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ORIGINAL ARTICLE

Prevalence of Hypertension and Associated Risk Factors among Post-Menopausal Women of Boalkhali Upazila of Chattogram District: Cross Sectional Observational Study

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Abstract:

Background: Prevalence of hypertension increases with age and postmenopausal women remain at higher risk than other population group. Various risk factors attribute to the precipitation of the postmenopausal hypertension, however definitive mechanism have not been completely explicated till date. Aims of the study: The study attempted to evaluate the prevalence of hypertension and associated risk factors among postmenopausal women of Boalkhali Upazila, Chattogram, Bangladesh. Materials and method: This cross sectional study was conducted at Boalkhali Upazila of Chattogram District with total 400 post-menopausal women who have been included in this study with convenient sampling method. Results: The study results showed that, mean age of postmenopausal women was 58.65±7.67 years, 11.75% of them had pre-hypertension and 35.75% of them had hypertension. A logistic regression analysis showed that, age, marital status, menopausal onset, BMI, hip circumference, family history of comorbidities (hypertension, diabetes mellitus and both hypertension and diabetes mellitus), comorbidities of the respondents such as diabetes mellitus, ischemic heart disease and sedentary life style were independent risk factors of hypertensive status of the post-menopausal women when adjusted for other risk factors (p<0.05). Conclusion: This study conclude that, high prevalence of hypertension among post-menopausal women. So, its need to be more concern about post-menopausal women to reduce the prevalence of hypertension and risk factors to avoid hypertension related cardiovascular death and other dare complications.

Key words: Prevalence, Hypertension, Risk factors, Post-menopausal women.

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Introduction:

Hypertension is one of the leading cause of global burden of disease, posing a major public health challenge to population in socio-economic and epidemiological transition. This problem is of special concern for developing countries, where studies have projected an increase by 80% in the number of hypertensive patient by the year 2025.[1]

Unlike the epidemics of obesity and diabetes, the incidence of hypertension in women is gradually swelling.[2] Furthermore, cardiovascular diseases (CVD) in women are under-diagnosed and under-treated.[3] A common perception that prevails regarding women is that they are at a substantial lower risk of hypertension than men, which can tend to the poorer screening and treatment outcome for this disease among them.[4] Moreover, women are usually not accustomed to comprehensive management for high blood pressure and they suffer poor health outcomes compared with men in the long run.[5]

It is seen that blood pressure is typically lower in premenopausal women than in their male counterparts.

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However, after menopause, the prevalence of hypertension in women is higher than it is in men of same age group, which in turn leads to increased morbidity and mortality in postmenopausal women.[6] Currently, H"75% of postmenopausal women in the United States are hypertensive.[7] The particular risk factors that are unique for women need to be recognized since they will help to lessen the number of hypertension-related events, i.e. the extent of the problem, identifying high-risk factors among women.[4] There is lack of study in Bangladesh about the prevalence of hypertension among post-menopausal women. Hence, the objective of the current study was to examine the prevalence of hypertension and associated risk factors among post-menopausal women in Boalkhali Upazila of Chattogram District.

Materials and methods:

This Cross-sectional observational study was conducted in Boalkhali Upazila, Chattogram, Bangladesh. From the period of 1st September 2022 to 28th February 2023 among Post-menopausal women newly or previously diagnosed as hypertensive after menopause where data was collected by convenient sampling method after taking informed written consent with following Inclusion Criteria: Post-menopausal women. Exclusion criteria: (1) Post-menopausal women suffering from debilitating illness, and (2) Post-menopausal women with history of hysterectomy.

Data analysis: Statistical Package for Social Sciences (IBM SPSS, version 25.0) program was used for the statistical analysis of the data. Descriptive statistics, frequencies and the percentage were calculated to summarize data. Logistic regression and chi-square tests were conducted in order to identify the substantial associations between variables and the hypertensive risk factors. Following the 95 % confidence interval, the level of significance was fixed as $p<0.05$.

