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Original Research Article

An Epidemiological Study to Detect Prevalence of Cardiovascular Diseases Risk Factors among Wives of Army Personnel

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ABSTRACT

Background: Cardiovascular diseases (CVDs) among women are of immense public health importance world-over, and the importance is rising in developing nations including India. There is lack of studies on prevalence of cardiovascular risk factors in women, and no study has been carried out among wives of Armed Forces personnel.
Aims & Objectives: The present study was conducted to determine the prevalence of risk factors for CVDs among wives of Army personnel with an aim to plan evidence based preventive strategy for the target population.
Material & Methods: A cross sectional study recording history, anthropometric measurements, physical examination and biochemical tests to detect modifiable risk factors among the study population.
Results: The study revealed that 151 out of 313 women aged 30 years and above had at least one risk factor for CVDs. Physical inactivity (30.67%) and overweight/ obesity (17.25%) were the commonest risk factors, followed by high total cholesterol (9.90%). High blood pressure was detected in 19 (6.07%). Prevalence of high blood glucose was identified in 3.19% of the participants. Exposure to second hand smoke was 6.71%, while 4.47% of women gave positive history of CVD in the family, and 2.88% had chronic stress.
Conclusion: The study demonstrates that behaviour change communication mainly to decrease overweight/obesity; increase leisure-time physical activity and diet modifications will go a long way to decrease the prevalence of risk factors, and impact of CVDs in spouses of Armed Forces personnel.

Key Words: Cardiovascular diseases, Risk factors, Prevalence, Women, Army Personnel

INTRODUCTION

Cardiovascular diseases (CVDs) among women are of immense public health importance world over. CVDs are responsible for 8.6 million women deaths each year, accounting for one- third of total deaths in women. The mortality among women due to heart diseases and strokes is more than due to all cancers, tuberculosis, HIV/AIDS and malaria combined. [(1, 2)] Risk factors for heart disease and stroke are largely the same for men and women. Factors such as age and family history play a role, but majority of morbidity and mortality in CVDs is due to modifiable risk factors i.e. obesity, smoking, exposure to second hand smoke, high raised blood lipids, unhealthy diet, physical inactivity,

raised blood pressure and high blood glucose. [3-8] In addition, use of oral contraceptives, and certain complications during pregnancy e.g. pre-eclampsia or gestational diabetes increase the risk of early cardiovascular disease and death among women. [9]

CVDs are health as well as developmental issues in low and middle income countries. Eighty percent of the world's deaths from CVDs occur in these nations. Due to economic growth and changing life styles, risk factors like overweight/obesity, physical inactivity and diets rich in calories-sugars-salts are on the rise in developing nations. People in low and middle income countries are more exposed to risk factors such as tobacco. At the same time they do not have the benefit of prevention programmes, as compared to populations in high-income countries. [9] At macro-economic level, CVDs place a heavy burden on economies, and it is estimated that non-communicable diseases including cardiovascular diseases and diabetes reduce GDP by up to 6.77% in low- and middle-income countries. [10] According to World Health Report, CVD will be the largest cause of death and disability in India by 2020.[11] Indeed, evidence of this epidemiological transition is already evident in urban, semi-urban and slum dwellings in India, where unhealthy life styles are contributing to rising prevalence of risk factors for CVD. [12]

The present study was conducted to identify prevalence and distribution the risk factors among wives of serving soldiers in three large military stations with the objective of quantifying the burden of 'risk factors' to plan preventive strategy tailored for the target population.

MATERIALS AND METHODS

A cross-sectional study was conducted on World Heart Day 2012 at three large military stations. The target population was wives aged 30 years and above of serving personnel of Indian Army present in the stations during the period of study. Known patients of diabetes mellitus, hypertension, dyslipidemia, hypothyroidism and coronary heart disease were included in the study. After obtaining informed consent, data regarding personal identification, relevant history, anthropometric measurements and blood pressure were recorded on a pre-tested schedule. Fasting blood sample (venous) was obtained for biochemical analysis.

