

Original Research Article

A study of clinical profile of cardiovascular manifestations in postmenopausal women

Bhavik Prajapati^{1*}, Shirish Raval¹, Jigar Patel¹, Ishwar Parmar², Janak Chokshi³, Nilay Thakore⁴

¹Assistant Professor, ²Senior Resident, ³Associate Professor, ⁴Professor and HOD
Department of Medicine, SMS Multispecialty Hospital, DR MK Shah Medical College, Chandkheda, Ahmedabad, Gujarat, India

*Corresponding author email: bhavikap87@yahoo.com

	International Archives of Integrated Medicine, Vol. 5, Issue 4, April, 2018. Copy right © 2018, IAIM, All Rights Reserved. Available online at http://iaimjournal.com/
	ISSN: 2394-0026 (P) ISSN: 2394-0034 (O) Received on: 04-04-2018 Accepted on: 09-04-2018 Source of support: Nil Conflict of interest: None declared.
How to cite this article: Bhavik Prajapati, Shirish Raval, Jigar Patel, Ishwar Parmar, Janak Chokshi, Nilay Thakore. A study of clinical profile of cardiovascular manifestations in postmenopausal women. IAIM, 2018; 5(4): 100-106.	

Abstract

Background: In today's era lifestyle related diseases like diabetes mellitus, have emerged as a major public health problem. Diabetes mellitus, a common metabolic disorder, which accounts for a high incidence of morbidity leads to various events including micro and macro vascular complications. This study aims to assess the baseline levels of (KAP) knowledge, attitude and practices of general population of Vadodara.

Materials and methods: The present cross sectional study was carried out on general population of Vadodara with the help of a suitably designed and validated KAP questionnaire. The questionnaire was pretested and verified for errors. The data was analyzed statistically.

Results: Altogether, 60.12 % of respondents scored 100% in the questions related with knowledge. However 23.54% scored 100% in the attitude questions and 12.80% scored 100% in practice questions.

Conclusions: We can conclude that the responders had good knowledge but poor attitude and practice towards diabetes. We can overcome this by increasing quality of health education and improving applicability of scope of health education at all level. The effect of the hormonal changes associated with menopause may play an important role in most cardiovascular disorders in post-menopausal women. So the present study was undertaken to identify various cardiovascular profile changes in postmenopausal women and women were recruited for the study. We check for various parameters like hypertension, diabetes, Ischemic heart disease, Cerebrovascular Stroke, metabolic syndrome, anaemia, fundus examination. Results: Prevalence of Hypertension, dyslipidaemia, metabolic

syndrome, CV stroke, ischemic heart disease is higher in postmenopausal women. Five deaths due to cardiovascular disease were observed. This study showed high prevalence of most of the conventional cardiovascular risk factors, especially diabetes, hypertension, dyslipidemia, obesity, and other risk factors in postmenopausal women. Therefore it is important to consider each and every postmenopausal woman to undergo screening for cardiovascular profile and very important to identify and treat these cardiovascular risk factors properly to prevent mortality and morbidity.

Key words

Post-menopausal women, Diabetes, Hypertension, Cardiovascular diseases, Metabolic syndrome, Dyslipidemia.

Introduction

Menopause is the permanent cessation of menstruation due to loss of ovarian follicular function [1]. It is diagnosed retrospectively after 12 months of amenorrhea [1, 2]. In India 7.4 % of women are in the age group of 60 years or more [3, 4]. This much of population in the postmenopausal age group in India [5]. During a woman's fertile years, coronary artery disease is rare, with a male-to-female ratio of at least 3:1, for age-matched individuals. After menopause, this ratio progressively decreases reaching 1:1, at the age of 75 and above [6]. A 50-year-old woman has a 50% chance of developing coronary artery disease, and a 30% chance of dying from it during the postmenopausal years [7, 8]. With the progressive increase in life expectancy, the number of women older than 50, and consequently in menopause, is much higher today than in previous decades. 13.6% and 9.2% of all deaths of the women are attributed to CAD and stroke respectively [9]. Cardiovascular disease risk (CVD) that increases after the menopause may be related to metabolic and hormonal changes [10, 11]. The present study was carried out to determine various cardiovascular Key risk factors that need to be controlled in the peri-menopausal women. So that appropriate prophylactic measures can be taken in time, which can prevent cardiovascular incidents and give healthier life.

