

# Myocardial Infarction in the Young Indian patient - An Emerging Problem

**S Vasudevan**

Editor, Kerala Medical Journal, Trivandrum\*

*Published on 28<sup>th</sup> March 2013*

Coronary Heart Disease (CHD) is the leading cause of death in adults in the Western World. Myocardial Infarction is the lethal manifestation of this disease and can present as sudden death. Traditionally this occurs in adults over 45 years of age. The age limits for such definition is slightly different in various studies. Premature CAD is defined as CAD occurring below the age of 65 in women and 55 in men. CAD in the young is defined as CAD occurring in patients less than 40 years of age. In this study 45 years is taken as cut off for defining young patients.

Of late more younger patients are suffering from this problem. This disease carries a significant morbidity, psychological effects and financial constraints for the person and the family when it occurs at a young age. The protection offered by the young age has been slowly taken away by the increased prevalence of the risk factors for CHD in adolescents such as smoking, hyperlipidemia, junk food ingestion leading to obesity and lack of physical activity. Not much published data is available to guide the management of suspected acute MI in young patients less than 45 years. Better prognosis among young adults is achieved when the appropriate investigations and treatment are offered.

## Epidemiology

The incidence of CHD is declining in the UK in all age groups. CHD in the younger population aged less than 40 years represents only less than 3% of all patients with CHD.<sup>1,2</sup> The prevalence of risk factors is on the rise in young adults and children. An increased disease burden can be expected in the near future. This is of preventive value. Smoking is increasingly prevalent in the young adults and adolescents. The smoking habit in young girls is causing alarm. Obesity is of growing concern and has increased many folds over years. Poor physical activity and lack of good eating habits especially the popularity of fast food or junk food

has led to higher incidence of overweight and obesity among youngsters. Metabolic syndrome and Insulin resistance were found in many young patients with acute MI. Studies in the US have shown the disproportionate incidence of heart disease in Asian Indians in the form of MI at a younger age and more complex coronary care abnormalities. Substance abuse is rising in recent years and is proving to cause MI in young age.

Similar figures regarding Indian patients is available.<sup>3</sup> The study involved performing coronary arteriograms in 104 patients less than 40 years presenting with acute MI. Similar to their Western counterparts young Indian patients with MI and obstructive CAD have a high frequency of coronary risk factors especially smoking and multiple obstructive vessel disease.

South Asians also seem to be predisposed to early and accelerated atherosclerotic disease as compared with other ethnic groups, resulting in a high rate of premature morbidity and mortality. About 70% of MI patients in Calcutta and 97% in Madras were less than 60 years old. Another report from Madras found that 10% of all patients undergoing catheterization for angina pectoris were 27-40 years old with a mean age of 38 years. In a recent study in Texas the prevalence of CAD in the young in the American population was found to be less than 2%; among Indians, this number is as high as 12%.<sup>5</sup> A British study found that among all patients admitted to a coronary care unit, the rate of a first myocardial infarction was five times higher among Indians than among native English when all age groups were examined. Yet, among the 30-39 age group, the rate among Indians was tenfold higher.<sup>6</sup> Similarly, in Malaysian study, the incidence of CAD in young Indians was fifteen fold higher as compared with Chinese, and tenfold higher as compared with Malays.<sup>7,8</sup> In terms of mortality due to CAD, when rates among Asian Indians were compared with overall rates in England and Wales, mortality was 2.1 times higher in

## Corresponding Author:

Dr. S Vasudevan, Associate Editor, Kerala Medical Journal, Trivandrum  
Phone: 9447124246, Email: periamana@gmail.com

Asian Indian men between the ages of 30-39, and 3.1 times higher between the ages of 20-29.

Lipoprotein (a) - Lp(a) has also recently been identified in several studies as an independent risk factor for CAD, especially among South Asians who tend to have baseline higher levels than whites. Lp(a) is a subfraction of LDL, but is several times more atherogenic than LDL. It consists of an LDL-like molecule which contains apolipoprotein B-100 which is attached by a disulfide linkage to a polymorphic apolipoprotein (a) moiety which is very similar to plasminogen. Thus, the LDL portion of Lp(a) is pro-atherogenic, and the apo (a) moiety, which resembles plasminogen, is prothromogenic. In a multi-ethnicity study in Singapore, Lp(a) was found to be significantly higher among Indians than Chinese and Malays.<sup>8,9</sup>

These risk factors point to increasing prevalence of CHD in the coming years. Under reporting of cases and lack of full evaluation of the presenting cases are proving to be a handicap to obtain full information about this subset.

