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Unmasking Silent Myocardial Infarction: A Comprehensive Review of Epidemiology, Risk Factors, Early Detection, Clinical Outcomes, and Preventive Strategies

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ABSTRACT

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Background: - One of the main causes of death worldwide is heart disease. Nearly 25% of cardiac patients experience non-fatal myocardial infractions or unexpected fatalities without any warning signs. Therefore, silent heart attacks are also known as silent myocardial infractions (SMI), and they might be entirely asymptomatic or have symptoms that are so subtle that patients are unable to recognize them. Even so, the ECG may not always be able to identify the symptoms. However, the signs of a traditional heart attack include cold chills, sobs, and chest pain. Despite their understated appearance, they pose serious long-term health hazards and harm the heart to the same extent. We believed that the fundamental processes of SMI involved a reduction or obstruction in the heart's blood flow, up on forming plaques. The following patient groups are subjected here like Hypertension and hyper lipidaemia, diabetic, elderly, women, and smoking, Increased awareness regularly screening and preventive measures are essential to mitigate the silent threat by these unrecognised heart attacks. Hence, this study explores a complete prevalence, Risk factors and outcomes of silent heart attacks across different patient groups.

KEYWORDS:
SMI – Silent Myocardial Infraction, HTN – Hypertension, SOB – shortness of breath, CVD – cardio vascular diseases, DM- Diabetes mellitus, CAD – Coronary artery disease.

INTRODUCTION

Another name for silent myocardial infractions (SMIs) is silent heart attacks. It is a significant un acknowledged phenomena that poses a significant obstacle to CVD care. The sudden death (non-fatal myocardial infraction) that occurs in about 25% of coronary patients occurs without any prior symptoms. [1]. These symptoms can be so subtle that the patient may not even notice them. Even while ECG can occasionally fail to identify its symptoms, The absence of symptoms can cause delays in diagnosis and treatment, as well as additional consequences such cardiac arrhythmias, which can lead to cardiac arrest. Therefore, it is difficult to identify the specific cases of decreased MI perception in some patients; however, there may be impairments in cardiac receptor stimulation, impulse onset or conduction, or cerebral discomfort.[4].

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Information gathered from the aforementioned studies that track individuals from general populations who have a history of CVD, CAD risk, or HTN and have been assessed with the appropriate treatments. Thus, this review study investigates the whole prevalence, risk factors, and consequences of silent heart attacks in various patient populations.

- **SMI's prevalence and traits include:** About 45% of all myocardial infractions are caused by SMIs. Compared to symptomatic heart attacks, silent myocardial infractions cause comparable or even higher long-term morbidity and mortality. SMIs are more common in men than in women. Furthermore, almost 75% of older persons who are male are more prone than females to have silent heart attacks. Additionally, between 50 and 80 percent of heart attacks are quiet [5].
- **Classification:** TYPE-1/CLASS-1: CAD patients with angina or other asymptomatic conditions. (Frequent heart type). Form - 2/CLASS-2: This form of MI is commonly seen by patients with a history of previous

MI. The most common kind, kind-3/CLASS-3, is characterized by unstable or vasospastic angina [6]. Similar to symptomatic heart attacks, SMIs have an underlying mechanism that involves a blockage or decrease in blood flow to the heart, usually as a result of plaque accumulation in the coronary arteries. However, atypical or extremely mild symptoms that are frequently attributable to non-cardiac reasons like weariness or dyspepsia might occur in patients with SMIs.

- **Risk factors for various patient populations:** Some groups are more susceptible to SMIs because of underlying medical disorders such as

1. **Hypertension and hyperlipidaemias**:- Individuals who frequently have high blood pressure and excessive cholesterol are more likely to experience SMIs, which can result in the development of CAD. This is due to the accumulation of fatty deposits around the blood vessel wall and artery lining, which can produce ischemia episodes that may not exhibit or show the usual warning symptoms [7].
2. **Patients with diabetes**: Research frequently demonstrates that individuals with diabetes have an increased danger of suffering from SMIs, which raises India's high rate of cardiovascular death. SMIs and other problems are more likely to occur in people with diabetes, especially TYPE-2. Excess blood sugar causes diabetic neuropathy, which damages nerves and results in dull pain perception, reducing the likelihood that patients would experience the usual chest discomfort linked to a heart attack. [8].
3. **Elderly patients**: Aging is a significant risk factor for SMIs, and older adults are more likely to have silent heart attacks because of changes in pain perception brought on by aging, low levels of physical activity relative to age, and a body pain receptor that may not react as rapidly or accurately as warning signs for SMI's [9].
4. **Women**: According to some experts, postmenopausal conditions involving hormonal shifts make women more susceptible to SMIs. Consequently, individuals report feeling tired and nauseous. which frequently has a non-cardiac nature [10].
5. **Smoking:** Tobacco usage remains major significant modifiable risk factor for CVD. Including silent heart attacks. Smoking contributes to attain atherosclerosis and reducing oxygen supply to heart leading to increase likelihood of ischemic events without symptoms of chest pain [11].

