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RESEARCH ARTICLE

A STUDY TO SEE THE RELATIONSHIP OF DEMOGRAPHICS AND HYPERTENSION AMONG KASHMIRI POPULATION

[1]Dr. Shabir Dangroo, *[2]Dr. Sajad Hamid, [3]Dr. Muhammad Salim Khan and [4]Dr. Shahnawaz Hamid

[1]Department of Community Medicine, SKIMS Medical College, Bemina
[2]SKIMS Medical College,
[3]Community Medicine, GMC Srinagar
[4]Post- Graduate SKIMS Soura

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ABSTRACT

A community based cross-sectional descriptive study was carried out to assess the prevalence of hypertension with respect to demographic profile of kashmiri population. The study was taken from Oct. 2012 to Sept. 2013 in District Pulwama. The sampling method used was multistage, 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. 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 was Screened and two blood pressure readings 10 minutes apart after the subject was resting for at least 5 minutes in a sitting position, by mercury sphygmomanometer which was standardized; The first and the fifth Korotkoffs 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; 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. Hypertension was more observed in illiterates than educated population being 15.47% in illiterates and goes on decreasing as educational status increases. Lowest in postgraduates 7.14%.Hypertension was more in housewives 15.6% followed by farmers 14.1% and skilled workers 13%.

INTRODUCTION

Almost 1 billion people worldwide have high blood pressure, and over half a billion more will have this silent killer by 2025. It translates into millions of deaths from heart disease alone. 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 (Dr Jan Ostergren 2009). Cardiovascular diseases caused 2.3 million deaths in India in the year 1990; this is projected to double by the year 2020 (Ghattargi 2004). 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 (hypertension-II 2007). 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

Corresponding author: Dr. Sajad Hamid
SKIMS Medical College

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 epidemiology of hypertension in India and reports on a study to evaluate trends in hypertension in an Indian urban population and its proximate determinants (Rajeev Gupta and Gupta 2009).

Hypertension is one of the most important modifiable risk factors for CHD in western and Asian population Studies from India and Bangladesh 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. Both environmental and genetic factors may contribute to variations of blood pressure and hypertension prevalence. Hypertension is present in all populations except for a small number of individuals living in primitive, culturally isolated societies. Studies of societies undergoing "acculturation" and studies of migrants from a less to a more urbanized setting indicate a profound environmental contribution to blood pressure. Additional environmental factors that may contribute to hypertension include alcohol consumption, psychosocial stress, and low levels of physical activity. Hypertension represents a polygenic disorder in which a single gene or combination of genes act in concert with environmental exposures to contribute effect on blood pressure[5]. 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 was assessed in District Pulwama and is about 32 kilometres from Srinager city.

MATERIALS AND METHODS

A community based cross-sectional descriptive study was carried out to assess the prevalence of hypertension and evaluate the risk factors like, socio-demographic & life style. The study was taken from Oct. 2012 to sep. 2013.

Selection of population

District Pulwama was undertaken for the study, the total population of District Pulwama is 4,57,883, approximatly 56% of this population comprise 18 years and above population which is 2,56,414 (RCH Action Plan 2007).

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) ±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 about socio-demographic factors and life style. 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 socio-demographic factors like age, sex, marital status, total income and two blood pressure readings 10 minutes apart, by 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 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 ≥ 160 mmHg and diastolic ≥ 100 mmHg (Aram *et al.,* 2003).

