

## CASE REPORT

### Atypical Presentation of Acute MI : Low HDL A Single Risk Factor

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#### Introduction:

Acute myocardial infarction (AMI) can occur in young people but still relatively rare in young women. AMI is the interruption of blood supply to the heart, causing heart cells to die commonly due to occlusion of a coronary artery following the rupture of a vulnerable atherosclerotic plaque which is an unstable collection of lipid (fatty acids) and white blood cells (especially macrophages) in the wall of an artery. The resulting ischemia (restriction in blood supply) and oxygen if left untreated for a sufficient period of time can cause damage or death (infarction of heart muscle tissue myocardium). The contributory risk factors for atherosclerosis and ischemic heart diseases (IHD) are generally common for MI. These are diabetes, smoking, low HDL, high Triglycerides (TG). Low level of High density lipoprotein cholesterol (HDL-C) is a predictable risk factor in the development of atherosclerosis and IHD in women than in men. Low HDL is one of the most common lipid disorders in patient with premature coronary heart disease. Current European and US guideline showed elevated TG and low HDL levels are common lipid abnormalities even in the absence of raised LDL-C although

guideline identifies the reduction of LDL level as the primary for the treatment of dyslipidaemia<sup>1</sup>. Framingham heart study population showed that reduction of 1 mg / dl of HDL leads to an increase in risk by about 2-3 % of coronary heart disease in both sex<sup>2</sup>. This case highlighted the possibility of the development of AMI in young female patient with dyslipidemia (Low HDL and high TG).

#### Case report:

A 27 years old women was admitted in medicine ward of Holy Family Red Crescent Medical College Hospital with high grade continuous fever (102 F-104 F) associated with throat pain, nausea and vomiting for 3-4 days. On second day of admission she developed sudden severe central chest pain which was tightening in nature associated with sweating and pain radiated to left arm and back and pain was quite relieved by taking sublingual GTN. On inquiry, she gave a significant history CABG of her father on 2010. Her body weight 74kg (BMI=30kg/metre square) and no history of OCP. On admission in CCU she was sweaty and her BP=120/80 mm Hg, pulse=110/min, Heart sounds were normal, chest was clear, temperature was 100F, tongue was coated and spleen was just palpable. Her bedside ECG revealed-2-3 mm ST segment elevation in ii,iii,AVF. CK-MB and Troponin I was positive.

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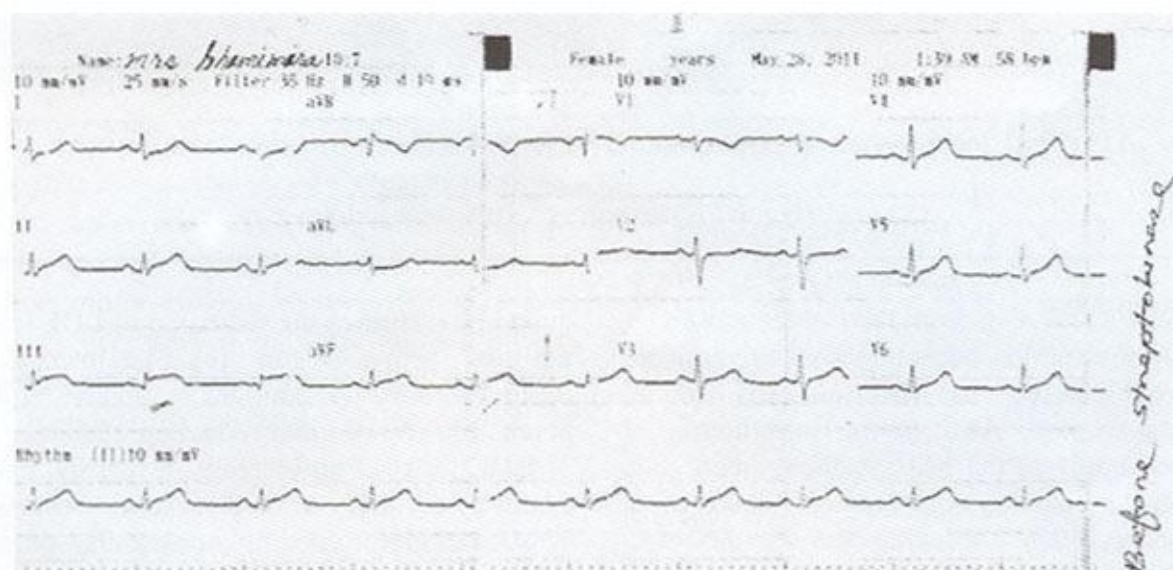