Results:

Age of the respondents

In this study, the age of the respondents ranged from 43 years to 80 years with the mean age of 58.65 ± 7.67 years. Among them 118 (29.5%) of the respondents aged below 50 years, 91 (22.75%) of the respondents aged between 51 to 60 years, 96 (24.0%) of them were aged between 61 to 70 years and 95 (23.47%) respondents aged between 70 to 80 years (Figure 1).

Menopausal onset of the respondents

The early onset of menopause (Before the age of 45 years) have been recorded in 16.00% of the respondents in this study. Late onset of menopause (After the age of 55 years) was evident in 5.50% of them. Onset of menopause in due time (45 -55 year of age) was recorded in 78.50% of the respondents (Table I).

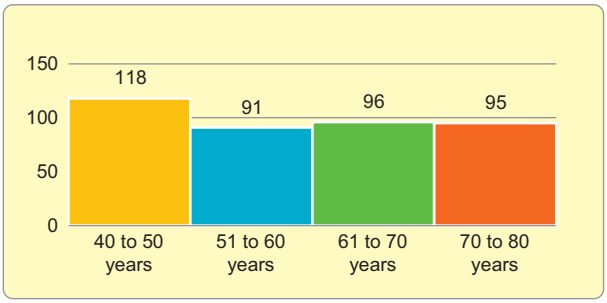

Figure 1: *Distribution of the respondents according to their age (n=400)*

Table-I

Time of onset of menopause of the respondents (n=400)

	Frequency	Percentage
Early onset	64	16.00
Late onset	22	5.50
Due time	314	78.50

Anthropometric measurements of the respondents

Mean of the height of the respondents were 144.00 ± 15.00 cm (range: 136.00-167.00 cm). Mean of the weight of the respondents were 58.31 ± 9.42 kg (range: 30.00-85.00 kg). Mean of the waist circumference of the respondents were 93.27 ± 7.90 cm (range: 72.00-115.00 cm). Mean of the arm circumference of the respondents were 25.77 ± 6.20 cm (range: 24.00-34.00 cm). Mean of the hip circumference of the respondents were 96.82 ± 7.78 cm (range: 76.00-120.00 cm) (Table II).

Table-II

Anthropometric measurements of the respondents (n=400)

	Range	Mean	SD
Height (cm)	136.00-167.00	144.00	15.00
Weight (kg)	30.00-85.00	58.31	9.42
Waist circumference (cm)	72.00-115.00	93.27	7.90
Arm circumference (cm)	24.00-34.00	27.77	2.20
Hip circumference (cm)	76.00-120.00	96.82	7.78

BMI of the respondents

BMI of the respondents revealed that, the underweight respondents were 4 (1.0%), Normal weight respondents were 168 (42.0%), overweight respondents were 161 (40.25%) and obese respondents were 67 (16.75%) in this study (Figure 2).

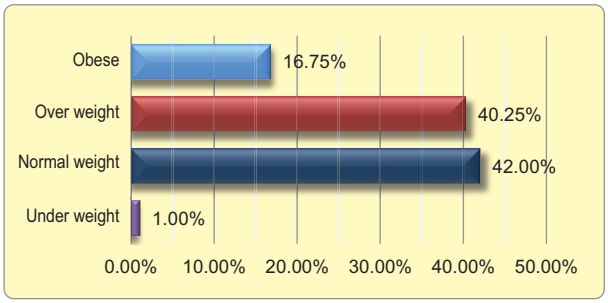

Figure 2: *Distribution of the respondents according to their BMI status (n=400)*

Blood pressure of the respondents

On physical examination, the systolic blood pressure ranges from 90.00-200.00 mmHg with the mean of 137.98 ± 23.22 mmHg and the diastolic pressure ranged from 60.00-120.00 mmHg with the mean of 81.27 ± 11.61 mmHg. The physical examination portrayed that, among the respondents, 52.50% respondents were normotensive, 11.75% respondents were pre-hypertensive and 35.75% respondents were hypertensive (Table III).

