Opinion
Volume 14:05, 2024

Journal of Clinical Case Reports

ISSN: 2165-7920 Open Access

A Rare Presentation of Acute Myocardial Infarction in a Young, Healthy Individual

Andrew Howard*

Department of Cardiology, University of Cologne, Cologne, Germany

Introduction

Acute Myocardial Infarction (AMI), commonly known as a heart attack, is typically associated with older adults or individuals with predisposing risk factors such as hypertension, diabetes, smoking, or hyperlipidemia. However, in rare cases, AMI can occur in young, seemingly healthy individuals without any of the traditional risk factors. This rare presentation is particularly concerning as it challenges the conventional understanding of myocardial infarction and may lead to delays in diagnosis and treatment. The pathophysiology behind AMI in younger, healthy individuals may differ from that seen in older patients. Factors such as spontaneous coronary artery dissection, myocarditis, or coronary artery anomalies may be responsible for this unusual presentation. Additionally, lifestyle factors like extreme physical exertion, substance use, or undiagnosed genetic conditions can play a significant role in precipitating an acute coronary event in this population.

Given the rarity of AMI in young, healthy individuals, it is crucial for healthcare providers to maintain a high index of suspicion when faced with atypical presentations of chest pain, even in those without traditional risk factors. This case report aims to explore such a rare occurrence of acute myocardial infarction in a young, healthy individual, highlighting the importance of early recognition, prompt intervention, and a comprehensive understanding of the varied etiologies of AMI in this demographic [1].

Description

Acute Myocardial Infarction (AMI) is a critical cardiovascular event that traditionally occurs in individuals with well-established risk factors, including advanced age, hypertension, diabetes mellitus, hyperlipidemia, smoking and a family history of heart disease. However, an increasing number of cases of AMI have been reported in younger individuals who present with few or no traditional cardiovascular risk factors. These cases often raise significant challenges for clinicians, both in terms of early identification and optimal management, as the clinical presentation may not align with the usual risk profiles associated with AMI. In young, seemingly healthy individuals, the pathophysiology underlying AMI can differ substantially from that seen in older adults with traditional risk factors. The causes of AMI in this population are diverse, and while many are still poorly understood, several key mechanisms have been identified; SCAD is one of the most recognized causes of AMI in young, healthy individuals, particularly women. It occurs when the layers of the coronary artery wall separate, creating a false lumen that obstructs blood flow. SCAD is often associated with pregnancy, postpartum states, or extreme physical or emotional stress. The exact cause remains unclear, but SCAD is thought to be linked to underlying connective tissue disorders, hormonal influences, or vessel wall abnormalities. Although less common, it is an important differential diagnosis in younger patients presenting with Acute Coronary Syndrome (ACS). Congenital coronary artery anomalies, such as anomalous coronary artery origin or coronary artery fistulas, can predispose younger individuals to AMI. In these cases, the abnormal anatomy may lead to impaired blood flow, especially under conditions of increased cardiac demand. While many individuals with coronary artery anomalies remain asymptomatic throughout their lives, they can present with AMI if the anomaly causes ischemia, particularly during physical exertion or stress [2].

Coronary artery vasospasm is another potential cause of AMI in young, healthy individuals. In these cases, transient narrowing or spasm of a coronary artery can occur, reducing blood flow to the heart muscle and precipitating myocardial injury. This phenomenon may be triggered by stress, cold exposure, or the use of drugs such as cocaine or marijuana. Endothelial dysfunction, which can impair the normal dilation and constriction of blood vessels, may also play a role in causing myocardial infarction in individuals without significant atherosclerotic disease. Some young individuals may have undiagnosed thrombophilia or hypercoagulable states, which increase the risk of clot formation in the coronary arteries. Conditions such as antiphospholipid syndrome, Factor V Leiden mutation, or protein C and S deficiencies can predispose individuals to thrombosis, potentially resulting in AMI. A history of unexplained venous thromboembolism or a family history of clotting disorders may raise suspicion for this etiology. The use of stimulant drugs like cocaine, amphetamines, and even synthetic cannabinoids has been implicated in causing AMI in young, otherwise healthy individuals. These substances can cause coronary artery spasm, increase blood pressure, and accelerate plaque rupture, all of which can precipitate an acute coronary event. While the cardiovascular effects of illicit drug use are well-documented, they remain under recognized as a cause of AMI in younger patients who may not have a clear history of drug use [3].