The history included present symptoms, past illness, family history of CVD, physical exercise, smoking or exposure to second hand smoke at home or work-place and chronic stress. Height and weight of lightly clothed subjects were measured to the nearest cm and 0.5 kg, respectively. The body mass index (BMI) was calculated as weight in kilograms/square of height in meters. Left arm systolic and diastolic blood pressure in sitting posture was recorded using mercury sphygmomanometer and stethoscope. Only one reading was taken unless the reading was more than 140/90 mm of Hg when a second reading was recorded after a relaxation period of minimum five minutes. Known hypertensives, diabetics and dyslipidaemics on diet control/medication, even with normal readings were included as having the risk factor(s). A fasting blood sample was collected from all participants for the determination of fasting blood glucose (FBG) and total cholesterol. Estimation of FBG and total cholesterol was done by semi-auto analyzer under the supervision of pathologist. Data was compiled on Windows EXCEL spread-sheet and statistical analysis was done using Epi info Version 3.5.4.

RESULTS

A total of 313 women were screened during the study. The age profile of participants is mentioned in Table 1.

Table 1: Age distribution of Participants.

Age	Number of participants (N = 313)	Percentage
30-35	120	38.34
36- 40	128	40.89
41-45	48	15.34
46-50	15	4.79
> 51	2	0.64
Total	313	100.00

Table 2 : Prevalence of Risk Factors

Number of risk factors present	Number of women N= 313	Percentage
1	76	24.28
2	51	16.29
3	19	6.07
4	5	1.60
Total	151	48.24

The screening and follow-up investigations revealed that 151 (48.24%) of participants had one or more risk factors. A large proportion (23.96%) of women had multiple risk factors (Table 2).

Physical inactivity (30.67%) and overweight/ obesity (17.25%) were the commonest risk factors, followed by high total cholesterol (9.90%). High blood pressure was detected in 19 (6.07%), while prevalence of high blood glucose was identified in 3.19% of the participants. Smoking was rare, but exposure to second hand smoke in 6.71% was high enough to deserve consideration during planning of preventive strategy. Fourteen (4.47%) of women gave positive history of CVD in the family, while 2.88% had chronic stress. The 'operational definition' of each risk factor and prevalence of risk factors among the participating women is tabulated in Table 3, while Table 4 describes the distribution of risk factors as per age-grouping among 151 women.

Table 3: Prevalence of Risk Factors for CVD

Risk Factor	Definition/Cut off point	Number of participants with risk factor N = 313	Percentage
Family history of CVD	First degree relative had coronary heart disease or stroke before the age of 55 years (for a male relative) or 65 years (for a female relative)	14	4.47
Smoking	Current	01	0.32
Passive smoking	Exposure to second hand smoke at home or/and workplace	21	6.71
Physical inactivity	Leisure time physical activity of less than 30 minutes on less than 4 days in a week	96	30.67
Overweight	BMI > 25, <30	41	13.10
Obesity	BMI > 30	13	4.15
Chronic Stress	Subjective	09	2.88
High Blood Pressure	SBP > 140 or DBP > 90 Or a known hypertensive on medication	19	6.07
High blood sugar	Fasting blood sugar > 126 mg/dL or a known case of Diabetes mellitus	10	3.19
High serum cholesterol	Serum Cholesterol > 200 mg/dL	31	9.90

The prevalence of risk factors as per age is shown in Table No 4.

DISCUSSION

Studies on prevalence of risk factors of CVDs in India are few. [(11)] While no study has been undertaken to study the prevalence among wives of Indian Army personnel, some of the studies undertaken in India have included only males as study subjects. [(12-15)] The results of various studies

including the present study depicting behavioral, anthropometric and biochemical risk factors for cardiovascular diseases among women in India are tabulated in Table 5.

