



PATHOLOGICAL ASPECTS OF SILENT HEART ATTACKS AND THEIR TREATMENT

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ABSTRACT

Silent heart ischemia is a condition characterized by decreased oxygen-rich blood flow in the absence of chest discomfort or other angina symptoms. Silent myocardial infarction (MI) is asymptomatic; it does not cause symptoms like normal myocardial infarction. According to new research, coronary artery disease is common in people with aortic stenosis (AS). Cardiac arrest is a new condition in which a person does not obtain enough oxygen because of an unhealthy lifestyle, dietary habits, cigarette and smoking usage, lack of exercise, sleeping patterns, and other factors that contribute to coronary artery disease. In our research, we acknowledge the pathogenic aspects as well as the diagnostic procedures used to detect myocardial infarction symptoms in our bodies, such as blood tests, CT scans, X-rays, and so on. The death rate in India and other countries is at an all-time high. The therapy is determined by the stage of cardiac arrest, although it is also accomplished with certain preventive medicines and surgical interventions.

KEYWORDS: Silent heart attack, silent heart ischemia, oxygen-rich blood flow, aortic stenosis, pre-diagnosis procedure, treatment, histopathology, cross-section, awareness, risk factors of MI.

INTRODUCTION

A silent heart attack is a condition in which the body does not get enough oxygen into the heart without causing any discomfort, such as in angina or other cardiovascular illnesses. It occurs without any warning signs or symptoms and causes major complications in the patient's life. The University of Nis studied 240 high-risk asymptomatic people and discovered that 15% of asymptomatic subjects had high coronary risk during stress echocardiography, and silent myocardial ischemia was more common than symptomatic myocardial ischemia. Heart failure is classified into four stages of diagnosis: Stage A indicates a high risk of heart failure, while Stage B indicates a cardiac failure that can be detected with an echocardiography. The heart will begin to appear weird at this point. Stage C: This is a normal stage of heart failure in which the patient experiences breathing difficulties, nausea, and edema, but it is treatable. Stage C is also diagnosable and treatable. Stage D: This is the final stage of the subject, which is associated with normal heart failure and necessitates rapid surgery. Our lifestyle, dietary habits, lack of responsibility for frequent check-ups, use of tobacco and alcohol, and other factors are major causes of heart failure. The majority of people disregard the symptoms of a heart attack and delay seeking medical assistance for an extended period of time. On January 23, 2023, the WHO (World Health Organization) published an article in which they indicated that over five billion individuals are unprotected from trans-fat, which leads to heart disease.

Detailed overview of pathological aspects through Blood Test

Most physicians recommend a lipid profile test in the early stages for an individual who is asymptomatic due to heart problems such as pain, nausea, edema, poor digestion, and so on. A lipid profile test can assist in determining the levels of LDL (low-density lipoprotein), often known as bad cholesterol, and HDL (high-density lipoprotein), also known as good cholesterol. Triglycerides are a form of fat found in the bloodstream. According to current research, people with atherosclerotic cardiovascular disease have reduced LDL levels over time. Aspartate aminotransferase, troponin, creatine kinase MB, myoglobin, lactate dehydrogenase, B-type natriuretic peptide, C-reactive protein, myeloperoxidase, and ischemia-modified albumin are the key tests mentioned in cardiac markers that aid in the diagnosis of heart failure. These are intracellular macromolecules that are released from the heart muscle when the heart is injured, resulting in myocardial infarction. heart indicators are solely used to detect heart injury. A cardiac marker is a low-cost, quick, and quantitative diagnostic that can detect problems. In the current scenario, markers and test panels are creatine kinase (CK) and muscle-brain creatine kinase (CK-MB), troponin T (TnT) and troponin I (TnI), and myoglobin (Mb), and the markers under assessment with potential clinical use are CK-MB isoforms, high-sensitivity C-reactive protein (hs-CRP), and B-type (formerly brain) natriuretic peptide (BNP).



