction (MI) is a condition that occurs when a portion of the heart muscle (myocardium) is damaged or dies due to a lack of blood and oxygen supply. This typically happens when a coronary artery is blocked, leading to insufficient blood flow to the heart area. This condition can cause chest pain, anxiety, fever, pain in the shoulder or left arm, and may result in serious heart damage if not treated promptly.

In our analysis by gender, it is evident that males are significantly more affected, with 71 cases (73%), compared to females, who accounted for 26 cases (27%).

Table 1. Patients by Gender

Gender	Number of Cases	Percentage (%)
Male	71	73%
Female	26	27%

Graph 1. Patients by Gender

One of the initial manifestations of myocardial infarction (MI) is chest pain, which may be described as a heavy, pressing, or burning sensation in the center of the chest. This pain typically lasts more than a few minutes and may radiate to the shoulder, left arm, back, or neck. It is crucial to seek medical assistance immediately if you experience these symptoms, as time is of the essence in treating MI.

In some cases, patients may also present with additional symptoms such as cold sweats and a feeling of facial heaviness.

The following presents the distribution of patients by age group, which shows the following results:

Age group 41-50 years: 8%

Age group 51-60 years: 12%

Age group 61-70 years: 35%

Age group over 70 years: 44%

Table 2. Patients by Age Group

Age Group	Number of Cases	Percentage
41 – 50 years old	8	8%
51 – 60 years old	12	12%
61 – 70 years old	34	35%
Mbi 70 years old	43	44%
Total	97	100%

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Table 3. Patients by Place of Residence

Place of Residence	Number of Cases	Percentage
Rural Residences	58	60%
Urban Residences	39	40%
Total	97	100%

The diseases that often lead to myocardial infarction include arterial hypertension, diabetes, obesity, and high cholesterol levels in the blood.

Hypertension (high blood pressure) can cause myocardial infarction by increasing the pressure in the arteries that supply blood to the heart. This elevates the risk of plaque formation (a deposit of fat, cholesterol, blood cells, and fibrin that builds up in the walls of the arteries supplying the heart) in the coronary arteries (atherosclerosis), resulting in a blockage and insufficient supply of blood and oxygen to the heart muscle, which can ultimately lead to myocardial infarction.

Diabetes can also cause myocardial infarction due to its effects on blood vessels. High blood sugar levels, which occur in individuals with diabetes, can damage blood vessels and lead to plaque formation in the coronary arteries. This may increase the risk of artery blockage and cause myocardial infarction.

Obesity can lead to myocardial infarction due to the high levels of fats and inflammation associated with obesity, which can damage blood vessels and increase the risk of plaque formation in the coronary arteries, resulting in myocardial infarction.

Cholesterol can cause myocardial infarction by forming deposits in the coronary arteries. High cholesterol levels can also lead to the accumulation of fat in the blood vessels and block the blood supply to the heart, causing myocardial infarction.

Finally, we have presented patients with comorbidities as follows: patients with obesity constitute the majority at 32%, followed by those with hypertension at 22%, diabetes at 20%, high cholesterol at 7%, and others at 19%.

Table 4. Patients by Comorbidities

Comorbidities	Number of Cases	Percentage
Hypertension	21	22%
Diabetes	19	20%
Obesity	31	32%
Cholesterol	7	7%
Others	19	20%
Total	97	100%

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VI. Conclusions And Recommendations

Conclusions

The data from this study indicate that with increasing age, the likelihood of experiencing myocardial infarction and other cardiovascular diseases also rises. Myocardial infarction is a serious health condition that requires specialized treatment and continuous medical care. Prompt and accurate medical attention can help minimize damage and restore heart health. In such cases, it is essential for individuals to follow their doctor's instructions and to be regularly monitored to ensure complete recovery and well-being.

Our results show that males are more frequently affected by myocardial infarction due to various factors in their biology and lifestyle. Generally, men tend to have a higher risk of developing cardiovascular diseases due to hormonal changes, cholesterol levels, blood pressure, and lifestyle factors such as smoking, lack of physical activity, and unhealthy eating habits. These factors contribute to their elevated risk of myocardial infarction compared to females.

Considering that myocardial infarction occurs when blood flow to a part of the heart is blocked, causing damage to heart muscle due to lack of oxygen, moderate physical activity plays a significant role in preventing cardiac arrest. Additionally, consuming a healthy diet rich in fruits, vegetables, fish, and healthy oils can help maintain cholesterol levels and blood pressure under control. Maintaining a healthy weight and managing obesity can also reduce the risk of myocardial infarction. Monitoring and managing high blood pressure can help prevent heart damage. Smoking is another risk factor; therefore, cessation is crucial in reducing the risk of myocardial infarction.

When treating myocardial infarction, the approach should include pain management, restoration of blood flow to the heart, and minimization of potential damage to the heart muscles. In severe cases, surgical procedures such as coronary bypass may be necessary to restore blood flow. Rapid care and immediate treatment are essential for reducing damage and improving recovery chances. In nursing care and treatment of patients with myocardial infarction, special attention must be given to ensuring a safe environment and aiding their recovery. Nurses should continuously monitor patients' vital signs, such as blood pressure, heart rhythm, and blood oxygen saturation, to identify any signs of potential complications. They are also responsible for administering necessary medications like aspirin, pain relievers, and antiarrhythmic drugs to stabilize the patient's heart. Additionally, nurses should monitor blood flow and ECG to assess heart function and detect any signs of new infarctions.

Patient and family education plays a crucial role in understanding the causes, treatment, and management of myocardial infarction, as well as in promoting healthy lifestyle choices. Patients with myocardial infarction may experience anxiety, stress, and fear. Nurses should provide emotional support and help patients manage their feelings. For patients with myocardial infarction, receiving special care from nurses is paramount for their careful management. Nurses who offer support, security, and a thoughtful approach towards patients with myocardial infarction contribute significantly to their recovery and coping. Patients with myocardial infarction can feel satisfied with their nursing care when they receive specialized attention and a careful approach to ensure they achieve the best possible recovery and feel supported.

Recommendations

After reviewing the literature and analyzing the results, we recommend the following:

- Engage in regular physical exercise, make dietary changes to lower cholesterol and blood pressure, monitor your weight, and quit smoking to protect your heart.
- Find ways to reduce stress in your life, including practicing meditation, breathing exercises, or engaging in activities that help you relax.
- Ensure that you have regular medical check-ups to monitor your cardiac health and prevent the recurrence of heart problems. Care and prevention are essential for maintaining heart health after a myocardial infarction.
- After a myocardial infarction, physical therapy can aid in recovering muscle strength and improving physical exercise capacity.

- Your doctor may recommend medications to manage blood pressure, cholesterol levels, and keep your heart healthy. Ensure that you take medications regularly and according to your doctor's instructions.
- Following a myocardial infarction, emotional support is crucial. Consider seeking help from a psychologist or a support group to assist in managing stress and anxiety. Ongoing care, collaboration with your doctor, and following their recommendations will aid your recovery after a myocardial infarction.
- A healthy and balanced diet is vital for heart health. Consuming fruits, vegetables, whole grains, and low-fat fish while limiting harmful sugars and fats can help keep your heart healthy.
- It is important to have regular medical check-ups to monitor your heart health and prevent potential complications. These recommendations, in conjunction with prescribed medical treatment, can help manage and aid recovery after a myocardial infarction.

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