Is there Need for Assessing Cardiometabolic Risk Factors in Young Urban Healthy Asymptomatic Individuals?

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Abstract

Cardiovascular diseases are the most common cause of death and disability in both developed and developing countries. This is attributed to the stress, high incidence of hypertension and the steep rise in the metabolic parameters like blood sugars, cholesterol. Studies on the prevalence of these risk factors especially in the younger age group are warranted to study the trend and to institute guidelines for periodicity of monitoring and management. Justifying the need for routine health screening for cardiometabolic risks in young urban asymptomatic healthy individuals is the main aim of our study. Primary prevention seeks to prevent new onset atherosclerotic cardiovascular diseases (ASCVD).

Index terms— young asymptomatic individuals, cardiometabolic risks, coronary artery disease ASCVD.

1 Introduction

ardiovascular diseases (CVD) are the most common cause of death and disability in both developed and developing countries and approximately accounts for one-third of the deaths worldwide. 1 According to World Health Organization, by the year 2020 cardiovascular disease will be the leading cause of death and disability worldwide. Coronary artery disease (CAD) is predominant among the cardiovascular diseases and ranked number one in prevalence among the developing countries. 2 South Asians especially Indians have the highest rate of coronary artery disease. 3 As per the National Commission on Macroeconomics and Health (NCMH) there would be 62 million patients with CAD by 2015 in India and of these at least 50% of them would be patients younger than 40 years of age. CVD rate is increasing in both developing and developed countries as risk factors for the disease increase. This rise is attributed to the stress, high incidence of hypertension, dyslipidemia, steep rise in the metabolic parameters like blood sugars, cholesterol, obesity, physical inactivity, poor diet and smoking. Also long term epidemiological studies have shown consistently that persons with healthy lifestyles and few risk factors have a low risk of cardiovascular diseases. 4 Studies on the prevalence of these risk factors especially in the younger age group are warranted to study the trend and to institute guidelines for periodicity of monitoring and management. This helps us to understand why the cardiovascular diseases are 'breaking the age barrier.' Also identification of risk factors operating in young age group is important since correction of modifiable risk factors was found to be more yielding in this age group than in older patients. 5 Atherosclerotic cardiovascular diseases (ASCVD) is the leading cause of death in the world. It is observed more when the when countries become urbanized and industrialized. A vast database of population research relates cholesterol and lipoproteins to ASCVD. These relationships make it possible to determine optimal cholesterol levels for ASCVD prevention. The International Atherosclerosis Society (IAS) has developed a guide for dyslipidemia intervention. Primary prevention seeks to prevent new onset atherosclerotic cardiovascular diseases (ASCVD). These diseases include coronary heart disease (CHD), stroke, and other atherosclerotic vascular diseases. 6 II.

2 Aims & Objectives

The present study is focused mainly to justify the need for routine health screening for cardio metabolic risks in young asymptomatic healthy individuals.

3 III.

4 Material & Methods

Four hundred and fifty-four young adult people had been included in the study (males=352 and females=102). All these young asymptomatic healthy individuals were subjected to history, examination and biochemistry including blood sugar and lipid profile between 1 st January 2008 to 30 th December 2008 as a prerequisite for joining various IT / BT companies. The study included a sample of subjects with an age group of 21-30 years.