In some cases, extreme physical activity, such as intense exercise, endurance sports, or heavy weightlifting, may induce AMI in young individuals. This may be particularly true for individuals with underlying, previously undiagnosed coronary artery disease or connective tissue disorders. Although exercise is generally beneficial for cardiovascular health, in rare cases, it may exacerbate existing coronary pathology or trigger a thrombotic event. Conditions such as vasculitis, Systemic Lupus Erythematosus (SLE), or rheumatoid arthritis can contribute to the development of AMI in young individuals. Inflammatory processes associated with these diseases can damage the arterial walls, promote plaque instability, and increase the risk of thrombosis, all of which may lead to myocardial infarction. Additionally, systemic inflammation can contribute to endothelial dysfunction, further compromising vascular health. In some young patients, a genetic predisposition to premature cardiovascular disease may be present, even in the absence of traditional risk factors. Familial hypercholesterolemia, for instance, is an inherited disorder that leads to very high levels of Low-Density Lipoprotein (LDL) cholesterol, accelerating the process of atherosclerosis. While genetic screening is not routinely performed in young, healthy individuals, a family history of early cardiovascular events or lipid abnormalities may warrant further investigation [4].

The clinical presentation of AMI in young, healthy individuals may vary, but typically includes sudden-onset chest pain, often described as sharp or pressure-like, accompanied by shortness of breath, nausea, sweating,

***Address for Correspondence:** Andrew Howard, Department of Cardiology, University of Cologne, Cologne, Germany E-mail: howard.andrew@koeln.in*

Received: 02 September 2024, Manuscript No. jccr-24-152646; **Editor assigned:** 04 September 2024, PreQC No. P-152646; **Reviewed:** 16 September 2024, QC No. Q-152646; **Revised:** 23 September 2024, Manuscript No. R-152646; **Published:** 30 September 2024, DOI: 10.37421/2165-7920.2024.14.1627

and dizziness. However, atypical symptoms such as fatigue, indigestion, or palpitations may also occur, making it more challenging to differentiate AMI from other less serious conditions, especially in young individuals without known cardiovascular risk factors. Despite the rarity of AMI in young individuals, the potential for serious morbidity and mortality necessitates a high index of suspicion when patients present with acute chest pain or related symptoms. Early recognition, prompt diagnostic workup (including ECG, cardiac biomarkers, and imaging), and appropriate management are essential for improving outcomes in these patients. Diagnostic modalities such as coronary angiography, Intravascular Ultrasound (IVUS), or cardiac MRI may be necessary to identify underlying causes that are not immediately apparent on standard imaging [5].

Conclusion

In summary, while AMI is uncommon in young, healthy individuals, its occurrence highlights the importance of considering a broad range of potential etiologies. Factors such as coronary artery dissection, vasospasm, genetic predispositions, and illicit drug use should all be considered in the differential diagnosis. Awareness of these less common causes can aid in timely diagnosis and intervention, ensuring that young patients receive appropriate care and reducing the risk of long-term complications or death. This case highlights the need for continued research and awareness surrounding the mechanisms of AMI in younger, healthy individuals, and the importance of vigilant clinical evaluation to identify this rare but life-threatening condition.

Acknowledgment

None.

Conflict of Interest

None.

References

1. Dyrbuś, Krzysztof, Mariusz Gąsior, Piotr Desperak and Tadeusz Osadnik, et al. "The prevalence and management of familial hypercholesterolemia in patients with acute coronary syndrome in the Polish tertiary centre: Results from the TERCET registry with 19,781 individuals." *Atherosclerosis* 288 (2019): 33-41.
2. Kwok, Chun Shing, Kirellos Said Abbas, Adnan Iqbal Qureshi and Gregory Yoke Hong Lip. "Outcomes for patients hospitalized with acute myocardial infarction and cerebral infarction in the United States: Insights from the national inpatient sample." *Intern Emerg Med* 18 (2023): 375-383.
3. Unnikrishnan, Dileep, Radhika Annam, Aasems Jacob and Braghadheeswar Thyagarajan, et al. "STEMI in a young male after use of synephrine-containing dietary supplement." *Case Rep Cardiol* 2018 (2018): 7074104.
4. Smolderen, Kim G., John A. Spertus, Brahmajee K. Nallamothu and Harlan M. Krumholz, et al. "Health care insurance, financial concerns in accessing care, and delays to hospital presentation in acute myocardial infarction." *JAMA* 303 (2010): 1392-1400.
5. Fulton, Lawrence V., Omolola E. Adepoju, Diane Dolezel and Tahir Ekin, et al. "Determinants of diabetes disease management, 2011–2019." *Healthcare* 9 (2021) 944.

How to cite this article: Howard, Andrew. "A Rare Presentation of Acute Myocardial Infarction in a Young, Healthy Individual." *J Clin Case Rep* 14 (2024): 1627.