Table 4 : Prevalence of Risk Factors as per Age

Age group	Number of participants (N=313)	Family history of CVD	Smoking and Passive smoking	Physical inactivity	Overweight & obesity	Chronic Stress	High Blood Pressure	Diabetes	High serum Cholesterol
30-35	120	5 (4.17)	8(6.67)	36 (30.00)	11 (8.33)	3 (2.50)	3 (2.50)	2 (1.67)	5 (4.17)
36-40	128	6 (4.69)	9 (7.03)	43 (33.59)	16 (12.50)	4 (3.12)	6 (4.69)	2 (1.56)	8 (6.25)
41-45	48	2 (4.16)	4 (8.33)	12 (25.00)	19 (39.58)	1 (2.08)	6 (12.50)	4 (6.25)	11 (22.91)
46-50	15	1 (6.67)	1 (6.67)	4 (26.67)	7 (46.67)	1 (6.66)	3 (20.00)	2 (13.33)	6 (40.00)
> 50	2	-	-	1 (50.00)	1 (50.00)	-	1 (50.00)	-	1 (50.00)
Total	313	14 (4.5)	22 (7.0)	96 (30.7)	54(17.25)	9(2.88)	19(6.07)	10(3.19)	31(9.90)
Chi square test for trends		P= 0.38	P= 0.33	P= 0.35	P < 0.001	P= 0.32	P < 0.001	P < 0.001	P < 0.001

Note: 1. Figures in parentheses reflect percentages.
2. Findings in row 5 have been clubbed with row 4 for calculation of P values.

Table 5: Comparison of finding of various studies conducted in India to study prevalence of CVDs risk factors in women

Characteristic	Present study	ICMR-WHO Six-site study [16]			Gupta et al [17]	Anand et al [18]	Gupta et al [19]
Location	Military Stations	Urban	Rural	Slum/ Peri-urban	Urban	Urban	Urban
Year of study	2012	2010	2010	2010	2007	2003-04	2002
Family history of CVDs	4.47	-	-	-	-	-	-
Smoking	0.32	0.7	4.3	2.7	2.2	7.0	11.7
Exposure to second hand smoke	6.71	-	-	-	-	-	-
Physical inactivity	30.67	61.0	37.0	39.7	11.3	55.0	22.7
Overweight	13.10	27.7	11.5	19.6	16.9	21.9	-
Obesity	4.15	11.1	2.5	6.5	61.3	-	30.2
Hypertension	6.07	25.7	20.6	22.7	48.9	15.8	37.5
High total cholesterol	9.90	32.8	26.4	23.4	39.5	-	4.1
High blood sugar	3.19	10.3	5.7	9.6	21.1	-	11.3
Chronic stress	2.88	-	-	-	-	-	-

Note: Data regarding risk factors in women from the published studies [16-19] have been included in Table No 5.

In general, prevalence of risk-factors is lower in the study population as compared to results of other studies. Lower age profile of women in Armed Forces and availability of comprehensive health services through Armed Forces Medical Services are likely to be responsible for the differences. Statistically significant age-associated increase in prevalence of hypertension, obesity, diabetes and high cholesterol, as detected in this study is collaborated by similar trend reported by other studies. [17, 19] The authors were surprised by higher prevalence of physical inactivity among women aged 30-40 as compared to higher age groups, till a qualitative study on sub-sample revealed that women in 30-40 age-group have less leisure-time due to relatively younger children who require longer periods of supervision by their mothers.

CONCLUSION

Behavioural, anthropometric and biochemical risk factors for CVDs are well recognized. So is the importance of primordial, primary and secondary prevention through population, high risk and individual approaches. The efficacy of intervention programme at community level can be increased if the strategies are 'tailor-made' based on 'prevalence of risk factors' in the target population. The present study

demonstrates that behaviour change communications of women, mainly to decrease overweight/obesity, increase leisure-time physical activity and diet modifications will go a long way to decrease the prevalence of risk factors, and impact of CVDs in spouses of Armed Forces personnel. Prevention of tobacco use in all forms should be an integral part of the programme, as exposure to second hand smoke has been a well established cause of CVDs among non-smokers. Secondary prevention of hypertension, diabetes and high cholesterol should be ensured to decrease the incidence of CVDs in high risk groups.

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