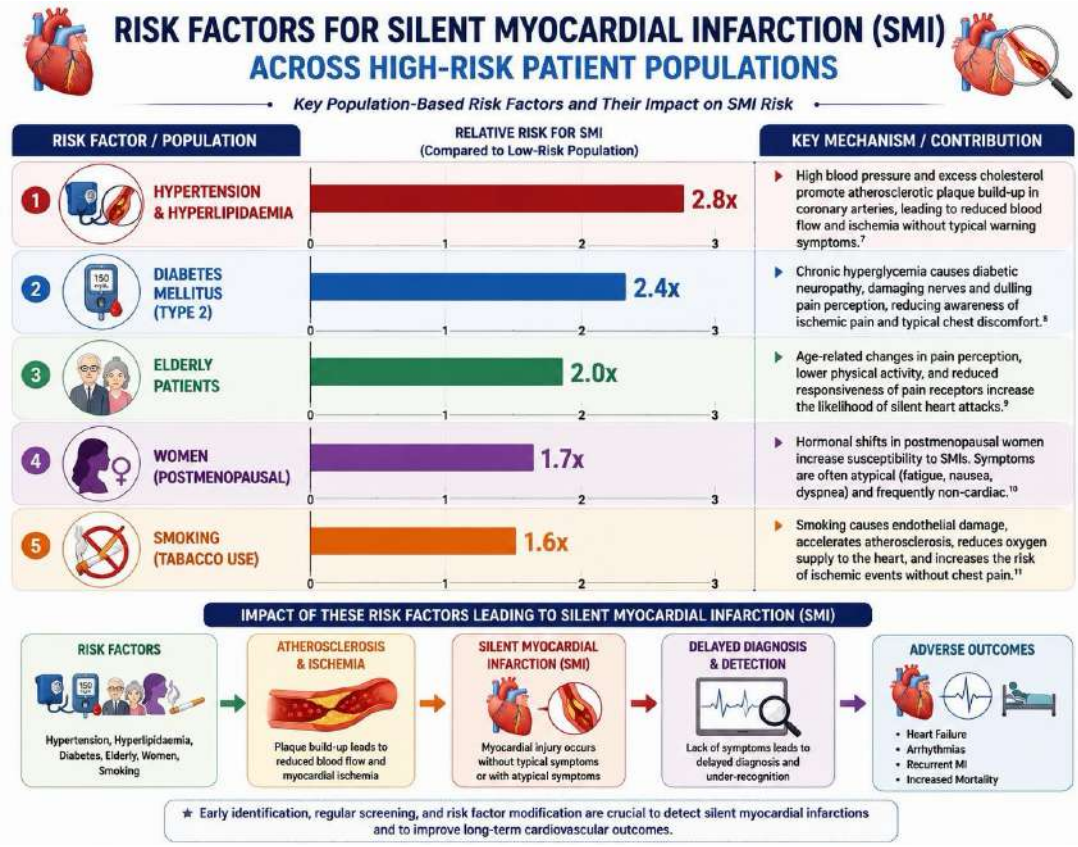

Fig -1 Represents Risk factors affecting various populations

- **Consequences and impacts of SMIs:** SMIs may not always show warning signs right away. They have a major long-term effect on health. Silent heart attacks nonetheless cause damage to the heart muscle, which eventually weakens cardiac function. Individuals who are frequently diagnosed with SMIs are more likely to experience potentially deadly, repeated MIs, heart failure, and arrhythmias. The best course of action would be to perform screening ECGs during their annual follow-up care [12]. According to research, people who have SMIs are more likely to die from cardiovascular events than people who have heart attacks since the damage may not be identified until a later medical emergency.

- **Rapid identification and prevention techniques:** Given the high frequency of SMIs and their grave implications, early diagnosis is essential. Frequent cardiovascular screening helps prevent undetected heart attacks, particularly in populations like the elderly, those with diabetes, and those with hypertension. Tight blood sugar management along with cardiovascular evaluations can reduce the risk of SMIs in diabetic people.

- **Life style modifications:-**
  Preventive strategies should be focus on ' life style modifications 'like

- smoking cessation,
- Regularly exercise
- A healthy diet

Effective management of HTN, cholesterol and Dm are crucial. pharmacological interventions including statins, beta blockers are beneficial for high-risk individuals to reduce the like hood of future cardiac events.

CONCLUSION

Silent myocardial infarction is a hidden and serious kind of cardiac disease that disproportionately affects women, individuals with diabetes mellitus, the elderly, persons with hypertension, and people with hyperlipidaemia's. SMIs often have worse outcomes than symptomatic heart attacks, despite the fact that they don't generate any symptoms. They also present significant long-term health risks. study investigates the whole prevalence, risk factors, and consequences of silent heart attacks in various patient populations.

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