E-ISSN:2454-9894 P-ISSN: 2454-9886
International Archives of
BioMedical and Clinical Research
(An Official Publication of "Ibn Sina Academy of Medieval Medicine & Sciences")
WWW.IABCR.ORG

Section Medicine | Original Article

Prevalence of Cardiovascular Disease Risk Factors in Postmenopausal Women: A Cross-sectional Prospective Study

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ABSTRACT

Background: *Cardiovascular disease caused by atherosclerosis is rare in premenopausal women; the incidence steeply increases after menopause. Unresolved issue remains if these changes are caused rather by chronological aging or by menopause accompanied by decrease in the estrogen concentration.*
Methods*: This study was conducted during the period of 2 year in one of the rural health centre in Sothern India. This is observational, cross-sectional prospective study. a total of 400 consecutive postmenopausal women (cessation of menstruation for 1 year) were recruited.*
Results*: Mean age at menopause was 48.25 years, mean number of menopausal symptoms was 8.97 ± 3.68, and mean duration since menopause was (MDSM = 3.10 years). Fatigue, lack of energy (80%), cold hand and feet, rheumatology-related symptoms (70%) cold sweats, weight gain, irritability and nervousness (60%), palpitation of heart, excitable/anxiety (40%) each were common complaints. Hypertension was diagnosed or a person was a known hypertensive (72%). Diabetes was diagnosed, or a person was known diabetic in 37%. BMI 25 kg/m2 in 65%. Truncal obesity with WHR > 0.8 in 59% females, whereas abdominal obesity with waist size >88 cm was in 54% women.*
Conclusions*: In postmenopausal women from rural areas high prevalence of most of the conventional CVRFs, especially diabetes, hypertension, dyslipidaemia, obesity, and other risk factors.*

Key words: *Menopause, postmenopausal, hypertension, cardiovascular Disease*

DOI:10.21276/iabcr.2017.3.4.04

Article History
Received: 16.10.17
Accepted: 02.11.17

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INTRODUCTION

Menopause is an event that marks the end of the reproductive phase of a woman. This condition is caused by the reduction of the ovarian function, with gradual decrease of female sexual hormones leading to menstrual cycle interruption. The period after the definite interruption of menstruation, in other words, after the absence of menstrual cycles for twelve consecutive months is characterized by post-menopause.[1] This period, for times, is accompanied by vasomotor, psychological and urogenital symptoms, besides metabolic and cardiovascular alterations, like osteoporosis, cardiovascular diseases and alterations in the distribution of physical fat.[2,3]

Cardiovascular disease caused by atherosclerosis is rare in premenopausal women, the incidence steeply increases after menopause. Unresolved issue remains if these changes are caused rather by chronological aging or by menopause accompanied by decrease in the estrogen concentration. If

Access this article online

Website: www.iabcr.org

Quick Response code

DOI: 10.21276/iabcr.2017.3.4.04

How to cite this article: Leelakumari P. Prevalence of Cardiovascular Disease Risk Factors in Postmenopausal Women: A Cross-sectional Prospective Study. Int Arch BioMed Clin Res. 2017;3(4):13-16.

Source of Support: Nil, **Conflict of Interest:** None

the latter is correct, the change of cardiovascular risk factors around menopause could be critical for the development of atherosclerosis and its complications.[4,5] Despite increasing interest inmenopausal transition and evidence that it is really atherogenic,[6,7] only general recommendations were recently published focused on this period in woman's life[8,9] and only sparse data from reliable longitudinal studies are available [4,5]

CVD is the leading cause of death in India,[10] and its contribution to mortality is rising; deaths due to CVD are expected to double between 1985 and 2015.[11,12] According to the World Health Report of 2002, deaths due to coronary heart disease (CHD) in India rose from 1.17 million in 1991 to 1.59 million in 2000 and 2.03 million in 2010.[13]

A total of nearly 64 million cases of CVD are likely in the year 2015, of which nearly 61 million would be CHD cases (the remaining would include stroke, rheumatic heart disease, and congenital heart diseases). Deaths from this group of diseases are likely to amount to be a staggering 3.4 million.[14]

Cardiovascular mortality in Asian Indian population is likely to climb up 103% in men and 90% in women by 2015.[10]It has been estimated that by 2020, CVD will be the largest cause of disability and death in India, with 2.6 million Indians predicted to die due to CVD.[15,16] It has been predicted that by the year 2020 there will be a 111% increase in cardiovascular deaths in India. It has also been predicted that India would be the heart disease capital in the world by 2020.[17]

By 2020, 2.6 million Indians are predicted to die due to CHD, which constitutes 54.1% of all CVD death.[17] It is increasingly recognized that hormone therapy is inappropriate for older postmenopausal women no longer displaying menopausal symptoms. Both gynaecologists and cardiovascular physicians have an important role to play in identifying perimenopausal women at risk of cardiovascular morbidity and mortality, and should work as a team to identify and manage risk factors, such as hypertension.[18] Although studies[19-20] regarding CVRFs are available in Indian population. However, not much of the information is available regarding the prevalence of CVRFs in postmenopausal women. Hence, this study was undertaken to study prevalence of conventional CVRFs in postmenopausal women.

