

## Sudden Cardiac Death in Young Individuals Due to Occlusive Coronary Artery Disease: An Alarming Indicator for Public Health

Abhishek Yadav<sup>1</sup>, Varun Chandran<sup>2</sup>, D. Balaji<sup>3</sup>, Sudhir K Gupta<sup>4</sup>

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### Abstract

Coronary artery disease (CAD) is the main cause of Sudden Cardiac deaths (SCD). SCD in young individuals particularly who are asymptomatic cause huge emotional shock to the family members who are left bewildered by this sudden mis-happening. We report a case of a sudden cardiac death in a healthy youth with no previous complaints who died in his normal routine while going to office. The authors aim to highlight the presence of undiagnosed heart disease in young individuals so that preventive steps may be taken for early diagnosis and treatment. The authors also intend to add to the Medical literature about the incidence of CAD in young individuals.

**Keywords:** Sudden Cardiac Death; Coronary Artery disease; Atherosclerosis; Ventricular Arrhythmia; Myocardial Ischaemia.

### Introduction

Cardiovascular diseases (CVD) is a cause of about a quarter of all deaths in India and Coronary artery Diseases (CAD) are the leading group in them [1,2]. CAD are continuously increasing in India and likewise developing nation [3]. This may be attributed to modernization, industrialization, urbanization, and related lifestyle changes like unhealthy food habits, lack of exercise etc. [4]. Though it is a natural cause of death but a Medicolegal investigation is initiated when there is sudden death due to Cardiac conditions. Sudden cardiac death is defined as death from unexpected circulatory arrest—usually a result of cardiac arrhythmia—that occurs within 1 hour

<sup>1</sup>Assistant Professor, <sup>2</sup>Senior Resident, <sup>3</sup>Junior Resident, <sup>4</sup>Professor & head, Department of Forensic Medicine and Toxicology, All India Institute of Medical sciences (AIIMS), New Delhi 110029. India.

**Correspondence and Reprint Requests:** Abhishek Yadav, Assistant Professor, Department of Forensic Medicine and Toxicology, All India Institute of Medical sciences (AIIMS), New Delhi 110029, India.

E-mail: drayad\_in@yahoo.com

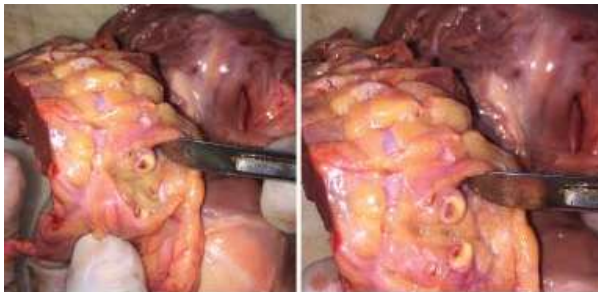
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of the onset of symptoms [5]. The frequency of sudden cardiac death in young individuals is significantly increasing. These individuals are usually asymptomatic before and the underlying heart disease is diagnosed after the death of individual. This also causes huge emotional shock for the family members who are left bewildered by this sudden mis-happening. Though middle aged individuals have started to get preventive health checkups but still this aspect is very often being overlooked by the people particularly in the young age groups. We report a case of sudden cardiac death in a healthy youth who was only 26 years old who had no previous complaints and Medical History but died in his normal routine while going to office. The authors aim to highlight the presence of undiagnosed heart diseases in young individuals at an early age for sensitization of the society so that preventive steps may be taken for early diagnosis and treatment. The authors also intend to add to the Medical literature about the increased incidences of sudden cardiac death in young individuals.

## Case Report

A 26 years old young individual suddenly lost consciousness and collapsed while moving on an escalator in a metro station. He was taken to a nearby hospital where he was declared brought dead. As it was a sudden death, a MLC was made in the hospital and postmortem was conducted in All India Institute of Medical sciences, New Delhi. In postmortem examination, bluish discoloration was present over the nail beds indicating cyanosis. Few minor injuries were present over the body which were consistent with the fall on escalator but were superficial and not contributing to cause of death. Brain and other Visceral organs were congested. Lungs were congested and edematous. In heart, walls and chambers were intact. Atherosclerotic thickening of wall of proximal one third of left anterior descending branch of left coronary was present along with an impacted thrombus resulting in 100% blockage of lumen (Image-1). Other coronaries were patent. No sign of poisoning was present in the stomach.

