Prevalence of Coronary Heart Disease in different socioeconomic status: Is dyslipidemia a future threat?

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Abstract

Background: Dyslipidemia is an abnormal amount of lipids in the blood. In developing countries, most dyslipidemias are hyperlipidemias , an elevation of lipids in the blood, may be due to diet and lifestyle**.** The present study aimed to assess the prevalence of coronary heart disease risk factors like dyslipidemia and educational level in different socioeconomic classes.

Methods: This study was conducted in Central Laboratory Dhiraj General Hospital, Vadodara, Gujarat, India. In a time based cross sectional study 206 participants were randomly selected from collection center for lipid profile determination. Desired information regarding socio-demographic data and education were collected by self-structured questionnaire after taking informed consent.

Statistical Analysis: Single factor one way ANOVA was used for group difference and alpha error was set at 5% level.

Results: Parameters like total cholesterol (TC), low density lipoprotein (LDL), triglyceride (TG) and high density lipoprotein (HDL) level were studied. TC, LDL and TG level were significantly different in all classes (p <0.001), found to be high in rich class than other two. ANOVA showed HDL insignificantly different in all classes.

Conclusion: In conclusion our findings evidenced, higher social classes with dyslipidemia may have greater CHD risks than lower social classes. This may be due to their sedentary lifestyle. Diet modification and less physical activity may play a key role.

Keywords: dyslipidemia, lipid profile, socioeconomic status

1.Introduction

Cardiovascular risk factors can be categorized into independent factors include age, gender and family history and dependent factors include smoking, hypertension, lipid disorders, diabetes, overweight, improper dietary habits and stress. However, the results from the INTERHEART study conclusively established the role of behavioral and conventional risk factors in the prediction of CHD risk among Indians.[1][2]

Social and economic inequalities have been shown to be associated with health problems in general. Prevalence of CHD is around 3-4% in rural areas and 8-10% in urban areas because of changing lifestyles, less physical activity, dietary habits and more stressful life. Six fold rises in CHD is reported in urban areas between the years 1960 and 2000.[3]Studies from rural areas have demonstrated a lower Prevalence compared to studies from urban areas. [4-7]

Author is keen to evaluate the prevalence of CHD risk factors in different socioeconomic population of Vadodara city in Gujarat, India.

2. Materials and Methods

It was time based cross sectional study undertaken after ethical approval from SVIEC (SVIEC/ON/MEDI/RP/13121). Study duration was 6 months (15 Sep 2013 to 15 Feb 2013), based on the secondary data available in Central Laboratory Dhiraj General Hospital. In this cross sectional study 206 participants were randomly selected from collection center of central lab where the blood samples collected for lipid profile determination. Only those who have already prescribed the lipid profile test were recruited in the study.

All participants were selected on the basis of following inclusion and exclusion criteria's.

Inclusion criteria's:

1. Aged between 30-60 yrs
2. Should live in Vadodara city from last 5 yrs.
3. Volunteered for study.

Exclusion criteria's:

1. Those who were taking Lipid lowering drugs.
2. Pregnancy

After inclusion an informed consent has been taken from all subjects and they have given a brief idea about the purpose and methodology of the study. Following informed consent each participant were subjected to the baseline parameters like weight, Height, BMI and blood pressure. After basic parameters all subjects were interviewed for a self structured questionnaire covering parameters such as demographic data, education, monthly income of family and the area they belongs to. Their lipid profile were taken including TC, TG, VLDL, HDL, and LDL. Estimation was done with the help of automatic digital analyzer.

3. Results

Table-1 shows the socio-demographic characteristics of the study population. Among 206 total study subjects 112 (55%) were male and 94 (45%) were females. Table-2 reveals lipid profile level in all socio-economic classes. One way AVOVA test was done for statistical analysis and alpha error was set at 5% level. Table-2 also showed the F-crit and F values. Parameters like TC, LDL and TG are found to be more in rich class than other two and significantly different in all classes. HDL was found to be less in poor class and ANOVA showed significant difference in all classes.

Table-1: Percentage Distribution of the Respondents by Socio-demographic Characteristics (N=206).