Table-III

Blood pressure measurements of the respondents during physical examination (n=400)

	Range	Mean	SD
Systolic BP (mmHg)	90.00-200.00	137.98	23.22
Diastolic BP (mmHg)	60.00-120.00	81.27	11.61
Hypertensive status	Frequency	Percentage	
Normotensive	210	52.50	
Pre-hypertensive	47	11.75	
Hypertensive	143	35.75	

Family history of comorbidities

Among the respondents, diabetes mellitus was the most commonly stated commodity in their family members which was reported by 87 respondents (21.75%). Family history of hypertension, diabetes and hypertension, stroke, CVD and dyslipidemia were reported by 27 (6.75%), 32 (8.00%), 12 (3.0%), 4 (1.0%) and 4 (1.0%) respondents respectively (Figure 3).

Comorbidities of the respondents

Among the respondents, 253 (63.25%) of them were suffering from diabetes mellitus, 71 (17.75%) of the respondents were suffering from ischemic heart disease (IHD), 100 (25.0%) of the respondents were suffering from dyslipidemia and thyroid disorders were recorded in 12 (3.0%) of the respondents (Table IV).

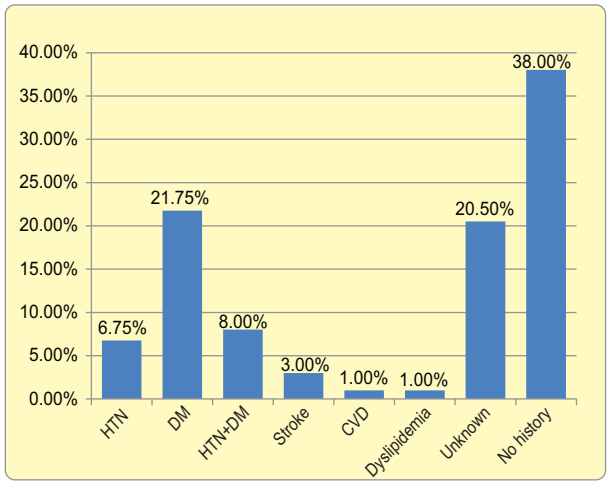

Figure 3: *Family history of comorbidities (n=400)*

Table-IV

Comorbidities of the respondents (n=400)

	Frequency	Percentage
DM	253	63.25
IHD	71	17.75
Dyslipidemia	100	25.00
Thyroid disorders	12	3.00

Other risk factors of hypertension among the respondents

Among the other risk factors of hypertension, tobacco consumption was reported by 102 (25.5%) of the respondents, history of contraceptive was noted in 48 (12.0%) of the respondents, no physical exercise was recorded 328 (82.0%) of the respondents and history of NSAIDs consumption was recorded in 36 (9.0%) of the respondents (Table V).

Table-V

Other risk factors of hypertension among the respondents (n=400)

	Frequency	Percentage
Tobacco consumption	102	25.5
H/O contraceptive use	48	12.0
Not doing physical exercise	328	82.0
NSAIDs consumption	36	9.0

Association between hypertension among respondents after menopause and their socio-demographic factors

Among the socio-demographic parameters, educational status and the marital status found to be statistically significantly associated with the hypertensive status of the respondents ($p<0.05$). Here, it has been observed that, with the increase of the educational acquirement the prevalence of hypertension among the respondents tend to get lower. And married respondents were less prevalent with hypertension than the unmarried, widowed or separated respondents (Table VI).

Table-VI

Association between hypertension among respondents after menopause and their socio-demographic factors (n=400)

