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A CROSS SECTIONAL STUDY TO ASSESS EPIDEMIOLOGICAL FACTORS ASSOCIATED WITH HYPERTENSION IN A TERTIARY HEALTHCARE INSTITUTE

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ABSTRACT

Introduction: Hypertension is the emerging public health problem of adult population across the globe, affecting one in every four individuals. Essential hypertension is currently understood as a multifactorial disease arising from the combined action of many genetic, environmental, and behavioral factors. The present study was conducted to to assess demographic characteristics, clinical presentation and hence to study its association with duration of hypertension. **Materials and methods:** A hospital based cross sectional analytical study was conducted among 200 patients (100 study group and 100 control group) who attended the out-patient and in-patient at the department of Medicine from December 2015 to November 2017. **Results:** There was male preponderance in both the groups (63% and 65% respectively) while female patients constituted 37% and 35% of groups. The mean SBP values in Stage I and Stage II hypertensive patients in Cases Group were 143.36 ± 4.59 and 167.58 ± 16.22 mmHg respectively. **Conclusions:** 40 - 60 years is the commonest age of presentations of hypertensive disorders Systolic and diastolic blood pressures tends to be on increasing side and is proportional to duration of the disorder.

KEYWORDS: Hypertension, epidemiology of hypertension, complications, cardiovascular diseases.

INTRODUCTION

Hypertension is the emerging public health problem of adult population across the globe, affecting one in every four individuals.[1]

From its constantly rising prevalence, it is evident that hypertension is a very important public health challenge because its complications, including cardiovascular, cerebrovascular, and renal diseases, are mayor causes of morbidity and mortality. The etiological factors associated with hypertension is difficult to predict because hypertension results from a complex interaction of genes and environmental factors.[1]

In India cardiovascular diseases cause 1.5 million deaths annually. 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[38] 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.[2] Hypertension, defined as a systolic blood pressure ≥ 140 mmHg and/or a diastolic pressure ≥ 90 mmHg, is one of the most common chronic diseases.[3] Hypertension is due to specific causes in a small fraction of cases, but in the vast majority of individuals ($\approx 90\%$), its etiology cannot be determined; therefore, the essential hypertension term is employed.[4] Essential hypertension is currently understood as a multifactorial disease arising from the combined action of many genetic, environmental, and behavioral factors.[5,6] Various studies have shown association between various risk factors, duration of hypertension and development of cardiovascular complications.[7-10]

The present study was conducted to to assess demographic characteristics, clinical presentation and hence to study its association with duration of hypertension.

MATERIALS AND METHODS

A hospital based cross sectional analytical study was conducted among 200 patients (100 study group and 100 control group) who attended the out-patient and in-patient at the department of Medicine from December 2015 to November 2017. The sample size was calculated considering a confidence level of 95% and confidence interval of 7 as 196. Adult male and female patients > 18 years of age diagnosed as hypertensive according to JNC VII and VIII classification for hypertension were included as cases;[11] patients with Diabetes Mellitus, Ischaemic

Heart Disease, All cases of secondary hypertension, Clinical Findings of gout or extra- articular manifestations of hyperuricemia Obesity (body weight exceeding 25% of body weight), H/o alcohol abuse and red meat eaters, H/o Renal disease, H/o pre-eclampsic toxemia were excluded from the study. Controls were patients without hypertension were matched for age and sex with that of the cases. The clinical examination consisted of a medical history, a physical examination, blood pressure measurement and other routine investigations. Quantitative data is presented with the help of Mean and Standard deviation. Comparison among the study groups is done with the help of unpaired t test as per results of normality test. Qualitative data is presented with the help of frequency and percentage table. Association among the study groups is assessed with the help of Fisher test, student 't' test and Chi-Square test.