Materials and methods

We included the Postmenopausal women who had given informed consent, without structural heart disease and any disease that could interfere

with investigation or therapy (e.g. malignancy or psychiatric disease) visited the Medical OPD and/or admitted in Medicine department, SMS Hospital, Dr MK Shah Medical College, Ahmedabad from December 2016 onward. A total of 50 consecutive postmenopausal women (cessation of menstruation for 1 year) were explained the purpose and procedure of the study, their written consent to participate in the study was taken. They were screened for detailed information regarding duration of menopause, common cardiovascular symptoms, the presence or absence of conventional cardiovascular risk factors, namely hypertension (HT), Type II diabetes mellitus (DM), dyslipidemia, obesity, metabolic syndrome, smoking, alcohol, tobacco chewing, and family history of cardiovascular disease; any treatment if taken for the cardiovascular disease (wherever applicable). Height, weight, body mass index (BMI), waist circumference, waist-hip ratio (WHR), blood pressure measurement were performed in all. Biochemical tests and hematological tests including Hemoglobin, fasting blood sugar (FBS), fasting lipid profile, and serum creatinine were performed in all. CPK MB and Troponin I were performed in selected patients who could afford and whenever applicable. Hypertension was diagnosed when systolic BP was ≥ 140 mmHg and/or diastolic BP was ≥ 90 mmHg or a person was a known hypertensive. Body mass index (BMI) was calculated as weight in kilograms divided by square of height in meters and overweight ≥ 23 kg/m² and obesity defined as BMI ≥ 25 kg/m² according to criteria define for Indian population

by ministry of health, All India Institute of Medical Science and Indian diabetic foundation [11]. Central obesity according to IDF (international diabetic foundation) when waist size ≥ 80 cm also included [12]. Central obesity was diagnosed when waist: hip ratio > 0.8 [11]. Dyslipidemia was defined by the presence of high TC (≥ 200 mg/dL), high LDL (≥ 130 mg/dL), low HDL (< 50 mg/dL), or high TG (≥ 150 mg/dL) according to NCEP: ATP III guidelines [13]. Metabolic syndrome was also diagnosed according to NCEP: ATP III guidelines when any three of the five identifying risk factors [central obesity (waist circumference > 88 cm), fasting glucose > 100 mg/dL or on treatment for diabetes, BP $\geq 130/90$ mmHg or on treatment for hypertension, low HDL < 50 mg/dL, or high TG ≥ 150 mg/dL] were present. Anaemia is defined according to WHO criteria [12]. Chest X-ray P/A view, USG KUB, Fundus, ECG and 2-D echocardiography were in all patients, while CT/MRI brain, 4 Vessel Doppler and TMT were done when ever applicable.

Results

The study was carried out on 50 postmenopausal women and showed following results. In our study, 5 deaths were observed. Causes of these deaths were CHF + VT, left thalamic and internal capsule ICH, right fronto parieto occipital infract, inferior wall STEMI and CHB, anterior wall STEMI. Study findings were depicted as per **Table – 1 to Table – 10**.

Table - 1: Distribution of patients according to age.

Age group (Years)	Percentage of patients (n=50)
49-58	26% (13)
59-68	36% (18)
69-78	26% (13)
79-88	12% (6)

Discussion

According to study 36% of patients were in age group of 59-68 years and followed by 26% of patients were in age group of 49-58 years and 69-78 years, both of this age group had same numbers of patients. Mean age of the patients with standard deviation was 65.2 ± 9.5 years.

Table - 2: Clinical diagnosis in postmenopausal women.

Clinical diagnosis	Percentage of patients			
	Total	Newly detected	Known cases	Positive family history
Hypertension	58% (n=50)	34.48% (n=29)	65.52% (n=29)	36%
Type II DM	36% (n=50)	33.33% (n=18)	66.67% (n=18)	14%
IHD	40% (n=50)	30% (n=20)	60% (n=20)	10%
CVA	22% (n=50)	54.55% (n=11)	36.36% (n=11)	10%

Table - 3: Distribution of obesity in postmenopausal women*

BMI		Percentage of patients (n=50)	Percentage of hypertensive patients (n=29)	Percentages of type II diabetic patients (n=18)
18.5-22.9kg/m ²	Healthy	16% (8)	13.79% (4)	5.56% (1)
23-24.99 kg/m ²	Overweight	12% (6)	17.24% (5)	5.56% (1)
25-29.99 kg/m ²	Grade-I Obese	44% (22)	51.72% (15)	44.45% (8)
30-34.99 kg/m ²	Grade-II Obese	16% (16)	10.34% (3)	22.22% (4)
≥ 35 kg/m ²	Grade-III Obese	12% (6)	6.8% (2)	22.22% (4)

*These obesity criteria had been define for Indian population in 2008 by joint effort from ministry of health, AIIMS (All India Institute of Medical Science) and Indian diabetic foundation.