More studies are needed to understand the reasons behind the earlier onset and the prevalence of more severe CAD in young Indian patients. It is in this context that a study was undertaken to find out the clinical characteristics, biochemical, echocardiographic features as well as prognostic determinants in young patients with Acute Myocardial Infarction. 100 young patients (less than 45 years) in the South Indian population, who are admitted to the wards of Medical College Hospital, Thiruvananthapuram, India with first Myocardial Infarction were analyzed for the clinical profile and prognostic factors. Smoking, Dyslipidemia, Diabetes and family history was identified causes.<sup>10</sup>

### Pathogenesis

The causes for MI in the age group below 45 years can be divided into four

1. Atheromatous
2. Non-atheromatous
3. Hypercoagulable
4. Related to substance abuse

### Clinical presentation of MI in the young patient

The clinical presentation of acute MI in the younger patient differs from that in the older patient. The classic presentation of a mild pain initially and later worsening to produce a classic severe angina is rare in

young patients. The first onset of pain could worsen to produce a fully evolved MI. The total duration of symptoms is often less than a week in most patients. History taking should include identification of family history of premature CHD, risk factor profile such as smoking, obesity, diabetes and hyperlipidemia in the patient and the family as well as identification of substance abuse. History of recurrent arterial or venous thrombosis should be identified.

### Secondary prevention

MI in younger patients does carry a better prognosis if appropriately treated. On the other hand poor control of risk factors carries a significant mortality and morbidity. Antiplatelet agents are used as per guidelines as in adults. Statins are needed and their clinical effect exceeds the lipid lowering effects.

Lifestyle changes play an important part in the management of these patients. Smoking cessation, control of diabetes and lipid lowering are shown to improve prognosis and obesity management to be followed strictly.

The importance of secondary prevention measures in all young patients admitted with MI is stressed since it can reduce long term mortality sufficiently.

## END NOTE

### Author Information

Dr S Vasudevan, Associate Editor, KMJ;  
Additional Professor, Department of Urology,  
Medical College, Trivandrum, Kerala, India.  
Phone: 9447124246  
Email: periamana@gmail.com

**Conflict of Interest:** None declared

**Cite this article as:** S Vasudevan. Myocardial Infarction in the Young Indian patient - An Emerging Problem. Kerala Medical Journal. 2013 Mar 28;6(1):1-3

## REFERENCES

1. Eged M, Viswanathan G, Davis GK. Myocardial infarction in young adults. Postgrad Med J. 2005 Dec;81(962):741-5.
2. Osula S, Bell GM, Hornung RS. Acute myocardial infarction in young adults: causes and management. Postgrad Med J. 2002 Jan;78(915):27-30.
3. Kaul U, Dogra B, Manchanda SC, Wasir HS, Rajani M, Bhatia ML. Myocardial infarction in young Indian patients: risk factors and coronary arteriographic profile. Am Heart J. 1986 Jul;112(1):71-5.
4. Ravish Sachar: Risk factors for Coronary Artery Disease in young South Asians: A cross-sectional study of Indians living in India

- and second generation Indian immigrants to the United States of America.
5. Negus BH, Willard JE, Glamann DB, Landau C, Snyder RW, Hillis LD, et al. Coronary anatomy and prognosis of young, asymptomatic survivors of myocardial infarction. *Am J Med.* 1994 Apr;96(4):354–8.
  6. Krishnaswami S, Prasad NK, Jose VJ. A study of lipid levels in Indian patients with coronary arterial disease. *Int J Cardiol.* 1989 Sep;24(3):337–45.
  7. Hughes LO, Raval U, Raftery EB. First myocardial infarctions in Asian and white men. *BMJ.* 1989 May 20;298(6684):1345–50.
  8. Hughes K, Aw TC, Kuperan P, Choo M. Central obesity, insulin resistance, syndrome X, lipoprotein(a), and cardiovascular risk in Indians, Malays, and Chinese in Singapore. *J Epidemiol Community Health.* 1997 Aug;51(4):394–9.
  9. Scanu AM, Lawn RM, Berg K. Lipoprotein(a) and atherosclerosis. *Ann Intern Med.* 1991 Aug 1;115(3):209–18.
  10. Rajasekharan C, Mithun C B, Mathew Iype. The clinical profile and prognostic factors of acute Myocardial Infarction in the young – YSSI STUDY: *KMJ*; Vol VI Issue 1: 5-10 (2013).