

Research Article**The Role of Gender and Their Marital Status in the Prevalence of Hypertension in Kashmiri Population**¹Dr. Shabir Dangroo, ²Dr. Sajad Hamid, ³Dr. M. Rafiq, ⁴Dr. Ashfaq¹Department of community medicine, SKIMS Medical College, Bemina, Srinagar, Jammu and Kashmir²Lecturer, SKIMS Medical college, Bemina, Srinagar, Jammu and Kashmir³Assistant Professor, Community medicine, SKIMS Medical College, Bemina, Srinagar, Jammu and Kashmir⁴Assistant Professor, Community medicine, SKIMS Medical College, Bemina, Srinagar, Jammu and Kashmir***Corresponding author**

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Abstract: A community based cross-sectional descriptive study was carried out to assess the prevalence of hypertension with respect to sex and marital status. The study was taken from Oct. 2012 to Sept. 2013. District Pulwama was undertaken for the study, approximately 56% of this population comprise 18 years and above. The sampling method used was 10% villages from each block were taken for study using population proportion to size method (PPS). From each selected village 5% households were taken by systemic random method for the study. We have taken a sample size of 2100, out of which 1007 participants were males and 1093 participants were females. In each household, inmates of age 18 years and above were screened for hypertension. Those found fulfilling the inclusion criteria laid down for hypertension (JNC-VII 2003) were subjected to pretested questionnaire and two blood pressure readings were taken. The study population with hypertension and pre-hypertension (407 participants out of which 101 are pre-hypertensive) was screened for sex and marital status and two blood pressure readings 10 minutes apart mercury sphygmomanometer which was standardised. Both blood pressure measurements were taken after the subject was resting for at least 5 minutes in a sitting position. Blood pressure measurements were obtained on the right arm using a cuff of appropriate size and with instrument at the level of the heart. The cuff pressure was inflated 30mmHg above the level at which the radial pulse disappears, then deflated slowly at the rate of 2 mmHg per second and the readings recorded to the nearest 2 mmHg. The first and the fifth Korotk off sounds were taken as indicative of the systolic and diastolic blood pressure respectively. The average of the two readings of systolic and diastolic blood pressure was used as the blood pressure of the participant. In results; Males 1007 (48%), Females 1093 (52%), Overall prevalence of hypertension 306 (14.56%), Prevalence in males 139 (13.8%) Prevalence in females 167 (15.3%) Prevalence in married males 104 (12.27%), Prevalence in widowed males 25 (32%) Prevalence in married females 127 (14.71%) Prevalence in widowed females 30 (30.89%) Mean age males 64 ± 2.36 years range 23 to 85 Mean age females 53 ± 2.34 years range 18 to 80. In conclusion, The overall prevalence was 14.56%, 13.8% in males and 15.3% in females. 4.84%, 8.5% and 6.8% females were in pre-hypertension, stage-I and stage-II hypertension respectively. Among males 4.76% in pre-hypertension, 6.5% in stage-I and 7.3% were with hypertension. The distribution of hypertension, among pre-hypertensive, 52.47% were females and 47.52% were males. Among hypertensive subjects, 54.47% were females and 45.42% were males. Widowed study subjects had higher tendency to have hypertension 32% in males and 30.89% in females. So it is clear that males are more prone to have high blood pressure. Also, it is seen from the study that a happy marriage is good for our blood pressure.

Keywords: District Pulwama, hypertension, Prevalence**INTRODUCTION**

Almost 1 billion people worldwide have high blood pressure, and over half a billion more will have this silent killer by 2025. The dangers go well beyond the heart, High blood pressure is a leading cause of strokes and kidney failure. It also plays a role in blindness and even dementia. It has been estimated that hypertension accounts for 6% of deaths worldwide [1].

Cardiovascular diseases caused 2.3 million deaths in India in the year 1990; this is projected to double by the year 2020 [2]. Hypertension is directly responsible for 57% of all stroke deaths and 24% of all coronary heart disease deaths in India. There is a strong

correlation between changing lifestyle factors and increase in hypertension in India. The Nature of genetic contribution and gene environment interaction in accelerating the hypertension epidemic in India needs more studies.

Pooling of epidemiological studies shows that hypertension is present in 25% urban and 10% rural subjects in India. At an underestimate, there are 31.5 million hypertensives in rural and 34 million in urban populations. A total of 70% of these would be Stage I hypertension (systolic BP 140-159 and/or diastolic BP 90-99 mmHg). Recent reports show that borderline hypertension (systolic BP 130-139 and/or diastolic BP

85-89 mmHg) and Stage I hypertension carry a significant cardiovascular risk and there is a need to reduce this blood pressure [3]. Control of the cardiovascular diseases will require modification of risk factors that have two characteristics.