Table - 4: Distribution of anemia in postmenopausal women.

WHO grading of anaemia (GM/DL)	Percentage of patients (n=50)
Normal	28% (14)
Grade-I (9.5-10.9)	52% (26)
Grade-II (8.0-9.4)	14% (7)
Grade-III (6.5-7.9)	4% (2)
Grade-IV (<6.5)	2% (1)

Table - 5: Assessment of lipid profile in postmenopausal women [13]

Lipid profile (mg/dl)	Percentage of patient	Percentage of type II diabetic patients (n=18)	Percentage of hypertensive patients (n=29)
LDL \geq 130	32% (16)	61.11% (11)	41.38% (12)
Cholesterol \geq 200	30% (15)	61.11% (11)	34.48% (10)
HDL < 50	30% (15)	50% (9)	34.48% (10)
TG \geq 150	32% (16)	66.67% (12)	51.72% (15)

Table - 6: Various 2-d echocardiographic finding in postmenopausal women.

2-D ECHO	Percentage of patients (n=50)
LVEF	
	\geq 50%
	<50%
	\leq 25%
LV size	
	Normal
	LVH
	Dilated
LV Systolic function	
	Normal
	Fair
	Poor
LV Diastolic Dysfunction	
	Grade I
	Grade II
	Grade III

Table - 7: Various abnormalities found on USG KUB.

USG KUB	Percentage of patients (n=50)
Normal	84% (42)
CMD lost	10% (5)
Raised cortical echogenicity	6% (3)

Table - 8: Various abnormalities detected in funduscopy.

Fundus	Percentage of patients
Normal	60% (n=50)
Only HTRP	24% (n=50)
	GRADE I
	GRADE II
	GRADE III
NPDR+HTRP	10% (n=50)
Only NPDR	6% (n=50)

Table - 9: Prevalence of metabolic syndrome.

Component of metabolic syndrome	Percentage of patients (n=50)
BP \geq 130/80 or on specific medication	64%(32)
Waist circumference $>$ 88 cm	60%(30)
FBS \geq 100mg/dl or specific medication	36%(18)
S. triglyceride \geq 150 mg/dl	32%(16)
S. HDL $<$ 50 mg/dl	30%(15)

Table - 10: Comparison of our study with other study.

Various cardiovascular parameters in postmenopausal women	Our study	Vishal Tondon, et al. [14]
Mean age of patients	65.2 \pm 9.5 Years	Not analysed
Mean duration of menopause	15.44 \pm 9.2Years	4.70Yrs
Hypertension	58%	56%
Type II DM	36%	21%
BMI $>$ 25 kg/m ²	72%	78%
Central obesity Waist/hip ratio $>$ 0.9	62%	68%
Waist circumference $>$ 88 cm	60%	60%
Dyslipidaemia		
LDL \geq 130 mg/dl	32%	27%
HDL $<$ 40 mg/dl	30%	21%
TG \geq 150 mg/dl	32%	31%
Cholesterol \geq 200 mg/dl	30%	30%
Metabolic syndrome	56%	53%
C- reactive positive	18/50	23/68
TMT	2/2	4/12
Smoker	30%	0.5%
Alcoholic	4%	0%
Tobacco chewer	20%	4%
On Antihypertensive drugs	32%	29%
Anti-diabetic therapy	12%	9%

Hypertension was found in 58% of patients with 36% patients were having positive family history for hypertension. Type II DM was found in 36% of patients with 14% of patients were having positive family history for Type II DM. So even if these all patients had their cardiovascular risk factors emergence in their postmenopausal period, family history should also be considered as additional risk factor, while evaluating the patients IHD was found in 40% of patients. CVA was found in 22% of patients. In our study 5 deaths were observed. Causes of these deaths were CHF + VT, left thalamic and internal capsule ICH, right fronto parieto occipital infarct, inferior wall STEMI and CHB, anterior wall STEMI.

We found in study, 72% post-menopausal women are obese. Hypertension and diabetes are more in these obese postmenopausal women. We had observed that either of BMI, NCEP: ATP III or IDF criteria when applied, obesity was more prevalent among Type II diabetic patients than hypertensive patients.

Majority of our study population had grade I anemia. Anemia should be one of the considerations as it can aggravate the IHD symptoms or lower CVD risk threshold.

We interpret the high serum triglyceride was found in high prevalence in total as well as hypertensive and Type II diabetic patients also.

Then in decreasing order alteration found in S.LDL, S. total cholesterol and then S. HDL.