Factors		Normotensive (n_1=210)		Pre-hypertensive (n_2=47)		Hypertensive (n_3=143)		p value
		Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	
Age	Below 50 years	88	41.90	7	14.89	23	16.08	0.256
	51 to 60 years	47	22.38	9	19.15	35	24.48	
	61 to 70 years	45	21.43	12	25.53	39	27.27	
	70 to 80 years	30	14.29	19	40.43	46	32.17	
Religion	Islam	198	94.29	30	63.83	139	97.20	0.052
	Hindu	8	3.81	16	34.04	4	2.80	
	Buddhist	4	1.90	1	2.13	0	0.0	
Occupational status	Physicians	3	1.42	1	2.13	3	2.10	0.051
	Health worker	6	2.86	3	6.38	4	2.80	
	Housewife	201	95.71	43	91.49	136	95.10	
Educational status	Illiterate	145	69.05	38	80.85	85	59.44	0.003
	Primary	43	20.48	4	8.51	41	28.67	
	SSC	14	6.67	3	6.38	13	9.09	
	Grad	5	2.38	2	4.26	3	2.10	
	Post grad	3	1.43	0	0.00	1	0.70	
Marital status	Married	123	58.57	21	44.68	62	43.36	0.011
	Widowed	81	38.57	22	46.81	79	55.24	
	Never married	2	00.95	4	08.51	2	01.40	
	Separated	0	00.00	2	04.25	2	01.40	

(The p value have been reached from chi-square analysis after adjusting with Fisher's exact test)

Association between hypertension among respondents after menopause and factors related to menopausal history

The early onset of menopause hold significantly higher prevalence of hypertensive respondents than the late onset or onset at due time group ($p<0.05$). However, the duration of menopause were not significantly associated with the hypertensive status of the respondents ($p>0.05$) (Table VII).

Association between hypertension among respondents after menopause and their anthropometric factors

It has been observed that, the mean of the weight and body circumferences (arm, waist and hip) were higher in the hypertensive patients than the non-hypertensive patients in this study. In cases of body circumferences (arm, waist and hip) the differences in means between the hypertensive and non-hypertensive groups were statistically significant ($p<0.05$) (Table VIII).

Association between hypertension among respondents after menopause and their BMI status

The evaluation of the BMI status of the respondents showed that, among the underweight respondents none

Table-VII

Association between hypertension among respondents after menopause and factors related to menopausal history (n=400)

Factors		Normotensive (n_1=210)		Pre-hypertensive (n_2=47)		Hypertensive (n_3=143)		p value
		Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	
Menopausal onset	Early	19	9.05	11	23.40	34	23.78	0.019
	Late	14	6.67	5	10.64	3	2.10	
	Due time	177	84.29	31	65.96	106	74.13	
Duration of menopausal period	10 years or less	34	16.19	22	46.81	55	38.46	0.076
	More than 10 years	176	83.81	25	53.19	88	61.54	

(The p value have been reached from chi-square analysis after adjusting with Fisher's exact test)

were hypertensive. Whereas, overweight and obese respondents were significantly higher hypertensive compared to that of the non-hypertensive respondents ($p<0.05$) (Table IX).

Association between hypertension among respondents after menopause and their family history of comorbidities

Family history of hypertension, diabetes mellitus, both hypertension and diabetes mellitus were in significant relation with the hypertensive status of the respondents ($p<0.05$) (Table X).

Association between hypertension among respondents after menopause and their existing comorbidities

Among the existing comorbidities, diabetes mellitus, dyslipidemia and ischemic heart disease were significantly associated with the hypertensive status of the respondents ($p<0.05$) (Table XI).

Association between hypertension among respondents after menopause and exposure history to other risk factors

Evaluation of other risk factors such as, tobacco consumption, contraceptive use, lifestyle factors and NSAIDs consumption was done. It has been observed that, tobacco consumption, H/O contraceptive use, not doing physical exercise, NSAIDs consumption were associated with the hypertensive status among the respondents ($p<0.05$) (Table XII).