First, the risk factor must have high attributable risk or high prevalence or both, and secondly, most or all of the risks must be reversible cost-effectively. Blood pressure is directly associated with risks of several types of cardiovascular diseases, and the associations of BP with disease risk are continuous with large proportions of most populations having non-optimal blood pressure values. Moreover, most or all BP-related risks appear to be reversible within a few years with inexpensive interventions. In India cardiovascular diseases cause 1.5 million deaths annually. Hypertension is directly responsible for 57% of all stroke deaths and 24% of all coronary heart disease deaths. This fact is important because hypertension is a controllable disease and a 2 mm Hg population wide decrease in BP can prevent 151,000 stroke and 153,000 coronary heart disease deaths. This article summarizes the role of sex and marital status in the prevalence of hypertension in Kashmiri population [4].

Studies have shown an increasing trend in the prevalence of hypertension. Community surveys have documented that in a period of three to six decades, prevalence of hypertension has increased by about 30 times among urban dwellers and by about 10 times among the rural inhabitants. Prevalence of hypertension is 20% worldwide, 27-30% in India. Average systolic blood pressure is higher for men than for women during early adulthood, although among older individuals the age-related rate of rise is steeper for women. Consequently, among individuals age 60 and older, systolic blood pressures of women are higher than those of men. Among adults, diastolic blood pressure also increases progressively with age until 55 years, after which it tends to decrease. The consequence is a widening of pulse pressure (the difference between systolic and diastolic blood pressure) beyond age 60.

Kashmir is not far behind because of recent turmoil, increase in stress, which increased the prevalence of hypertension. The earlier studies from the Valley, showing the prevalence of hypertension may not hold true now, as such this study was undertaken, more so to look for any newer risk factors other than already taken. It was also seen, that rule of halves, doesn't hold true in presence of modern health facilities and literacy. Prevalence of hypertension with respect to sex and marital status in Kashmiri population was assessed in District Pulwama. The District headquarter is 32 kms from Srinagar

METHODOLOGY

A community based cross-sectional descriptive study was carried out to assess the prevalence of hypertension with respect to sex and marital status. The study was taken from Oct. 2012 to Sept. 2013.

Selection of population

District Pulwama was undertaken for the study, the total population of District Pulwama is 4,57,883, approximately 56% of this population comprise 18 years and above population which is 2,56,414. There are three medical blocks namely Tahab, Traal and Pampore. The total number of villages in District Pulwama is 319 [5].

Sampling method

The sampling method used was multistage, list of all villages of each block was obtained from respective block headquarters (BMO's office) with population of each village and a cumulative population list was calculated for each Block. 10% villages from each block were taken for study using population proportion to size method (PPS). From each selected village 5% households were taken by systemic random method for the study. Minimum sample required was calculated using formula, $n = Z^2 \times P(1-P)/d^2$, where, $Z = 1.96$ (with 95% confidence interval), $P = 13\%$ (prevalence), d is (precision) $\pm 5\% = 5\%$ (0.05), which makes 774 participants. We have taken a sample size of 2100, out of which 1007 participants were males and 1093 participants were females. In each household, inmates of age 18 years and above were screened for hypertension. Those found fulfilling the inclusion criteria laid down for hypertension (JNC-VII 2003) were subjected to pretested questionnaire and two blood pressure readings were taken. Study population (2100 participants) comprised both males (1007 participants) and females (1093 participants) of age 18 years and above. The study population with hypertension and pre-hypertension (407 participants out of which 101 are pre-hypertensive) was screened for sex and marital status and two blood pressure readings 10 minutes apart by mercury sphygmomanometer which was standardized. Both blood pressure measurements were taken after the subject was resting for at least 5 minutes in a sitting position. Blood pressure measurements were obtained on the right arm using a cuff of appropriate size and with instrument at the level of the heart. The cuff pressure was inflated 30mmHg above the level at which the radial pulse disappears, then deflated slowly at the rate of 2 mmHg per second and the readings recorded to the nearest 2 mmHg. The first and the fifth Korotkoff sounds were taken as indicative of the systolic and diastolic blood pressure respectively. The average of the two readings of systolic and diastolic blood pressure was used as the blood pressure of the participant.

