Original Research Article

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Ten years risk assessment of cardiovascular events among adult population visiting urban health and training centre of a tertiary care institution, Farrukhabad, Uttar Pradesh, India

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ABSTRACT

Background: Cardiovascular diseases (CVDs) are the number one cause of death globally, four out of five CVDs deaths are due to heart attacks and strokes, and one third of these deaths occur prematurely in people under 70 years of age. In view of above background study conducted with the aim and objective to determine Ten years risk assessment of cardiovascular events (myocardial infarction or stroke) among adult population visiting UHTC of a tertiary care Institution, Farrukhabad, UP, India.

Methods: A cross-sectional study was conducted using World Health organisation (WHO)/International Society of Hypertension (ISH) tool at urban health and training centre (UHTC) of a tertiary care institution at Farrukhabad, UP from August 2017 to January 2018. Sample size was 400 (n=4pq/l²). Ethical clearance was obtained from institutional ethical committee and written informed consent obtained from the participants. Data analysed using SPSS Software. Chi-square test used to observe level of significance at p<0.05.

Results: Majority (69.5%) have less than 10% risk for CVD whereas 10.5% have 10-20% risk, 8% people have 20-30% risk, 6.25% have 30-40% risk and 5.75% people have \geq 40% risk. Majority (58.75%) belong to young adult. About 7.75% people were diabetic and 11.25% were smoker. Concerning serum cholesterol, 49% had 5 mmol/l, 42% had 4 mmol/l, 0.75% had \geq 8 mmol/l. Statistically significant association observed between socio-economic status (SES) and cardiovascular event when chi-square is 95.344, and p<0.00001.

Conclusions: About 1/3 population have risk above 10%. Mostly middle-income group are on risk.

Keywords: Cardiovascular diseases, WHO/ISH chart, Ten year risk prediction, Adult population

INTRODUCTION

Epidemiological transition has shifted world from communicable to non-communicable diseases. Cardiovascular diseases (CVDs) are the number one cause of death globally, taking an estimated 17.9 million lives each year. These diseases tend to affect patients in the most productive years of their lives and result in catastrophic social and economic loss. Four out of five

CVDs deaths are due to heart attacks and strokes, and one third of these deaths occur prematurely in people under 70 years of age. This unwanted avoidable premature death can be avoided with life style modification and encouragement of people towards positive and healthy life which help to achieve the Sustainable development Goal (SDG) of good health and well-being by 2030. In view of above background present study has been conducted with objective to assess 10-year risk of a fatal or non-fatal cardiovascular event.

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METHODS

A cross-sectional observational study was conducted on 400 subject, aged 40 yrs and above who visited at urban health and training centre (UHTC), Farrukhabad, UP of a tertiary care institution from August 2017 to January 2018 using WHO/ISH 10 years risk prediction tool for CVD.2 These charts indicate 10-year risk of a fatal or non-fatal major cardiovascular event (myocardial infarction or stroke), according to age, sex, blood pressure, smoking status, total blood cholesterol and presence or absence of diabetes mellitus.² Sample size calculated using statistical formula 4pg/L². Where p=50%, q=100-p, L=allowable error (taken 10% of p). Ethical clearance was obtained from Institutional Ethical Committee (IEC) and written informed consent obtained from the participants and purpose of study explained to them in their own local language and ensured them about confidentiality of their identification. Data was analysed using SPSS Software and Chi-square test used to ascertain level of significance at p < 0.05.

Inclusion criteria: Those age 40 years and above and willing to participate in study.

Exclusion criteria: Age below 40 years and not willing to participate in study.

RESULTS

Study shows majority (69.5%) people have <10% risk for CVDs whereas 10.5% have 10-20% risk, 8% people have 20-30% risk and a significant proportion (6.25%) have 30-40% risk and 5.75% people have ≥40% risk (Figure 1). Data reveals M:F ratio about 0.54, majority (58.75%) belong to young adult, although small but significant proportion 12.75% belong to elderly age group. About 7.75% people were diabetic and 11.25% were smoker. With respect to total serum cholesterol, 49% had 5 mmol/l whereas 42% had 4 mmol/l, only 0.75% had serum cholesterol >8 mmol/l. A large section (67.25%) have SBP between 120-140 mm of Hg, 20.25% have between 140-160 and 10.25% between 160-180. Only 2.25% had SBP ≥180 mm of Hg (Table 1). Study shows majority of subject among study population belong to middle socioeconomic status (63.5%) followed by lower (20.75%) and upper class (15.75%). Present study shows statistically significant association between socioeconomic status and cardiovascular event when chisquare is 95.344, and p<0.0001. Among population had risk ≥40% majority (60.86%) belong to middle SES whereas among (risk group 20-40%) majority belong to lower SES (Table 2).

Table 1: Distribution of variables among study subjects as per criteria of WHO/ISH for CVDs.