METHODS

This study was conducted during the period of 2 year in one of the rural health centre in Sothern India. This is observational, cross-sectional prospective study. a total of 400 consecutive postmenopausal women (cessation of menstruation for 1 year) were screened by principal investigator with help of General physician in outpatient department for detailed information regarding common menopausal symptoms, the presence or absence of conventional CVRFs, namely hypertension, diabetes mellitus, dyslipidaemia, obesity, metabolic syndrome, smoking, alcohol, tobacco chewing, and family history of premature heart disease; duration of these CVRFs and any treatment if taken for the same (wherever applicable). Consent form was taken from all the participants.

Height, weight, body mass index (BMI), waist circumference, waist-hip ratio (WHR), blood pressure, and measurement were performed in all. Biochemical tests including fasting and 2-h postprandial blood sugar estimation, fasting lipid profile, and serum uric acid were performed in all. CRP was performed in selected patients who could afford. Physical activity was measured by asking about both work-related and leisure-time activities, and dietary lifestyle was also assessed. Hypertension was diagnosed when systolic BP was ≥140 mmHg and diastolic BP was ≥90 mmHg or a person was a known hypertensive.[19] BMI was calculated as weight in kilograms divided by square of height in meters and overweight and obesity defined as BMI ≥ 25kg/m2 Truncal obesity was diagnosed when WHR >9 in males, and >8 in females while abdominal obesity was diagnosed when waist size >102 cm in men and >88 cm in women as per the US National Cholesterol Education Program (NCEP) guidelines. Dyslipidaemia was defined by the presence of high TC (≥200 mg/dL), high LDL-c (≥130 mg/dL), low HDLc (<40 mg/dL), or high TG (≥150 mg/dL) according to NCEP guidelines.[20] Metabolic syndrome was also diagnosed according to NCEP guidelines when any three of the five identifying risk factors [abdominal obesity, fasting glucose > 110 mg/dL or diabetes, BP ≥ 130/90 mmHg, low HDL-c (men < 40 mg/dL, women < 50 mg/dL), or high TG (≥150 mg/dL)] were present.[20] Physical activity was measured by asking about both work-related and leisure-time activities.[21]

Use of HRT and other drugs were also noted. The same information was collected from the patients' case record sheets. ECG and TMT were advised only in few (wherever applicable). Knowledge regarding their menopause was also assessed.

RESULTS

Mean age at menopause was 48.25 years, mean number of menopausal symptoms was 8.97 ± 3.68, and mean duration since menopause was (MDSM = 3.10 years). Fatigue, lack of energy (80%), cold hand and feet, rheumatology-related symptoms (70%) cold sweats, weight gain, irritability and nervousness (60%), palpitation of heart, excitable/anxiety (40%) each were common complaints. Hypertension was diagnosed or a person was a known hypertensive (72%). Diabetes was diagnosed, or a person was known diabetic in 37%. BMI 25 kg/m2 in 65%. Truncal obesity with WHR > 0.8 in 59% females, whereas abdominal obesity with waist size >88 cm was in 54% women. Dyslipidaemia was seen in 28%. It was defined by presence of high TC (200 mg/dL) in 36%, high LDL-c (=130 mg/dL) in 19%, low HDLc (<40 mg/dL) in 24% or high TG (=150 mg/dL) in 38%. Metabolic syndrome was present in 8%. CRP was found positive in 9 out of 36 assessed patients. Serum uric acid was found >6.5 mg/dL in 7%. The following conditions were noted: smoking (0.2%), alcohol (0.5%), tobacco chewing (7%), and family

history of premature heart disease (11%). Out of 65 patients advised for ECG, 24 were found positive for ischemic changes on ECG and 19 women were advised for TMT and only 2 were found positive for IHD. Risk factor count of more than four was found in 8%. Overall 92% of women were affected by menopause or related problems. [Tables 1,2].