Definition: Blood pressure is pressure exerted on the vessel wall, **normal** systolic < 120mmHg and diastolic < 80mmHg.

Pre-hypertension 120-139 mmHg systolic and 80-89mmHg diastolic.

Stage-I Hypertension 140-159 mmHg systolic and 90-99mmHg diastolic.

Stage-II hypertension systolic \geq 160 mmHg and diastolic \geq 100 mmHg [6] .

JNC-VII classification	Systolic blood pressure	Diastolic blood pressure
Normal	\leq 120 mmHg	\leq 80 mmHg
Pre-hypertension	120-139 mmHg	80-89 mmHg
Stage-1	140-159mmHg	90-99mmHg
Stage-2	\geq 160mmHg	\geq 100mmHg

RESULTS AND OBSERVATIONS

Population Characteristics Of The Study

Population characteristics (%)	
Total population screened	2100 participants
Males	1007 (48%)
Females	1093 (52%)
Overall prevalence of hypertension	306 (14.56%)
Prevalence in males	139 (13.8%)
Prevalence in females	167 (15.3%)
Prevalence in married males	104 (12.27%)
Prevalence in widowed males	25 (32%)
Prevalence in married females	127 (14.71%)
Prevalence in widowed females	30 (30.89%)
Mean age males	64 \pm 2.36 years range 23 to 85
Mean age females	53 \pm 2.34 years range 18 to 80

Table-1:Distribution of hypertension (stage-I+stage-II), as per JNC-7, in the sample screened (2100 participants), males (1007 participants) and females (1093 participants)

SEX	n	JNC-7 Classification				(Stage-I + Stage-II) Hypertension
		Normal BP	Pre-Hyper-tension	Stage-I	Stage-II	
Female	1093	873(79.87)	53(4.84)	93(8.5)	74(6.8)	167 (15.3)
Male	1007	820(81.42)	48(4.76)	65(6.5)	74(7.3)	139(13.8)
Total	2100	1693(80.61)	101(4.80)	158(7.52)	148(7.04)	306(14.56)

$\chi^2=3.352$, $df=3$, $sig=0.340$

The total population screened in District Pulwama (2100), 1007 males and 1093 females. The males(1007), 820(81.42%) were with normal blood pressure, 48(4.76%) pre-hypertensive and 139(13.8%) with hypertension. In females (1093), 873(79.87%) were with normal blood pressure , 53(4.84%) pre-

hypertensive and 167(15.3%) with hypertension. The overall prevalence of hypertension was 14.56%, 13.8% in males and 15.3% in females. Stage-1 hypertension was observed more in females (8.5%) than males(6.5%), while as stage-II hypertension was more in males (7.3%) as compared to females (6.5%).

Table- 2: Distribution of hypertension among sample population who fulfilled the criteria(JNC-VII), (407) , as per their gender.

SEX	TOTAL	JNC-7 CLASSIFICATION			(Stage-I+stage-II)
		pre-hypertension	stage-I	stage-II	Hypertension
Female	220(54.05)	53(52.47)	93(58.88)	74(50)	167(54.47)
Male	187(45.94)	48(47.52)	65(41.13)	74(50)	139(45.42)
Total	407(100)	101 (100)	158(100)	148(100)	306(100)

$\chi^2=2.551$, $df=$, $sig= 0.279$

The distribution of pre-hypertension among sample population who fulfilled the criteria of JNC-VII was 53(52.47%) in females and 48(47.52%) males. Likewise hypertension 167(54.47%) in females and 139(45.42%) in males. The distribution of stage-I

hypertension was more among females (58.88%) as compared to males (50%), while the distribution of stage-II hypertension was more in males (50%) as compared to females (41.13%).

Table-3: Prevalence of blood pressure as per marital status.

Sex	marital status	N	JNC-7 Classification				(Stage-I+stage-II)
			Normotensive	Pre-Hypertension	Stage-I	Stage-II	HTN
Male	Married	847	728 (85.97)	15(1.77)	50 (5.9)	54 (6.37)	104(12.27)
	Un-married	82	56(68.29)	16(19.51)	6(7.31)	4(4.87)	10(12.19)
	Widowed	78	36 (46.15)	17(21.79)	15(19.23)	10(12.82)	25(32.0)
	Total	1007	820	48	71	68	139
Females	Married	863	708 (82.03)	28(3.24)	76(8.80)	51(5.90)	127(14.71)
	Un-married	107	90(84.11)	15(14.01)	02(1.86)	0	02(1.68)
	Widowed	123	75(60.97)	10(8.13)	15(12.19)	23(18.67)	38(30.89)
	Total	1093	873	53	93	74	167