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

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%)
Prevalence in illiterates	252 (15.47%)
Prevalence in primary pass	19 (13.38%)
Prevalence in middle pass	7 (11.47%)
Prevalence in matric pass	20 (10.98%)
Prevalence in intermediate	7 (9.58%)
Prevalence in postgraduate	1 (7.14%)
Mean age males	64±2.36 years range 23 to 85
Mean age females	53±2.34 years range 18 to 80

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

χ^2=3.352, df=3, sig= 0.340

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

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

χ^2=2.551, df= , sig= 0.279

Table 3. Prevalence of blood pressure as per marital status

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

χ^2=139.443, df=6, sig= 0.000(males); χ^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	JNC-7 CLASSIFICATION				(Stage-I+stage-II)
	TOTAL	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), χ^2=68.469, df=4, sig=0.000

Table 5. Prevalence of blood pressure as per age groups

SEX			JNC-7 CLASSIFICATION									
			n	NORMAL BP	pre-hypertension		stage-I	stage-II	HTN (stage-I+stage-II)			
Male	AGE GROUPS	18-31	400	386 (96.5)	9	(2.25)	4 (1.0)	1(0.25)	5 (1.25)			
		32-45	289	262(90.65)	13	(4.49)	1(0.34)	13(4.49)	14(4.84)			
		46-59	174	151(86.78)	7	(4.02)	9(5.17)	7 (4.02)	16(9.19)			
		>=60	144	21 (14.58)	19	(13.19)	51(35.41)	53(36.80)	104(72.22)			
	Total		1007	820	48		65	74	139			
Female	AGE GROUPS	18-31	441	412(93.42)	14	(3.17)	12 (2.72)	3 (0.68)	15 (3.40)			
		32-45	331	279(84.29)	16	(4.83)	23 (6.94)	13 (3.92)	36 (10.87)			
		46-59	185	139(75.13)	7	(3.78)	25(13.51)	14 (7.56)	39 (21.04)			
		>=60	136	43 (31.61)	16	(11.76)	33(24.26)	44(32.35)	77 (56.61)			
	Total		1093	873	53		93	74	167			

χ^2= 547 df= 9 sig=0.000(males), χ^2=291 df= 9 sig=0.000(females)

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.

Males: Out of 400, in 13-30 age group, 5(1.25) were hypertensive. In 289, in 32-45 age group 14(4.84) were hypertensive. In 174, 46-59 age group, 16(9.19) were hypertensive. In 144, ≥60 age group, 104(72.22) were hypertensive.

Females: Out of 441, in the age group of 18-31, 15(3.40) were hypertensive. In the age group of 32-45, 36(10.87) were hypertensive. Out of 185, 46-59 age group, 39(21.04) were hypertensive. Also in the age group of ≥60, study subjects 136, 77(56.61) were hypertensive.

Out of 139 males, 5(35.7) in the age of 18-31, 14(51.8) in the age group of 32-45, 16(69.45) in age group of 45-59 and 104(84.6) above were hypertensive .Out 167 females, 15(51.7) in age group of 18-31, 36(69.2) in 32-45, 39(84.7) in 45-59 and 77(52.8) are 60 years and above. Increases with increase in age. Out 1628 illiterate study subjects, 1346(82.67%) were with normal blood pressure, 30(1.84%) pre-hypertensives and 252(15.47%) hypertensives. In 142 primary pass. 107(75.35%) were with normal BP, 16(11.26%) pre-hypertensive and 19(13.38%) are hypertensive. Out of 61 middle pass, 38(62.29%) are with normal BP, 16(26.22%) pre-hypertensive and 7(11.47%) with hypertension.In 182 matric pass, 147(80.76%) with normal BP, 15(8.24%) pre-hypertensives and 20(10.98%) hypertension. In 73 intermediates, 54(73.97%)

Table 7. Distribution of blood pressure as per educational status

EDUCATIONAL STATUS	N	Normal BP	JNC-7 Classification			
			Pre-hypertension	Stage-I	Stage-II	Hypertension Stage-I+stage-II
Illiterate	1628	1346	30	136	116	252
		(82.67)	(1.84)	(8.35)	(7.12)	(15.47)
primary pass	142	107	16	4	15	19
		(75.35)	(11.26)	(2.81)	(10.56)	(13.38)
middle pass	61	38	16	2	5	7
		(62.29)	(26.22)	(3.61)	(8.19)	(11.47)
matric pass	182	147	15	12	8	20
		(80.76)	(8.24)	(6.59)	(4.39)	(10.98)
intermediate	73	54	12	4	3	7
		(73.97)	(16.43)	(5.47)	(4.10)	(9.58)
postgraduate	14	1	12	0	1	1
		(7.14)	(85.71)		(7.14)	(7.14)
Total	2100	1693	101	158	148	306