Variables	No. of subjects	% subjects
Age (years)		
30 – 39	33	16.0%
40 – 49	75	36.4%
50 and above	98	47.6%
Sex		
Male	112	55%
Female	94	45%
Education level		
Illiterate	95	46.1%
School	72	34.95%
College and above	39	18.9%
Economic Class		
Poor Class	98	47.57%
Middle class	75	36.40%
Rich class	32	15.53%

Table-2: Lipid profile level in all socio-economic classes

Parameters (mg %)	poor class	Middle class	Rich class	ANOVA P' value
Total cholesterol	148.5 ± 7.9	157.477±14.2	183.3±23.9	P' value <0.001 F crit -3.040, F-71.82
HDL	39.5±6.820	42.96±6.3	42.87±7.5	P' value- 0.020 F crit -3.0406, F-6.38
LDL	86.5±23.9	84.9±18.1	105.9±18.6	P' value <0.001 F crit -3.040, F-12.16
Triglyceride	110.0±16.2	127.5±12.89	135.2±18.78	P' value <0.001 F crit -3.040, F-71.82

4. Discussion

The prevalence of CHD is rising rapidly and India would lead the world in the next 15 years.[8][9][10] The symptoms and signs of CHD are noted in the advanced state of disease. Most individuals with coronary artery disease show no evidence of disease for decades as the disease progresses before the first onset of symptoms, often a sudden heart attack, finally arises. Rapid epidemiological transition with increasing life expectancy and sociological changes of acculturation could be the main reason for the accelerating CHD epidemic in India and this transition determines the socioeconomic gradient associated with the prevalence of CHD.[11][12] In the developed world, increased awareness and education about diet and lifestyle risk factors may have been partly responsible for the decline in CHD prevalence among the higher social classes.

The findings of our study showed that coronary risk factors such as dyslipidemia which include hypercholesterolemia, hyper triglyceridemia

and high LDL were more prevalent among higher SES groups. Dyslipidemia secondary to obesity were seen more among urban residents compared to their rural counterparts may be due to more fast food consumption with carbonated soft drinks, sedentary life style and less physical activity.[13] Epidemiological data from other South Asian countries have also confirmed the association of urbanization with CAD.[14] However, there is a paucity of data comparing different socioeconomic groups within an urban environment, which earlier tended to consider as a uniform group. Rapid industrialization and urbanization have brought about enormous changes in dietary patterns include the irregular diet habits with fast food consumption and stressful lifestyle.[15][16] This is most obvious among higher SES groups, which tend to experience a greater prevalence of CHD risk factors.[17][18]

Most of the participant were of age 50 or above (N=98, 47.6%), whereas other respondents aged between 40-49 and 30-39 years (36.4% and 16% respectively), it is clear that majority of persons are from old age.[19] In our study education is a key detriment of life and status of an individual. Despite the improvement in the educational status, level of education still remain low in our study which correlates with other study of rural population in India.[20] Table I showed that 46.1% are illiterate, while 34% around are educated up to school level. Our study was done in hospital of rural tertiary and mostly participants found poor. Percentage of high socioeconomic class is low compared to poor class, found significantly high serum level of TC, TG, and LDL except HDL.[21][22]

We found insignificant difference in HDL, also known as good cholesterol, of all socioeconomic classes. However, the prevalence of low HDL cholesterol levels was higher among the low income group, may be due to their smoking habits.[23] Some of the studies were found high HDL value in poor class. We believe that the professional occupation of rural individuals, most of who are agriculturists, with high caloric expenditure activities may justify these results.[24]

Exercise is found to be clearly associated with a decreased risk of CHD and helpful in cardiac rehabilitation[25] Dyslipidemia may be high in rich class due to less physical activity secondary to busy schedule and fast life, more intake of saturated fatty acid and less awareness of CHD.[23][26][27] It is also found that rural people engaged in farming, labor and other modes of vigorous physical works, were less likely to develop CHD than people with sedentary occupation which is correlated with our study.[28][31]

Though prevalence of CHD among the study population appears to be significant, less number of subjects from higher socioeconomic class is limitation of our study. Future extension of this type of study should take into consideration to explore additional risk factors including exercise and dietary patterns.

5. Conclusion

In conclusion our findings evidenced, higher social classes with dyslipidemia may have greater CHD risks than lower social classes. Socioeconomic factors and Rapid growth in industrialization and urbanization may led to changes in dietary patterns, stressful and sedentary life style. This underscores the need for planning a program to prevent the epidemic of CHD in India, especially targeted at the middle and higher income group. Regular monitoring of lipid profile should be considered more frequently as the age increases. Awareness regarding the CHD and its correlated risk factors should also be increased in all socioeconomic class through various modalities like media and other local modes.

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