$\chi^2=139.443$, $df=6$, $sig= 0.000$ (males); $\chi^2=73.752$, $df=6$, $sig=0.000$ (females)

Out of 847 married males, 728(85.97%) were with normal blood pressure, 15(1.77%) pre-hypertension and 104(12.27%) with hypertension. The hypertensives are more in stage-II (6.37%) as compared to stag-I (5.9%). Out of 82 un-married males, 56(88.29%) were with normal blood pressure, 16(19.51%) pre-hypertensive and 10(12.19%) in hypertension. Hypertensive's are more in stage-I In 78 widowed males, 36(46.15%) were with normal blood pressure , 17(21.79%) pre-hypertensives and 25(32%)

with hypertension. Stress may be the cause of being more hypertensives in widows. Out of 863 married females, 708(82.03%) with normal blood pressure, 28(3.24%) pre-hypertensives and 127(14.71%) hypertensives.Out of 107 un-married females, 90(84.11%) are with normal blood pressure , 15(14.01%) pre-hypertension and 02(1.86%) are hypertensives.Out of 123 widowed females 75(60.97%) were with normal blood pressure, 10(8.13%) pre-hypertensives and 38(30.89%) with hypertension.

Table:4 Distribution of blood pressure as per marital status.

MARITAL STATUS	TOTAL	JNC-7 CLASSIFICATION			(Stage-I+stage-II)
		pre-hypertension	stage-I	stage-II	HTN
Married	271(66.58)	43(42.57)	126(79.74)	105(70.94)	231 (75.49)
Unmarried*	43(10.56)	31(30.69)	2(1.26)	10(6.75)	12 (3.92)
Widowed	93(86.91)	27(26.73)	30(18.98)	33(22.29)	63(20.58)
Total	407(100)	101(100)	158(100)	148(100)	306(100)

*un-married young males and females(18-27 years)

$\chi^2=68.469$, $df=4$, $sig=0.000$

Out of 101 pre-hypertensives, 43(42.57%) married, 31(30.61%) un-married and 27(26.73%) were widowed. Out of 306 hypertensives, 231(75.49%) married, 12(3.92%) un-married and 63(20.58%) were widowed.

Distribution of hypertension as per marital status:

In my study hypertension was observed more in widowed males 32% and females 30.89%. Among males most of them were in stage-I hypertension 19.23% than stage-II 12.82% while as in females most of hypertensives were in stage-II, 18.67% than in stage-I, 12.19%.

DISCUSSION

The un-married in study were very young girls, awaiting marriage in near future. Marital status and marital transitions have indirect influences on health outcomes including hypertension through health risk behaviours and stress, and direct influences on cardiovascular, endocrine, immune, neurosensory and other physiological mechanisms. Due to the absence of partner support, the transition from being married to being widowed may be deleterious to health status. On the other hand, marital strain has deleterious effects on cardiovascular, endocrine, and immune functions as well. Marital strain can be viewed as a repeated or chronic social stressor [7]. Jacob John et al [8] concluded in their study that by using primary care workers to screen the hypertension through model suggested will ensure that the population over 50 years of age will be screened once every 2 years without burdening the worker and cater vulnerable population. In other study carried in Egypt [9], The national estimate of the prevalence of hypertension in Egyptians was 26.3%, slightly more prevalent in women (28.9%) than in men (25.7%). Before the age of 45 years, hypertension was more prevalent in men, while the reverse was true after age 45 years. Systolic hypertension was more common in women than men. Diastolic hypertension was more common in men than in women in all age groups. D J Raina, et al [10] in their study found the Prevalence of hypertension as 13% ; females 14.71%: males 11.19% showing a strong association between gender and hypertension (p value <.02). An increase in prevalence of hypertension with age (from 30-39yrs. to \geq 60yrs) from 6.67% to 37.78% in females (p value <.0001) & 4.5% to 18.69% in males (p value <.00001), showing a strong association between hypertension and age in both the sexes. Deewakar Sharma, et al [11] in their study found the Overall prevalence of hypertension 19.7% (22.2% in men and 17.3% women) Sharma BR et al [12] in their study in jammu & Kashmir, found the Prevalence of hypertension in adult population to be 8.31%. It was higher in females (10.8%) in comparison to males (6.34%), which was statistically significant (p<0.05). There was a consistent rise in prevalence rate from 1.4% to 31.93% with the increase in age group from 20-25 years to 55-60 years

in both sexes, which is highly significant (p<0.01). Marital status did not seem to contribute towards hypertension.