χ^2=343.609, df=15, sig=0.000

Table 8. Distribution of blood pressure as per educational status

Educational status	JNC-7 Classification				Total
	Pre-hypertension	Stage-I	Stage-II	Hypertension	
Illiterate	30 (29.70)	136(8.35)	116(7.12)	252 (82.35)	282(69.28)
Primary pass	16 (15.84)	4(2.81)	15(10.56)	19 (6.20)	35 (8.59)
Middle pass	16 (15.84)	2(3.61)	5(8.19)	7 (2.28)	23 (5.65)
Matric pass	15 (14.85)	12(6.59)	8(4.39)	20 (6.53)	35 (8.59)
Intermediate	12 (11.88)	4(5.47)	3(4.10)	7 (2.28)	19 (4.66)
Postgraduate	12 (11.88)	0	1(7.14)	1 (0.32)	13 (3.19)
Total	101 (100)	158	148	306 (100)	407 (100)

χ^2=24.735, df=4, sig=0.000

Table 9. Prevalence of hypertension as per occupation

Occupation	N	Normal BP	JNC-7 Classification			
			Pre-Hypertension	Stage-I	Stage-II	(Stage-I+stage-II) HTN
Farmer	843	698	26	57	62	119
		(82.79)	(3.08)	(6.8)	(7.4)	(14.1)
house wife	1039	849	28	90	72	162
		(81.71)	(2.69)	(8.7)	(6.9)	(15.6)
Household work*	36	19	15	2	0	02
		(52.77)	(41.66)	(5.6)		(5.6)
professional	20	1	17	1	1	02
		(5)	(85)	(5.0)	(5.0)	(10.0)
skilled worker	162	126	15	8	13	21
		(77.77)	(9.25)	(4.9)	(8.0)	(13.0)
Total	2100	1693	101	158	148	306

*un-married young females. χ^2=416.340, df=12, sig=0.000

Table 10. Distribution of hypertension as per occupation

OCCUPATION	JNC-7 CLASSIFICATION			HTN (stage-I+stage-II)	Total
	pre-hypertension	stage-I	stage-II		
Farmer	26	57	62	119	145
	(25.74)	(36.07)	(41.89)	(38.88)	(35.62)
house wife	28	90	72	162	190
	(27.72)	(56.96)	(48.64)	(52.94)	(46.68)
household work	15	2	0	02	17
	(14.85)	(1.26)	(0.0)	(0.65)	(4.17)
Professional	17	1	1	02	19
	(16.83)	(0.63)	(0.67)	(0.65)	(4.66)
skilled worker	15	8	13	21	36
	(14.85)	(5.06)	(8.78)	(6.86)	(8.84)
Total	101	158	148	306	407
	(100)	(100)	(100)	(100)	(100)

χ^2=102.075, df=8, sig=0.000

with normal bp, 12(16.43%) prehypertensives and 7(9.58%) with hypertension.In 14 postgraduates, 01(7.14%) with normal BP, 12(85.71%) prehypertensives and 01(7.14%) with hypertension. The above table suggests that subjects with higher education levels have lower prevalence of blood pressure. Out of 306 hypertensive study subjects, 252(82.35%) were illiterate, 19(6.20%) primary pass, 7(2.28%) middle pass, 20(6.53%) matric pass, 7(2.28%) intermediate and 01(0.32%) postgraduates. 119(14.1%) farmers are hypertensives, 162(15.6%) house wives, 2 (5.6%) household working un-married females, 02(10.0%) professionals and 21(13.0%) skilled workers were hypertensives. Highest prevalence in house wives (15.6%) may be due their sedentary habbits/ less physical acivity. Most of the skilled workers were Shawl Workers, Carpet Weavers, Chain stitch workers, all of them working indoor, with meagre physical activity. 119(38.88%) are farmers, 162(52.94%) house wives, 02(0.65%) household working un-married females, 02(0.65%) professional and 21(6.86%) skilled workers.