Figure 1: Electrocardiograph of the patient

All initial laboratory tests were done to exclude fever, diabetes, renal functions and hepatic enzymes. Total cholesterol- 158mg/dl, Triglyceride- 470mg/dl, HDL- 9mg/dl, LDL- 110mg/dl. 2D mode echocardiography showed inferior ischemia (EF= 56%) and CK-MB (98.7 IU/L) and Troponin I was positive. No thrombus was detected. She was diagnosed as a case of Acute MI (inferior) with dyslipidaemia

#### Discussion:

Lipids, together with protein and carbohydrate, are the main components of living cells. Cholesterol and triglycerides are lipids that are stored in the body and serve as a source of energy in addition to their role in cell structure. Desirable levels of blood fats are i) Total cholesterol, Below 200 mg/dl, ii) HDL cholesterol, Men: above 40 mg/dl, Women: above 50 mg/dl, iii) LDL cholesterol, Below 100 mg/dl, Below 70 mg/dl for people with diabetes or heart disease, iv) Triglycerides, Below 150 mg/dl<sup>3</sup>.

When LDL cholesterol levels are high, fatty deposits (called plaques) can build up in the arteries, the blood vessels that carry blood from the heart throughout the body. Over time, plaques narrow the arteries, producing atherosclerosis (hardening of the arteries). This can cause heart disease, peripheral artery disease (reduced blood flow in the limbs, usually the legs), or stroke. Low levels of HDL and high levels of triglycerides can also increase fat build-up in the arteries. High level of HDL-C, however protect the heart by helping to remove the build up of LDL from the arteries, oppose atherosclerosis directly at several key stages, by removing cholesterol from foam cell, by inhibiting the oxidation of LDL, by limiting the inflammatory process that underlie atherosclerosis. It also has anti-thrombic properties, maintenance of endothelium clean and healthy and therefore HDLC considered good cholesterol.

The association between cardiovascular events and LDL-C is well established, and abundant evidence shows a reduction in clinical events

in both men and women when LDL-C levels are lowered. The current guidelines from the National Cholesterol Education Program (NCEP) Adult Treatment Panel (ATP) III, as well as the more recent American Heart Association (AHA) guidelines for cardiovascular disease prevention in women, reinforce LDL-C as the primary target of therapy. LDL-C levels are generally lower in women than in men until menopause, when levels increase and LDL particles become smaller, denser, and therefore more atherogenic.

The Framingham Heart Study established both HDL-C and triglycerides as important predictors for coronary events. This association was noted to be independent of total cholesterol level and applied to both sexes. Some studies suggested that triglyceride and HDL levels may have greater predictive potential in women compared with men<sup>4</sup>. More recently, the Lipid Research Clinics' Follow-Up Study also demonstrated that both HDL-C and triglycerides were better predictors of coronary risk and cardiovascular mortality in women than total cholesterol or LDL-C. An increase in triglycerides of 1 mmol/L was associated with a 76% increased risk of cardiovascular disease in women versus 32% in men. In both ATP III and the new AHA guidelines for women, non-HDL-C is a secondary target of therapy.

On average, women have HDL-C levels approximately 10 mg/dL greater than those of men, which may help account for the disparity in cardiovascular events between men and women. ATP III recognizes this sex disparity in the guidelines for diagnosing metabolic syndrome; whereas HDL-C <40 mg/dL is a risk factor in men, HDL-C <50 mg/dL is considered a risk factor in women. Although

the ATP III guidelines do not give different HDL-C targets for treatment based on sex, the new AHA guidelines for women recommended to raise HDL-C levels  $\geq 50$  mg/dL.

#### References:

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