Risk Factors

- 1. Smoking:** Smoking can be the main cause of cardiac arrest because the chemicals in cigarette smoke cause swelling and inflammation in the blood vessels that can lead to atherosclerosis, coronary heart disease, stroke, peripheral arterial disease, and abdominal aortic aneurysm. Smokers have higher risks of myocardial infarction as compared to non-smokers, as the odd ratio comes out to be 3.71, which is significant.
- 2. Eating habits:** Diet is crucial in living a healthy life, which is why a damaging diet raises the risk of myocardial infarction. Obesity, high blood pressure, uncontrolled diabetes, and a high-saturated-fat diet are all risk factors for myocardial infarction.
- 3. Consumption of alcohol:** Habituation to heavy alcohol consumption is associated with higher cardiovascular risk. Previous studies have reported that alcohol leads to acute triggers of sudden cardiac death and ischemic and haemorrhagic stroke. However, a higher risk of acute MI-triggered alcohol consumption among people.
- 4. Sleeping pattern:** Inadequate sleep has been identified as a public health epidemic, and poor sleeping habits add to the burden of heart disease, which is linked to an increased risk of MI, inflammation, and endothelial dysfunction. According to prior research, they are vulnerable to reverse causality and residual confounding, which limit causal inference. In Mendelian randomization, these disadvantages are mitigated by the use of genetic polymorphisms as proxies for lifelong exposure to longer or shorter sleep.
- 5. Stress/anxiety:** Chronic stress can induce artery inflammation, plaque formation, and other risk factors for heart disease and heart attack. A person suffering from nomophobia has difficulty breathing, which can lead to abrupt cardiac arrhythmias and MI.
- 6. Treatment:** According to recent studies treatment based on:
 - **Medical therapy:** by using beta blockers and calcium channel blockers, which reduce the number and duration of ischemia episodes the most. Calcium channel blockers are used mostly in monotherapy if the patient is intolerant of beta-blockers. They are also used in individuals who

have specifically identified a pathogenic mechanism that is likely to respond better to calcium channel blockers (e.g., vasospastic angina). Antiplatelet and lipid-lowering medications (such as aspirin and statins) are also utilized.

- **Psychotherapy:** Psychotherapists assist patients in reducing stress because mental stress can cause silent myocardial infarction, which is specific to coronary artery disease. In psychotherapy, the psychotherapist attempts to reduce mental, social, and emotional alterations that may lead to cardiac arrhythmia in the patient.
- **Revascularization:** This method is rarely employed. It refers to a class of medical procedures that aim to restore a portion of the heart's blood flow that has been restricted or inhibited. This could be accomplished through surgery or minimally invasive techniques such as angioplasty.

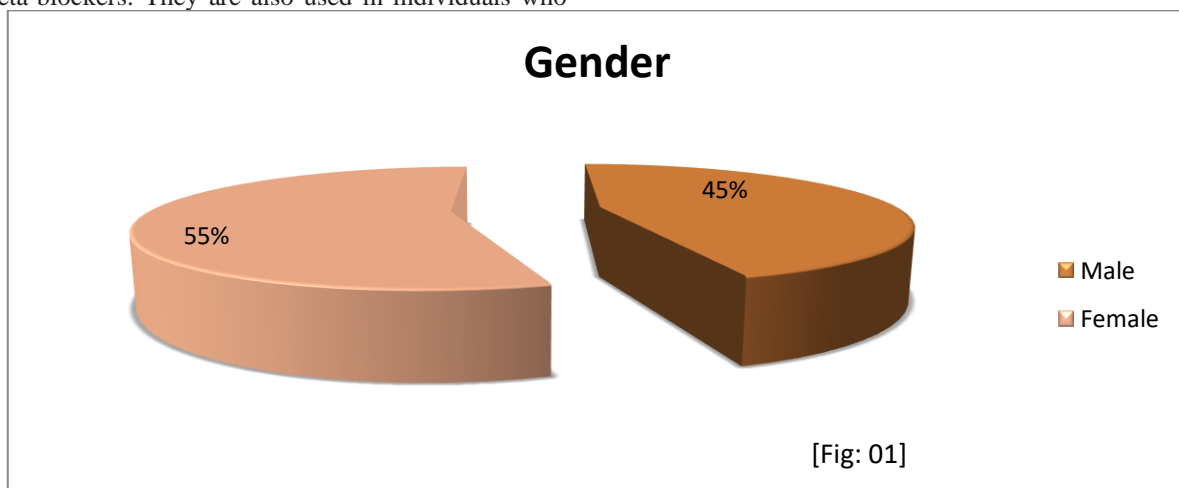
Histopathology

Histopathological findings in myocardial infarction are as follows;