The cause of death was concluded in the report as "Shock due to Myocardial Insufficiency due to occlusive atherosclerotic coronary artery disease with an impacted thrombus".



**Image 1:** Atherosclerotic thickening of wall of proximal one third of left anterior descending branch of left coronary along with an impacted thrombus resulting in 100% blockage of lumen

## Discussion

Coronary artery disease (CAD) is the main cause of Sudden Cardiac deaths (SCD) [6]. In occlusion of coronary arteries, clinical symptoms are due to progressive narrowing of the lumen leading to stenosis or acute plaque erosion or rupture with thrombus. It leads to compromised blood flow and leads to Myocardial Ischemia. Obstructions greater than 75% of the lumen of the coronaries are classified as significant coronary artery disease. SCD is caused by regional myocardial ischemia leading to fatal ventricular arrhythmia [6]. The deceased in our case had 100% blockage of the lumen of

anterior descending branch of left coronary artery due to an impacted thrombus in atherosclerotic lumen (Image -1).

SCDs in the persons over 35 years of age are mostly caused by Ischaemic Heart diseases, whereas in young individuals congenital and hereditary conditions are the main factors [7,8]. In young people the reasons for SCDs are hypertrophic cardiomyopathy, coronary artery anomalies with an inter-arterial or intramural course, and arrhythmogenic right ventricular cardiomyopathy. So we can clearly see that the deceased in the present case was not in the age group which is considered as at risk for CAD due to atherosclerosis [7,8]. This is an alarming indicator which necessitates the need of further studies regarding the prevalence of CAD in young individuals particularly in the age group of 20-30 years. Prabhakaran et al. [9] revealed high prevalence of coronary risk factors in a selected relatively young male population in an industrial setting from north India. Rapid urbanization and change in lifestyle have increased the coronary risk factors in India like Diabetes, hypertension, dyslipidemia, smoking, central obesity, alcoholism and physical inactivity [10].

The deceased was unmarried and used to live with his parents and sister. He left his home as a normal routine to go to office and then collapsed in the Metro station. He was living a normal life and didn't have any previous complaints/symptoms of cardiac disease before the incident. The family also did not suspect any foul play. During the interview, the family members did not revealed any history of smoking, alcoholism, excessive fat intake, previous Medical condition etc. According to them the deceased was a perfectly healthy individual. Several studies and researches have been done to find risk factors and bio markers of CAD but identifying the asymptomatic individuals who are at risk of developing SCD associated with CAD still remains a challenge [11,12,13]. Timely diagnosis and Medical intervention are the most important factors to reduce the Mortality in such patients. Though the deceased was taken to a nearby tertiary care hospital by the Metro Police still his life could not be saved.

Preventive measures like cessation/control of alcohol and smoking and Screening for Blood Glucose Level, Dyslipidemia, Hypocholesteremia, Hypertension, etc could play an important role in such underlying heart disorders. The symptoms like chest pain, dyspnea, palpitations, presyncope, and syncope should not be taken lightly and careful history and proper physical

examination should be done. The approach includes noninvasive testing, such as 12-lead, exercise, and Holter electrocardiography (ECG); cardiac imaging; electrophysiologic testing; and molecular genetic testing if required [14]. Screening of young individuals, particularly those involved in athletics and exercise, have identified the young athletes who have increased risk of cardiovascular diseases thereby decreasing incidence of sudden deaths [15-16].

### Conclusion

This case is a clear indicator that young adults may be at the risk of Sudden Cardiac Death due to epidemic underlying CAD whose prevalence may be low but emotional trauma to the family of the deceased is huge due to unexpected demise. The life style changes may be the predisposing factor particularly junk foods, alcohol abuse, smoking, stress factor, lack of daily exercise or unsupervised heavy exercise. Though the task is huge and tedious timely identification and management of young adults for CAD is the need of the hour.

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