Binary logistic regression analysis to identify independent risk factors to predict odds of hypertension among menopausal women

According to binary logistic regression analysis, the marital status, onset of menopause, family history of hypertension, family history of diabetes mellitus, family history of both hypertension and diabetes mellitus, hip circumference, BMI, history of ischemic heart disease and not doing physical exercise were independently associated with the hypertensive status of the respondents when adjusted for other factors ($p<0.05$). (Table XIII)

Table-VIII

Association between hypertension among respondents after menopause and their anthropometric factors (n=400)

Factors	Normotensive (n_1=210)		Pre-hypertensive (n_2=47)		Hypertensive (n_3=143)		p value
	Mean	SD	Mean	SD	Mean	SD	
Height (cm)	151.99	18.59	152.77	12.98	151.03	18. 34	0.253
Weight (Kg)	54.36	9.55	56.36	9.34	58.8	3.65	0.504
Arm circumference (cm)	23.68	2.64	24.77	7.33	26.28	7.26	0.008
Waist circumference (cm)	91.56	7.23	91.56	8.11	94.15	9.03	0.048
Hip circumference (cm)	93.36	4.20	95.6	7.97	97.56	8.11	0.039

(The p value have been reached from student's t test)

Table-IX

Association between hypertension among respondents after menopause and their BMI status (n=400)

Factors	Normotensive (n_1=210)		Pre-hypertensive (n_2=47)		Hypertensive (n_3=143)		p value
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	
Normal weight	145	69.05	11	23.40	12	8.39	0.000
Underweight	3	1.42	1	2.13	00	00.00	
Overweight	59	28.10	18	38.30	84	58.74	
Obese	3	1.42	17	36.17	47	32.87	

(The p value have been reached from chi-square analysis after adjusting with Fisher's exact test

Table-X

Association between hypertension among respondents after menopause and their family history of comorbidities (n=400)

Factors		Normotensive (n_1=210)		Pre-hypertensive (n_2=47)		Hypertensive (n_3=143)		p value
		Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	
Hypertension	Yes	03	1.42	06	12.77	18	12.59	0.041
	No	207	98.57	41	87.23	125	78.41	
DM	Yes	24	11.43	15	31.91	48	33.57	0.039
	No	186	88.57	32	68.09	95	66.43	
Hypertension & DM	Yes	04	1.90	8	17.02	18	12.58	0.000
	No	206	98.10	39	82.98	125	87.41	
Dyslipidemia	Yes	0	0.00	1	2.12	3	2.10	0.062
	No	210	100.0	46	97.87	140	97.90	
Stroke	Yes	1	0.48	1	2.12	2	1.39	0.076
	No	209	99.52	46	97.87	141	98.60	
No known comorbidities	Yes	144	68.57	34	72.34	56	39.16	0.789
	No	66	31.43	13	27.70	87	60.84	

(The p value have been reached from chi-square analysis after adjusting with Fisher's exact test)

Table-XI

Association between hypertension among respondents after menopause and their existing comorbidities (n=400)

Factors		Normotensive (n_1=210)		Pre-hypertensive (n_2=47)		Hypertensive (n_3=143)		p value
		Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	
DM	Yes	111	52.85	30	63.83	112	78.32	0.041
	No	99	47.14	17	36.17	31	21.67	
Dyslipidemia	Yes	19	9.04	33	70.21	48	33.57	0.039
	No	191	90.95	14	29.79	95	66.43	
IHD	Yes	15	7.14	8	17.02	48	33.57	0.000
	No	195	92.86	39	82.98	95	66.43	
Thyroid disorder	Yes	1	0.57	3	6.38	8	5.59	0.062
	No	209	99.52	44	93.72	135	94.41	

(The p value have been reached from chi-square analysis after adjusting with Fisher's exact test)

Table-XII

Association between hypertension among respondents after menopause and other risk factors (N=400)

Factors		Normotensive (n_1=210)		Pre-hypertensive (n_2=47)		Hypertensive (n_3=143)		p value
		Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	
Tobacco consumption	Yes	20	09.52%	17	36.17%	65	45.45%	0.037
	No	190	90.48%	30	63.83%	78	54.55%	
H/O contraceptive use	Yes	08	03.81%	12	25.53%	28	19.58%	0.021
	No	202	96.19%	35	74.47%	115	80.42%	
Regular physical exercise	Yes	39	18.57%	8	17.02%	25	17.48%	0.001
	No	171	81.43%	39	82.98%	118	82.52%	
NSAIDs consumption	Yes	4	1.90%	06	12.77%	26	18.18%	0.049
	No	206	98.10%	41	87.23%	117	81.82%	