Table 1: Demographic characteristics and clinical presentation

Mean age at menopause	48.25 years
Mean number of menopausal symptoms	8.97 ± 3.68
Mean duration since menopause	3.10 years
Education status	
Literate	28%
Illiterate	72%
Lifestyle	
Active	35%
Hectic	10%
Sedentary	55%
Dietary lifestyle	
Vegetarian	61%
Non-vegetarian	32%
Mixed	7%
Common symptoms	
Fatigue, lack of energy	80%
Cold hand and feet, rheumatic pain	70%
Cold sweats, weight gain, irritability, and nervousness	60%
Palpitation of heart, excitable/anxiety	40%
Affected by menopause or related problems	92%
Not affected	8%

Table 2: Cardiovascular risk factors in postmenopausal women

Hypertension	72%
Diabetes	37%
BMI ≥ 25 kg/m2	65%
Truncal obesity with waist-hip ratio (WHR) > 0.8	59%
Abdominal obesity with waist size > 88 cm	54%
Dyslipidaemia	28%
High TC (≥200 mg/dL)	36%
High LDL-c (≥130 mg/dL)	19%
Low HDLC (<40 mg/dL)	24%
High TG (≥150 mg/dl)	38%
Metabolic syndrome	8%
CRP positive	9/36
Serum uric acid > 6.5 mg/dL	7%
Smoking	0.2%
Alcohol	0.5%
Tobacco chewing	7%
Family history of premature heart disease	11%
Positive for ischemic changes on ECG	24/65
TMT positive	2/19

DISCUSSION

Regarding BMI, significant statistical associations were not observed with severity of menopausal symptoms. Several studies have investigated this correlation, showing convicting results. In 2005, De Lorenzi et al. observed no statistically significant difference between obesity and severity of menopausal symptoms.[22] another study in 2007 confirmed this finding.[23] In 2010, Fernandez-Alonso using different cut off points to diagnose obesity, demonstrated that obese women presented 3.35 times more chances to present moderate to severe symptoms compared with non-obese women ($p<0.01$).[24] A recent Brazilian study demonstrated that obese women reported more symptoms than non-obese women. It was also particularly observed that obese women reported more severe vasomotor symptoms, which are hypoestrogenism-related symptoms.[25] Theoretically, women with higher BMI, had less severe vasomotor symptoms due to the increased estrogen levels via peripheral conversion of and rostenedione.[25] Nevertheless, some studies have shown that actions of adipose tissue, such as thermal isolation, produce higher body temperatures and result in increased vasomotor symptoms, being a possible explanation for association between severe climacteric symptoms and higher BMI.[22,25] Whereas, the present study shows lower rates of these risk factors probably because the study of Kasliwal et al.[19] was conducted in patients undergoing coronary artery bypass surgery with different demographic profile.

The present study shown Mean age at menopause was 48.25 years, mean number of menopausal symptoms was 8.97 ± 3.68, and mean duration since menopause was (MDSM = 3.10 years). Fatigue, lack of energy (80%), cold hand and feet, rheumatology-related symptoms (70%) cold sweats, weight gain, irritability and nervousness (60%), palpitation of heart, excitable/anxiety (40%) each were common complaints. Hypertension was diagnosed or a person was a known hypertensive (72%). Diabetes was diagnosed, or a person was known diabetic in 37%. BMI 25 kg/m2 in 65%. Truncal obesity with WHR > 0.8 in 59% females, whereas abdominal obesity with waist size >88 cm was in 54% women. Dyslipidemia was seen in 28%. It was defined by presence of high TC (200 mg/dL) in 36%, high LDL-c (=130 mg/dL) in 19%, low HDLc (<40 mg/dL) in 24% or high TG (=150 mg/dL) in 38%. Metabolic syndrome was present in 8%. CRP was found positive in 9 out of 36 assessed patients. Serum uric acid was found >6.5 mg/dL in 7%. The following conditions were noted: smoking (0.2%), alcohol (0.5%), tobacco chewing (7%), and family history of premature heart disease (11%). Out of 65 patients advised for ECG, 24 were found positive for ischemic changes on ECG and 19 women were advised for TMT and only 2 were found positive for IHD

This study happens to be one of few studies to be conducted in postmenopausal women. The alarmingly high prevalence of CVRF in rural areas is an eye opener.

CONCLUSION

In postmenopausal women from rural areas high prevalence of most of the conventional CVRFs, especially diabetes, hypertension, dyslipidaemia, obesity, and other risk factors. It is important to identifying these CVRFs in

postmenopausal patients for an early treatment of these CVRF.

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