Out of 50 patients echocardiography was found abnormal in the form of dilated LV and poor LV function in 30% of patients and 13 patients were having diastolic dysfunction 26%. LVH was found in 16% of patients. LVEF <50% was found in 30% of patients.

84% of patients had normal KUB ultrasound with 6% had AKI and 12 % had CKD. In this study, we had only HTRP in 12 out of 50 patients (24%). Only NPDR was found in 3 out of 50 patients (6%), while NPDR and HTRP both were found in 5 out of 50 patients (10%). 30 patients didn't have any abnormalities on fundoscopy (50%) [14, 15].

As we analyzed above data in detail and apply it in NCEP: ATP III criteria for metabolic syndrome, 56% of patients in our study were fulfilling the criteria.

Conclusion

In our study, mean age of patient was 65.2 ± 9.5 years with mean duration of menopause was 15.44 ± 9.2 years. We found hypertension was present in 58%, diabetes in 36%, IHD in 40% and CVA in 22% of patients. Obesity was present by BMI ≥ 25 kg/m² in 72%, by waist circumference of >88 cm in 60%, by waist: hip ratio > 0.8 in 76% of patients. High S. LDL ≥ 130 mg/dl in 32%, low S. HDL < 50 mg/dl in 30%, high S. Triglyceride in 32%, high S. total cholesterol in 30% of patients. Metabolic syndrome was present in 56% of patients. Five deaths due to cardiovascular disease were observed.

This study showed high prevalence of most of the conventional cardiovascular risk factors, especially diabetes, hypertension, dyslipidemia, obesity, and other risk factors in postmenopausal women. It is very important to identify and treat these cardiovascular risk factors properly to prevent mortality and morbidity.

References

1. JoAnn E. Manson. The menopausal transit and postmenopausal hormone therapy, Harrison's principles of internal medicine, 2012; 3040-45.
2. Henderson KD, et al. Predictors of Timing of Natural Menopause in the Multiethnic Cohort Study. *Am J Epidemiology*, 2008; 167: 1287-94.
3. www.censusindia.gov.in/vital_statistics/srs/chap_2_2010_1128.
4. Marchant DJ. Supplemental estrogen replacement. *Cancer*, 2004; 74: 512-7.
5. Roberto Bassan. Cardiovascular Changes and Cardiac Morbidity of Menopause. Effects of Hormone Replacement Therapy, *Arquivos Brasileiros de Cardiologia*, 2007; 72(1).
6. Kennel WB, Hjortland MC, McNamara PM, et al. Menopause and the risk of cardiovascular disease: the Framingham Study. *Ann Intern Med.*, 1996; 85: 447-55.
7. Grodstein F, Stampfer MJ. Epidemiologic studies on ERT and cardio protection: state of the art on HRT and cardiovascular disease. In: Crosignani PG, et al (Ed) - *Women's Health in Menopause: Behavior, Cancer, Cardiovascular Disease, Hormone Replacement Therapy*. Dordrecht: Kluwer Academic Publishers, 2004 p. 133-147.
8. Sismondi P, Biglia N, De Fabiani E, et al. Hormone replacement therapy and gynecologic cancers. In: Crosignani PG, et al. (Ed). *Women's health in menopause: behavior, cancer, cardiovascular disease, hormone replacement therapy*. Dordrecht: Kluwer Academic Publishers, 2004, p. 197-206.
9. Thomas A. Ganziano, *Epidemiology of cardiovascular disease*, Harrison's principles of internal medicine, 2012; p. 1811-17.
10. Zarate A, Saucedo R, Basest L, Martinez C. Cardiovascular disease as a current

- heart threat of the older women. Relation to estrogens. *Gynecol. Obstet. Mex*, 2007; 75: 286-92.
11. Rosa no GM, Vitale C, and Marazzi G, Volterrani M. Menopause and cardiovascular disease: the evidence, *Climacteric*, 10 Suppl., 2007; 1: 19-24.
 12. Shashank R. Joshi. Disorder of adipose tissue and obesity, *API textbook of medicine*, 2012; 2(9): 1275-1278.
 13. Robert H. Eckel. The metabolic syndrome, *Harrison's principles of internal medicine*, 2012; p. 1992-1998.
 14. SM Grundy, et al. National education program adult treatment panel III guidelines. *Circulation*, 2004; 110: 227.
 15. Vishal R. Tandon, Annil Mahajan, Sudhaa Sharma, Anil Sharma. Prevalence of cardiovascular risk factors in postmenopausal women: A rural study. *J Midlife Health*, 2010 Jan-Jun; 1(1): 26–29.