5 a) The studied variables

The data on each participant covered the following areas: a. Medical history, family history of diabetes, hypertension, asthma, etc., smoking habits, alcohol. b. Measurement of BMI: Standing height without shoes was measured to the nearest 0.5 cm using a stadiometer attached to the weighing scale. Body weight was measured with light clothes as possible on a calibrated scale to the nearest 0.5 Kg. BMI was then calculated using Quetlet index (weight kg / height m 2) to find out the obesity among participants. c. Physical examination includes measurement of blood pressure in a sitting position. Two measurements were taken and the value that was used was the mean bloodpressure. d. All participants were requested to fast for 12 hours before blood samples were drawn. Blood samples were taken and were examined either immediately or within 2 hours for determination of total cholesterol, triglycerides, LDL, HDL, blood glucose measurements that include both fasting blood sugar and post prandial blood sugar values. Dyslipidemia risk and impaired blood sugar levels were determined as per National Cholesterol Education Program (NCEP) -Adult Treatment Panel III guidelines 7 and American Diabetes Association 8 respectively. Obesity classification based on BMI was as per the WHO Asiapacific criteria. 9 NCEP -Adult Treatment Panel III guidelines: According to these guidelines, hypercholesterolemia is defined as TC >200mg/dl, hypertriglyceridemia as TG > 150mg/dl and low HDL-C as < 40mg/dl. Dyslipidemia is defined by presence of one or more than one abnormal serum lipid concentration. For serum glucose levels, we referred to American Diabetes Association (ADA) guidelines. Subjects with fasting blood glucose >100mg/dl were considered as having impaired blood glucose levels. According to the Framingham risk calculator the following four factors are considered as risk factors. Risk factors included total cholesterol, systolic blood pressure, cigarette smoking, and diabetes. Risk categories are classified as low, moderate, moderately high and high risk.

IV. No. of non-smokers (males) 72% Study constituted four hundred and fifty four subjects of which 61.5% were males and 38.5% were females. Other patient characteristics included (Table 1)

6 Observations & Results

7 b) Obesity

As per Indian Council of Medical Research (ICMR), 22% of subjects were overweight while 40% of subjects were obese. The male to female ratio for obesity was 2.1: 1. (Figure 1) carbohydrate tolerance, 16% had a positive family history of diabetes, 14% had associated hypertension and 35% had dyslipidemia.(Figure 2) Most alarming abnormality was in lipid profile at 46% (Figure **??**). Dyslipidemia was 3.3 times more common in males. Of the 21% people with abnormal carbohydrate tolerance 35% had associated dyslipidemia. Amongst people with hypertension 60% had abnormal lipid parameters. Of the cohort, only 44% had all lab parameters (blood sugars and cholesterol) in normal range. Resting ECG was recorded by 12 LEAD ECG and was normal in all cases.

8 Figure 3 : Dyslipidemia

9 Discussion

This study was taken to validate the preemployment medical checkups done for assessment of the cardiometabolic risk factors in young individuals. The study reveals that incidence of hypercholesterolemia, hypertriglyceridemia, hypertension, blood sugar, obesity and abnormally high LDL-C and low HDL-C levels which are well-known risk factors for cardiovascular diseases occur in young patients. The results are consistent with Sawanth et al, where 80% of the subjects showed at least one abnormal parameter but the cohort age group ranged from 20 to 40 yrs old. 10 Dysglycemia was noted in 34.1% males as compared to 22.1% females. Dyslipidemia was noted in 80% of their population, but they noted high LDL as the most common abnormal lipid parameter (74.3%), we had observed hypertriglyceridemia as the commonest abnormality. Our reports also are consistent with another study done in selected industrial population where in increased prevalence of dyslipidemia in young adults was found to be one of the major contributors of CVD. 11 Risk factor reduction is of major importance in young patients, as young patients, however, are more likely than older patients to be smokers, male, obese, and to have a positive family history. The diet in young patients may also attribute to such risk. According to Leino et al., cardiovascular risk factors of young adults are related to parental socioeconomic status. The diet of young adults from farming families and from rural areas contained more saturated fatty acids and less monounsaturated and polyunsaturated fatty acids.

Also, subjects with the highest parental occupational status smoked less compared with those with the lowest status. 12 Elizabeth et al., reported that risk of CVD can be decreased by adhering to dietary and lifestyle

modifications which results in lower risk factor levels. **??**3 It has also been observed that compared to the Western population a relatively low level of cholesterol appears to predispose Indians to CAD. 14 Higher percentage of risk for ASCVD is observed in males compare to the females.

A potential weakness of this algorithm is that it is based on estimated risk from age 50. However, it can reasonably be assumed that an individual's risk factors (other than age) will remain constant throughout middle age and into older years.