(The p value have been reached from chi-square analysis

Table-XIII

Binary logistic regression analysis to identify independent risk factors to predict odds of hypertension among menopausal women

	Exp (B)	95% C.I. for EXP(B)		p value
		Lower	Upper	
Age	0.966	0.565	1.650	0.045
Marital status	2.573	1.443	4.586	0.001
Onset of menopause	1.372	0.996	1.891	0.043
Family H/O HTN	0.585	0.209	1.638	0.008
Family H/O DM	2.813	1.452	5.448	0.002
Family H/O HTN & DM	0.165	0.050	0.542	0.003
Waist circumference	1.057	0.917	1.220	0.443
Arm circumference	1.066	1.018	1.117	0.416
Hip circumference	0.938	0.804	1.094	0.006
BMI	1.588	1.291	1.954	0.000
DM	0.778	0.448	1.352	0.033
IHD	0.218	0.101	0.470	0.000
Tobacco consumption	1.432	0.765	2.681	0.262
Not doing physical exercise	7.915	3.868	16.195	0.000

Discussion:

The present study evaluated 400 women in their post-menopausal period for their hypertensive status and checked for the associated risk factors among them. The respondents aged between 43 to 80 years with the mean age of 58.65 ± 7.67 years among whom, more than half of the respondents aged between 51 to 80 years, nearly half of them were illiterate (67%), half of them were married (51.5%) and maximum of the respondents were housewives (95.0%). In this study, 35.75% respondents have been detected with hypertension. Several studies have worked in this field. With comparable socio-demographic background, a study in India observed hypertension among 416 post-menopausal women and found that, nearly 40.0% of them were hypertensive.[8] In another Indian study in an urban setting, this prevalence found to be 33.0% in 100 postmenopausal women. However, the prevalence of hypertension among Bangladeshi post-menopausal women found to be 21.3% among 380 women in the study of Boitchia,[9] and it was 49.2% among 1382 post-menopausal women in the study of Rahman et al.[10] In the present study the prevalence of hypertension was similar to these study.

Among the respondents of this study, onset of menopause in due time was recorded in 78.50% of the respondents. The menopausal onset was early in 16.00% cases. Late onset of menopause was evident in 5.50% of them. In this study, the menopausal duration of the respondents was 5 to 10 years (15.75%) and 11 to 15 years (38.50%). Menopausal onset found to significantly associated with the hypertensive status of the respondents where the group with early onset of menopause holds significantly higher proportion of hypertensive respondents than the late onset or onset at due time group ($p<0.05$). Although the duration of menopause were not significantly associated with the hypertensive status of the respondents ($p>0.05$). Women with early menopausal onset found to be at increased risk of chronic morbidities in their later life.[11] Increased risk of conditions like, neurological deficits and mental disorders, glaucoma, cardiovascular disease, osteoporosis are common in this group.[12] According to previous research work, both earlier onset of menopause and a longer duration of the postmenopausal period found to be precipitator of higher blood pressure among women.[13] Several population based studies and literature reviews are also suggestive of the link between early menopause and hypertension.[14]

BMI of the respondents revealed that, the underweight respondents were 1.0%, healthy weight respondents were 42.0%, overweight respondents were 40.25% and obese respondents were 16.75% in this study. The overweight and obese respondents hold higher proportion of hypertensive respondents than underweight or normal weight group ($p<0.05$). Also, the mean of the weight and body circumferences (arm, waist and hip) were higher in the hypertensive patients than the non-hypertensive patients in this study. In cases of body circumferences (arm, waist and hip) the differences in means between the hypertensive and non-hypertensive groups found to be statistically significant ($p<0.05$).