DISCUSSION

Distribution of hypertension as per gender

The overall prevalence of hypertension was 14.5% (306 out of 2100), 15.3% (167 out of 1093) females and 13.8% (139 out of 1007) males. Among females hypertension (167), more subjects were in stage-I hypertension 8.5% than in stage-II hypertension 6.8%. Among males more subjects were in stage-II 7.3% than in stage-I hypertension 6.5%. In a WHO India Report (8) an overall weighted pooled prevalence rate of hypertension was 15.74% found in various studies conducted in rural areas of India[9]. An ICMR study in 1994 involving 5537 individuals demonstrated prevalence of hypertension among males and females as 13% and 10% respectively in rural Haryana (ICMR). Bhat *et al*. (2002) April 2002, INDIAN PRACTIONERS, has done same study in pulwama district using JNC-V classification and his overall prevalence of hypertension was 8.6%, 6.7% in males and 10.4% in females, there is a gap of 8 years. Raina *et al*. (2009) Jan-March, JK Sciences, observed in rural Jammu the overall prevalence of hypertension 13%, 11.19% in males and 14.71% in females. There are geographical and dietary differences. Rajeeve Bhardwaj *et al*. (2010) Jully 2010 JAPI, observed in rural population of HP, overall prevalence of 35.89%.varied geographical, dietary factors. Sidu *et al*. (2005), Journal of Human ecology, observed in adult Panjabi females prevalence of 20.15%.

Distribution of hypertension as per age

In present study among males the prevalence of hypertension was increasing with increase in age, 1.25% in 18-31 age group, 4.84% in 32-45 age group, 9.19% in 46-59 age group and 72.22% in ≥60 age group. Similar results were seen in females, 3.40% in 18 to 31 age group, 10.87% in 32-45 age group, 21.04% in 46-59 age group and 56.61% in ≥60 age group. With advancing age the atherosclerotic changes make the blood vessels less distensible, so there is increase in blood pressure with increase in age, thus increasing mortality and morbidity. Similar findings were observed by Malhotra *et al*. (1999) in 1994-95, journal of human hypertension, Franklin M M White *et al*. Aug (1986), CMAJ, Ibrahim *et al*., Egypt (1999), Saudi Journal of Kidney Transplant, Sampti *et al*. (2009), IJCM Jully 2009 in rural Maharashtra.

Distribution of hypertension as per educational status

The prevalence of hypertension was highest in illiterates 15.47% and goes on decreasing with increase in educational status, being lowest in postgraduates 7.14%. This may be due to healthier life style in educated population. Ghattargi, Thite *et al*. (2009), also observed the same in rural Maharashtra in 2004.

Distribution of hypertension as per occupation

The prevalence of hypertension is more in house wives 15.6%, most of them being illiterate and having less physical activity. The next higher group were farmers 14.1%. Most of the farming these days is done by Behari Labourers and by adopting modern methods of farming, tractors instead of bullocks. Another cause may be illiteracy among farmers and un-healthier life styles.

Summary and Conclusion

1) 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.
2) 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.
3) Widowed study subjects had higher tendency to have hypertension 32% in males and 30.89% in females.
4) Hypertension was more observed in illiterates than educated population being 15.47% in illiterates and goes on decreasing as educational status increases. Lowest in postgraduates 7.14%.
5) Hypertension was more in housewives 15.6% followed by farmers 14.1% and skilled workers 13%.

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