Haijiang Wang et al [7] in their study found that the Marital status and marital transitions have indirect influences on health outcomes including hypertension through health risk behaviors and stress, and direct influences on cardiovascular, endocrine, immune, neurosensory, and other physiological mechanisms. High dietary of sodium, lack of exercise, and higher levels of stress contribute to the greater likelihood of developing hypertension. Marital status and marital transitions are related to differentials in health behaviors. Marital and familial commitment may encourage married women and men to self-regulate their health risk behaviors. Women who are not in committed relationships have a higher likelihood of engaging in risky health behaviors. Specifically, married people are more likely to quit smoking, more likely to conform to dietary guidelines and less likely to smoke excessively. Behavioral changes that may accompany divorce and widowhood among women are a relapse in smoking, and poor diet. Exiting from the marital role is a stressful life event that leads to a decline in everyday social support and social control and is associated with depression. Social support from a husband and wife may help a woman/men to deal with stressful situations. Due to the absence of partner support, the transition from being married to being widowed may be deleterious to health status. On the other hand, marital strain has deleterious effects on cardiovascular, endocrine, and immune functions as well. Marital strain can be viewed as a repeated or chronic social stressor.

SUMMARY & CONCLUSION

The overall prevalence was 14.56%, 13.8% in males and 15.3% in females. 4.84%, 8.5% and 6.8% females were in pre-hypertension, stage-I and stage-II hypertension respectively. Among males 4.76% in pre-hypertension, 6.5% in stage-I and 7.3% were with hypertension.

The distribution of hypertension, among pre-hypertensives, 52.47% were females and 47.52% were males. Among hypertensive subjects, 54.47% were females and 45.42% were males.

Widowed study subjects had higher tendency to have hypertension 32% in males and 30.89% in females.

REFERENCES

1. Jan Ostergren of Sweden, s Karolinska University Hospital The associated press 2009, Health MSN Home. Available from <http://www.msnbc.msn.com/id/18660422/>
2. Gupta R; Trends in hypertension epidemiology in India. J Hum Hypertens, 2004;18(2):73-78.

3. Indian Guidelines for the management of hypertension-II 2007 published under the stewardship of API(Association of Physicians of India)
4. Gupta R , Gupta VP; Hypertension epidemiology in India: lessons from Jaipur Heart Watch. *current science*, 2009; 97(3):349-355.
5. RCH Action Plan 2007 of District Pulwama jammu and Kashmir, INDIA
6. Chobanian AV, Bakris GL, Black HR, Cushman WC, Green LA, Izzo JL Jr, Jones DW, Materson BJ, Oparil S, Wright JT Jr, Roccella EJ; Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure. *Hypertension*, 2003;42(6):1206-1252.
7. Wang H, Hopkins J; Effects of Marital Status and Transition on Hypertension in Chinese Women, A Longitudinal Study, Bloomberg School of Public health. Presented at the 2005 Annual Meeting of the Population Association of America, Philadelphia, Pennsylvania, 2005.
8. Jacob J, Muliyla J , Balraj V; Screening for hypertension among older adults : A primary care , High risk approach. *Indian journal of community medicine*, 2010; 35(1):67-69.
9. Ibrahim MM, Rizk H, Appel LJ, el Aroussy W, Helmy S, Sharaf Y, Ashour Z, Kandil H, Roccella E, Whelton PK; Hypertension prevalence, awareness, treatment, and control in Egypt. Results from the Egyptian National Hypertension Project (NHP). NHP Investigative Team. *Hypertension*, 1995;26(6 Pt 1):886-890.
10. Raina DJ, Jamwal DS; Prevalance Study of Overweight/Obesity and Hypertension Among Rural Adults, 2009; 11(1):20-23.
11. Sharma D, Bkc M, Rajbhandari S, Raut R, Baidya SG, Kafle PM, Baral B et al.; Study of Prevalence, Awareness and Control of Hypertension in a Suburban Area of Kathmandu, Nepal, *Indian Heart J*, 2006; 58(1):34-37.
12. Baldev R Sharma, Bhupinder singh. A Study of Hypertension in Adult population (20-60 years) of a Rural area of J& k State. 1997; 22 (4) : 155-159.