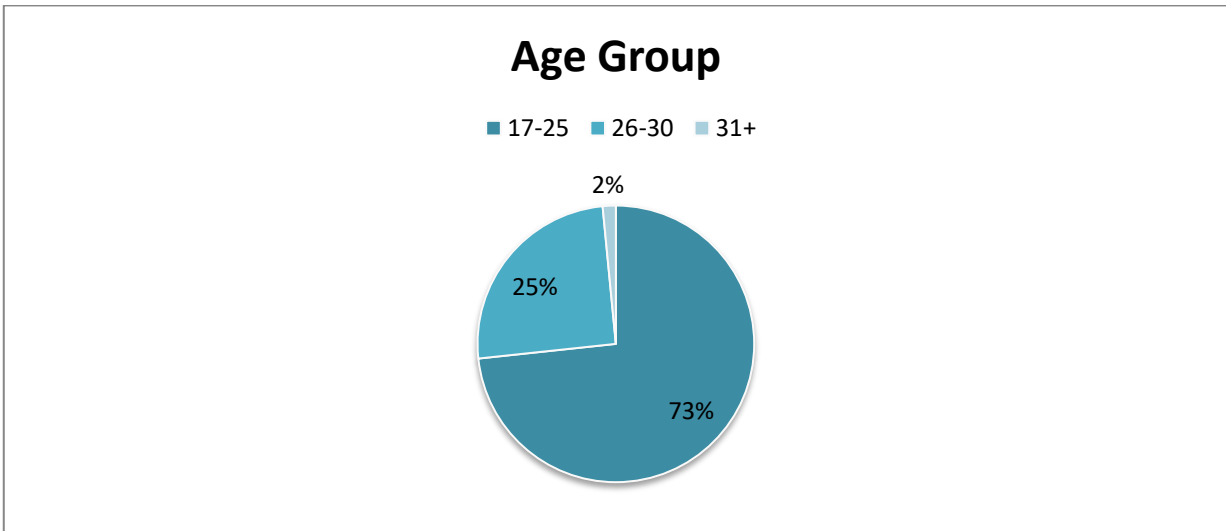
- Characteristic features within 24 hours include coagulation necrosis of cardiomyocytes, neutrophilic infiltration, accumulation of RBCs in the interstitial spaces, and interstitial edema. In eosinophilic-appearing ischemic cardiomyocytes with loss of cross-striations and loss of the nuclei. After more than 2 days, there are some changes: loss of myocyte nuclei, macrophages, and fibroblasts appears, neutrophils start to decline, and granulation tissue establishes with lymphocytic and plasma cell infiltration.
- After 4 to 8 weeks and more completely depending on the extent of necrosis and larger infarct healing leaving the central area unhealed with mummified myocyte for extended periods.

Survey based on the awareness about silent myocardial infarction

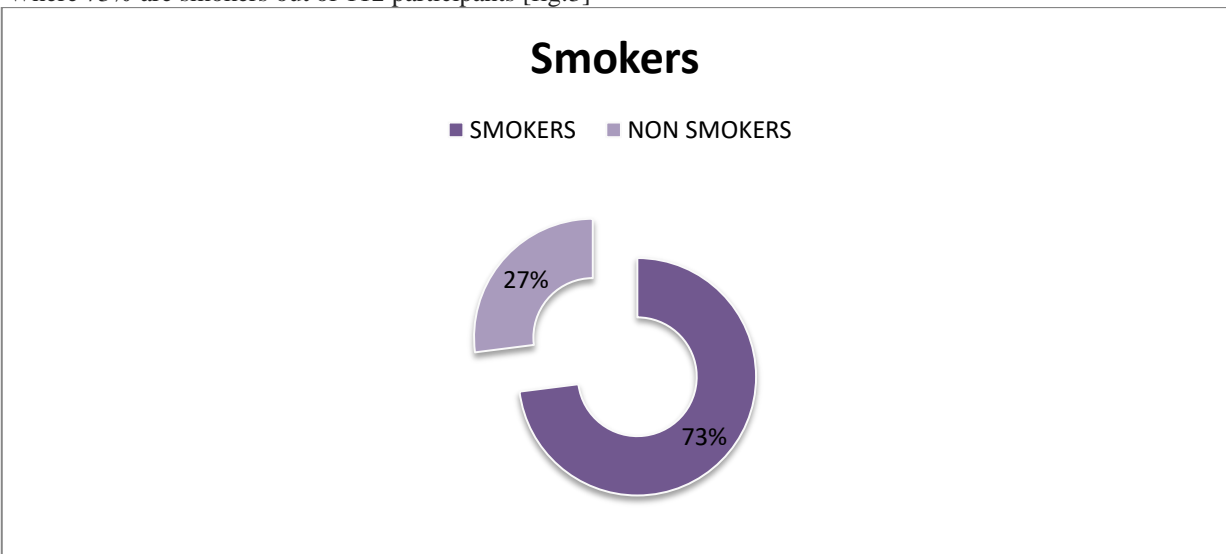
It is an observational study in which we conducted an awareness-based survey about MI with 112 participants, 50.4% of whom are males and 61.6% are females [fig:1]