Variables	N (%)
Gender	
Male	216 (54)
Female	184 (46)
Age (years)	
40-50	235 (58.75)
50-60	114 (28.5)
60-70	36 (09)
≥70	15 (3.75)
Diabetes mellitus	
Diabetic	31 (7.75)
Non-diabetic	369 (92.25)
Smoking	
Smoker	45 (11.25)
Non-smoker	355 (88.75)
Total cholesterol (mmol/l)	
4	168 (42)
5	196 (49)
6	27 (6.75)
7	6 (1.5)
≥8	03 (0.75)
SBP (in mmhg)	
120-140	269 (67.25)
140-160	81 (20.25)
160-180	41 (10.25)
≥180	09 (2.25)

<10% 10-20% 20-30% 30-40% ≥40% **Total** SES N (%) N (%) N (%) N (%) N (%) N (%) 40 (14.38) 6 (14.28) 8 (34.78) 63 (15.75) Upper 4 (12.5) 5 (20) Middle 19 (45.23) 14 (60.86) 254 (63.5) 207 (74.46) 6 (18.75) 8 (32) 31 (11.15) 17 (40.47) 22 (68.75) 12 (48) 1 (4.3) 83 (20.75) Lower Total 42 32 25 400 278 23

Table 2: Distribution of risk categorization of CVDs with SES of study subject.

 $\chi^2 = 95.344$, df (8), p<0.00001.

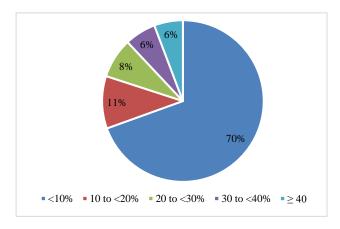


Table 3: Risk distribution of CVDs among study subject.

DISCUSSION

Present study shows majority (69.5%) people have <10% risk for CVDs whereas 10.5% have 10-20% risk, 8% people have 20-30% risk and a significant proportion (6.25%) have 30-40% risk and 5.75% people have $\ge 40\%$ risk. Similar findings were observed by Premanandh et al. They distributed their participant into low (<10%), moderate (10% to <20%), high (20% to <30%), and very high (>30%) risk groups. Moderate and high CVDs risk was 12.14% and 7.5% respectively, whereas very high risk (>40%) group were only 2.5%, which is almost half of present study findings (6.25).3 Islam et al, in their study observed that majority of adults (85.2%, 95% CI 84.3 to 86.1) have a 10-year CVD risk of less than 10%. The proportion of adults with a 10-year CVD risk of ≥20% was 0.51%. Only one adult was categorised with a 10-year CVD risk of ≥30%.⁴ In another study, among 22,093 participants, 6,455 (29.2%) had high cardiovascular risk, estimated 10-year CVD risk of ≥30%. The prevalence of high CVD risk was greater in urban (31.6%, CI 30.7-32.5%) than in semi-urban (28.7%, CI 27.3-30.1%) and rural areas (26.2%, CI 25.2-27.2%).5 Ghorpade reported seventeen percent of the study participants having moderate to high risk for the occurrence of cardiovascular events by using WHO/ISH risk prediction charts in a study done in rural population of South India.6

In contrast a study conducted in rural Punjab to estimate cardiovascular risk by Vikramaditya et al, reported 19.1% of the study population having moderate risk (10-20%)

and 16% of the population having high risk (>20%) using WHO/ISH risk prediction chart.7 Another study at Mongolia, Malaysia and Cambodia, reveals prevalence of "high CVD risk" (≥20% chance of developing a cardiovascular event over 10 years) was 6%, 2.3% and 1.3% respectively. Of those at "moderate risk" (10≤20% chance of developing a cardio vascular event over 10 years), 100%, 94.3% and 30.1%, respectively are affected by at least one risk-increasing factor. Of all individuals, 44.6%, 29.0% and 15.0% are affected by hypertension as a single risk factor (systolic ≥140 mmHg or diastolic ≥90 mmHg or medication).8 Prevalence of high total CVD risk was estimated to be less than 10% in people aged 40 or over in eight LMIC countries: China 1.1%, Iran 1.7%, Sri Lanka 2.2%, Cuba 2.8%, Nigeria 5.0%, Georgia 9.6%, Pakistan 10.0%. Another study in Seychelles reported 5.1% of population (40-64-year-old) with high total CVDs risk in 2004.10

Present study reveals M:F ratio about 0.54, majority (58.75%) belong to young adult, although small but significant proportion 12.75% belong to elderly age group. Male had more (57.14%) risk compared to female (42.85%) when risk is 10 to 20%. Whereas in severe (20-40% risk) and very severe (≥40%) risk group, male and female had almost equal risk. In another study more male (16.12%) than female (8.97%) had moderate risk. Likewise, more men (4.5%) than women (4.2%) were at high CVD risk. Out of total medium and high CVD risk individuals, 56.36% were males. This may be due to higher prevalence of smoking (15.3%) in males. Similar trend was reported in a study conducted in Mumbai and Bangaluru. More women than men were found to be at low risk for CVD by all the risk scoring tools. 11

CONCLUSION

Thus, it was observed that, about 70% population had less than 10% risk for CVD. Middle income group had more risk comparison to other group. This study gives way for further study, impact of life style modification on CVD Risk. A small intervention at primary level may achieve a big gain by change in attitude towards modifiable risk factor.

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Institutional Ethics Committee

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