10 VI.

11 Conclusion

Cardiometabolic risk factors are breaking the age barrier. We Indians have risk of CAD occurring at a much younger age due to the genetic factors, life style and deranged metabolic factors as compared to the Caucasians. Prevention and early recognition and intensive treatment are the best options to reduce the morbidity and mortality. "Catch them young" should be the dictum. Indian dyslipidemia is unique and it termed atherogenic dyslipidemia with higher incidence of hypertriglyceridemia and LDL cholesterol and very low levels of HDL. We recommend blood sugar and lipid analysis apart from physical examination at predefined intervals in young healthy asymptomatic individuals. We can take the advantage for pre-employment health check in young adults to unfold such abnormalities and initiate therapeutic methods at an early stage, to stall the progression in to cardiovascular disorder -up holding the traditional method of 'Prevention is better than Cure'. [1]

1

Figure 1: Figure 1 :

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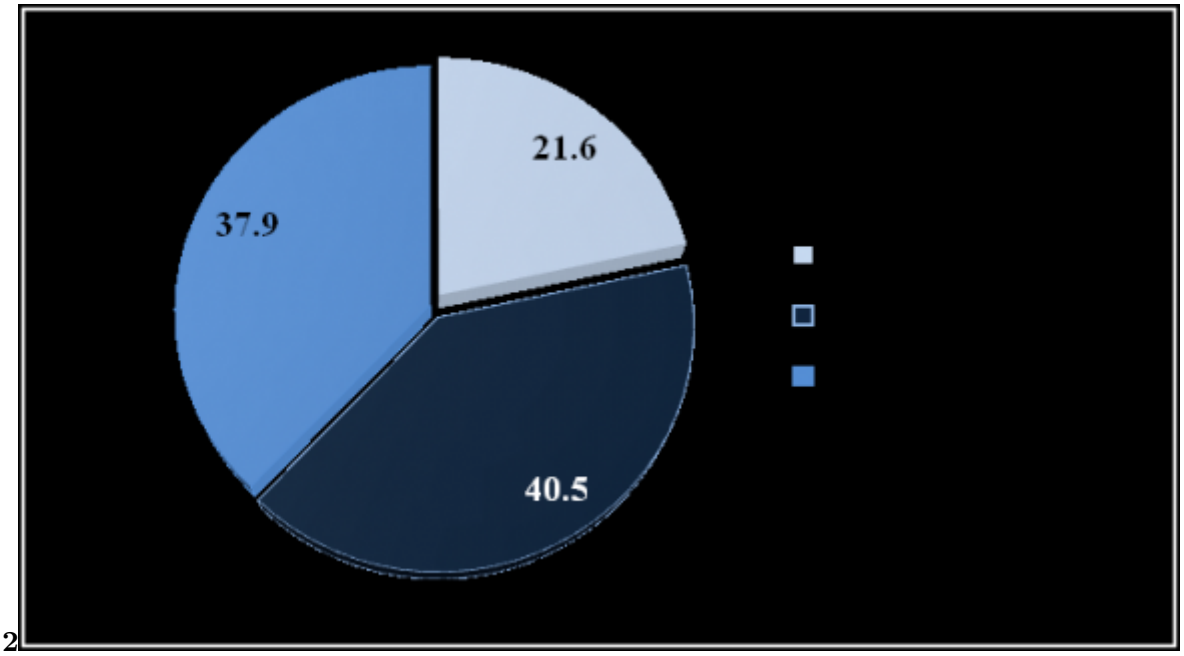

2

Figure 2: Figure 2 :

1

No. of males	61.5%
No. of females	38.5%
Mean age	26 years
Patients with family history of cardio-metabolic risk	34%
Patients with no family history of cardio-metabolic risk	66%
No. of smokers (males)	28%

Figure 3: Table 1 :

2

Risk category	Number (N)	Percentage (%)
Males with low risk	N=30	8.522
Males with high risk	N=322	91.47
Females with low risk	N=19	19.19
Females with moderate risk	N=42	42.42
Females with moderately high risk	N=36	36.36
Females with high risk	N=2	2.02

Figure 4: Table 2 :

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