RESULTS

A hospital based cross sectional study was conducted with 200 patients to determine demographic characteristics of hypertension cases and hence to study association between duration of hypertension and blood pressures. The patients were divided into following two groups of 100 patients in cases and control groups each. Majority of the patients in Cases Group were in the age group of 51-60 years (34%) followed by 61-70 years (20%), 41-50 years (19%), 31-400 (13%), 71-80 years (6%), 20-30 years (5%) and 81-90 years (3%). The mean age of the patients was 54.6±13.27 years, whereas majority of the patients in Controls Group were in the age group of 31-40

years (24%) followed by 41-50 years (19%), 61-70 years (19%), 51-60 (14%), 20-30 years (12%) and 71-80 years (12%). The mean age of the patients was 49.6±16.71 years. There was significant difference between the groups as per Student t-test (**p=0.003**) (Table 1). There was male preponderance in both the groups (63% and 65% respectively) while female patients constituted 37% and 35% of groups. There was no significant difference between the groups as per Chi-Square test ($p>0.05$) (Figure 1). The mean SBP values in Cases and Control Groups were 160.80±17.72 and 118.56±7.99 mmHg respectively. The mean DBP values in Cases and Control Groups were 99.10±8.21 and 75.64±6.28 mmHg respectively. The difference in SBP and DBP values were statistically significantly as per Student t-test (**p<0.05**) (Table 2). The mean SBP values in Stage I and Stage II hypertensive patients in Cases Group were 143.36±4.59 and 167.58±16.22 mmHg respectively. The mean DBP values in Stage I and Stage II hypertensive patients in Cases Group were 90.57±1.71 and 102.42±7.28 mmHg respectively. The difference in SBP and DBP values were statistically significantly as per Student t-test (**p<0.05**) (Table 3). The mean SBP values in <5 years and >5 years hypertensive patients in Cases Group were 155.74±15.40 and 165.11±18.54 mmHg respectively. The mean DBP values in <5 years and >5 years hypertensive patients in Cases Group were 98.78±8.03 and 99.37±8.42 mmHg respectively. The difference in SBP values were statistically significantly as per Student t-test (**p<0.05**) (Table 4).

Table 1: Distribution of study participants according to Age.

Age (years)	Cases		Controls		Total
	N	**%**	**N**	**%**	
20-30	5	5%	12	12%	17
31-40	13	13%	24	24%	37
41-50	19	19%	19	19%	38
51-60	34	34%	14	14%	48
61-70	20	20%	19	19%	39
71-80	6	6%	12	12%	18
81-90	3	3%	0	-	3
Total	100	100%	100	100%	200
Mean ± SD	54.6 ± 13.27 years		49.6 ± 16.71 years		52.1 ± 15.25 years
Chi-Square Value (P-value)	19.512 (0.003)				

Table 2: Blood Pressure Levels of patients.

	Group	N	Mean	SD	t-value	p-value
SBP	**Cases**	100	160.80	17.72	21.732	<0.005
	Controls	100	118.56	7.99		
DBP	**Cases**	100	99.10	8.21	22.700	<0.005

Table 3: Association of Blood Pressure Levels and Stage of Hypertension in Cases Group.

	Stage of Hypertension	N	Mean	SD	T-value	P-value
SBP	**Stage-I**	28	143.36	4.59	-7.763	<0.001
	Stage-II	72	167.58	16.22		
DBP	**Stage-I**	28	90.57	1.71	-8.498	<0.001
	Stage-II	72	102.42	7.28		

Table 4: Association of Blood Pressure Levels and Duration of Hypertension in Cases Group.

	Duration of Hypertension	N	Mean	SD	T-value	P-value
SBP	**<5 years**	46	155.74	15.40	-2.720	0.008
	>5 years	54	165.11	18.54		
DBP	**<5 years**	46	98.78	8.03	-.355	0.723
	>5 years	54	99.37	8.42		
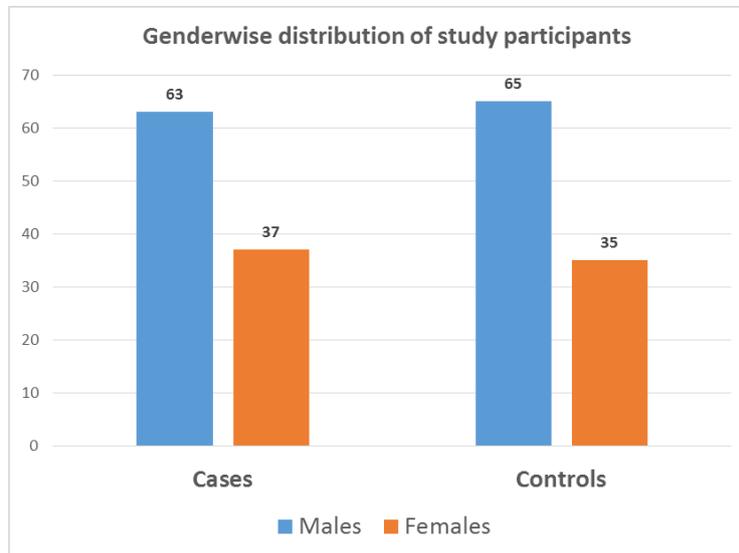
Figure 1: Distribution of patients according to Gender [Chi square value, p-value: 0.087 (0.768)].