In the study of Bagdey et al., they found BMI more than 23 kg/m^2 was evident among 16% of the postmenopausal women and was significantly associated with the hypertensive status of the women.[15] In an another study, obesity found to be significantly associated with post-menopausal hypertension (Gupta et al., 2014).[16] Studies in Bangladesh also found BMI to have contributory role in the hypertension among women undergone menopause.[9,10] Rahman et al. also found waist circumference to be associated with this phenomenon.[10]

Among the respondents 63.25% of them were suffering from diabetes mellitus, 17.75% of the respondents were suffering from ischemic heart disease (IHD), 25.00% of the respondents were suffering from dyslipidemia and thyroid disorders were recorded in 3.0% of the respondents. In this sample, diabetes mellitus, dyslipidemia and ischemic heart disease were significantly associated with the hypertensive status of the respondents ($p<0.05$). Presence of metabolic syndromes such as body to resistance insulin, hyperglycemia, and dyslipidemia showed to have contributory role in hypertension onset in post-menopausal women.[17] Also in other research, diabetes and cardiovascular diseases found to be higher among the hypertensive post-menopausal women.[18]

Evaluation of family history of comorbidities showed that, diabetes mellitus was the most commonly stated comorbidity in their family members (21.75%). Family history of hypertension, diabetes and hypertension, stroke, CVD and dyslipidemia were reported by 6.75%, 8.00%, 3.0%, 1.0% and 1.0% respectively. Among these, family history of hypertension, diabetes mellitus, both hypertension and diabetes mellitus were in significant relation with the hypertensive status of the respondents ($p<0.05$). Positive family history of chronic non-communicable diseases are common non-modifiable risk factor for those disease incidences among the successors, due to genetic susceptibility as well as shared environments, practices and behaviors[19] Family history of hypertension is a established predictor of hypertension among the successors. Hypertension risk nearly doubles with one parent with hypertension, and this risk increases four folds with both parents have hypertension.[20] Positive family history of hypertension found to be contributory to the hypertension incidence in postmenopausal women in the studies of Gupta et al. and Bagdey et al.[15,16.]

Evaluation of other risk factors such as, tobacco consumption, contraceptive use, lifestyle factors and NSAIDs consumption was done. Among these risk factors of hypertension, tobacco consumption was reported by 25.5% of the respondents, history of contraceptive was noted in 12% of the respondents, don't do physical exercise evident among 82.00% of the respondents and consumption of NSAIDs was recorded in 9.00% of the respondents. It has been observed that, tobacco consumption, H/O contraceptive use, not doing regular physical exercise and NSAIDs consumption were associated with the hypertensive status among the respondents ($p<0.05$). Low physical activity is an important determinant of hypertension[21] and other studies also found low physical exercise to have imperative role in hypertension in postmenopausal women.[8,9,16]

A logistic regression showed that, age, marital status, menopausal onset, BMI, hip circumference, family history of comorbidities (hypertension, diabetes mellitus and both hypertension and diabetes mellitus), comorbidities of the respondents (diabetes mellitus, ischemic heart disease and not doing regular physical exercise were independent risk factors of hypertensive status of the post-menopausal women when adjusted for other risk factors ($p<0.05$). As discussed above these factors are important contributors of raised blood pressure and increased cardiovascular risks, and post-menopausal women are at heightened risk. Similar presentation have been observed in the study of Boitchia et al., found that, increased age, being overweight and obese, lower physical activity, family history of hypertension were independent risk factors of hypertension among postmenopausal women.[9]

Conclusion:

This study findings reveals that there was high prevalence of hypertension among post-menopausal women and it was observed that, age, marital status, menopausal onset, BMI, hip circumference, family history of comorbidities (hypertension, diabetes mellitus and both hypertension and diabetes mellitus), comorbidities of the respondents such as diabetes mellitus, ischemic heart disease and not doing regular physical exercise were important predictors of the hypertensive status of the respondents in this sample.

Recommendation:

Further study is recommended with multicenter approach including different social strata, may provide advanced depiction of the risk factors of hypertension among post-menopausal women. This will be beneficial to conduct public health plans and strategies to identify at risk women and implement necessary actions to prevent the incidence of hypertension among them and thus prevent cardiovascular morbidities in this set of population.

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Conflict of Interest:
The author has no conflict of interest.

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