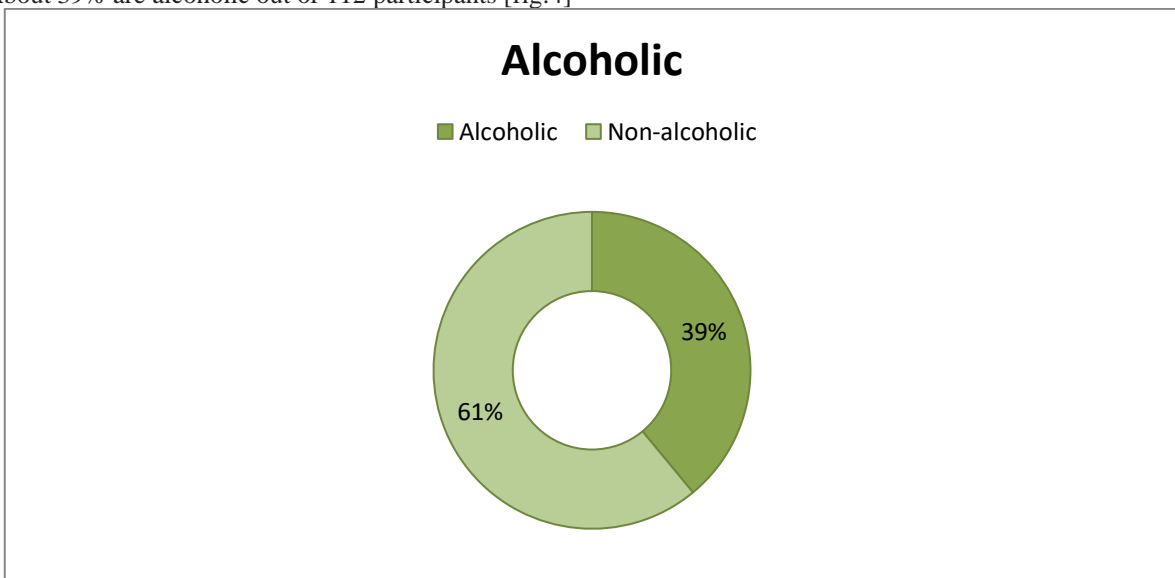
Participants comes from different age groups [fig:2]



Where 73% are smokers out of 112 participants [fig:3]



About 39% are alcoholic out of 112 participants [fig:4]



As per our study we found 36% of participants have higher risk of MI as per our study and according to the risk factors of MI.



CONCLUSION

According to recent studies and events of silent myocardial infarction, we found that patients don't go through routine checkups with their doctors and live an unconditional lifestyle, which may increase the risk of silent myocardial infarction. We also found that most of the patients go through an unhealthy diet as a mainstay for MI. Cigarette smoking also causes inflammation and swelling in the blood vessels, which provokes MI. If the patients stop smoking and perpetuate their lifestyle with a healthy diet and manner of life, then they can reduce the chances of silent myocardial infarction. We also conducted a survey on MI knowledge, in which we identified an age range (17-65 years) of different genders and informed them about MI signs and symptoms, risk factors, and first aid. We discovered that 94% of individuals are aware of the MI, with 73% being smokers and 39% drinking alcohol. Overall, 36% of 112 participants have a higher risk of MI than others due to their lifestyle and dietary habits, according to the MI risk factor.

Consent and Ethical Approval

It is not applicable

Competing Interest

There is no competing interest

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