DISCUSSION

In the present study, majority of the patients in Cases Group were in the age group of 51-60 years (34%) followed by 61-70 years (20%), 41-50 years (19%), 31-400 (13%), 71-80 years (6%), 20-30 years (5%) and 81-90 years (3%). The mean age of the patients was 54.6±13.27 years. Majority of the patients in Controls Group were in the age group of 31-40 years (24%) followed by 41-50 years (19%), 61-70 years (19%), 51-60 (14%), 20-30 years (12%) and 71-80 years (12%). The mean age of the patients was 49.6±16.71 years. There was significant difference between the groups as per Student t-test (**p=0.003**). There was male preponderance in both the groups (63% and 65% respectively) while female patients constituted 37% and 35% of groups. There was no significant difference between the groups as per Chi-Square test (p>0.05). In our study, the mean SBP values in Cases and Control Groups were 160.80±17.72 and 118.56±7.99 mmHg respectively. The mean DBP values in Cases and Control Groups were 99.10±8.21 and 75.64±6.28 mmHg respectively. The difference in SBP and DBP values were statistically significantly as per Student t-test (p<0.05).

Lee JJ et al.[12] (2015) study reported men between ages 40 and 59 showed similar results regarding diastolic BP. The association between serum UA and BP was stronger in women <40 (β = 0.54, p < 0.001 for systolic BP; β = 0.65, p < 0.001 for diastolic BP) and in between 40 and 59 (β = 0.51, p < 0.001 for diastolic BP). The association was not significant in men and women ≥60.

It was observed in the present study that the mean SBP values in Stage I and Stage II hypertensive patients in Cases Group were 143.36±4.59 and 167.58±16.22 mmHg respectively. The mean DBP values in Stage I and Stage II hypertensive patients in Cases Group were 90.57±1.71 and 102.42±7.28 mmHg respectively. The difference in SBP and DBP values were statistically significantly as per Student t-test (p<0.05).

Shrivastav C et al,[13] (2016) hospital based case control study investigating the existence of an association between serum uric acid and essential hypertension reported mean age, mean BMI, mean systolic and diastolic BP of control, preHT and HT group were highly significant (p<0.0001). Serum uric acid was found to be positively and significantly correlated with systolic blood pressure (SBP) (r= +0.23, p<0.05), whereas no significant correlation was found between serum uric acid and diastolic blood pressure (DBP) (r= +0.09, p>0.05).

It was observed in our study that the mean SBP values in <5 years and >5 years hypertensive patients in Cases Group were 155.74±15.40 and 165.11±18.54 mmHg respectively. The mean DBP values in <5 years and >5 years hypertensive patients in Cases Group were 98.78±8.03 and 99.37±8.42 mmHg respectively. The difference in SBP values were statistically significantly as per Student t-test (p<0.05).

Neki NS et al,[14] case control study on Serum Uric Acid level in Essential Hypertension reported mean serum uric acid in stage 1 hypertension was 5.37 ± 1.16 mg/dl and

those with stage 2 was 6.39 ± 1.3 mg/dl which was statistically significant. The mean SUA level in patients with hypertension < 5 years was 4.94mg/dl with a standard deviation of ± 0.830. The mean SUA level in patients with hypertension > 5 years was 6.93mg/dl with a standard deviation of ± 1.077.

CONCLUSIONS

From the present study we can conclude that, hypertension is the commonest of all the non-communicable disorders which follows the rule of halves. 40 - 60 years is the commonest age of presentations of hypertensive disorders. Systolic and diastolic blood pressures tends to be on increasing side and is proportional to duration of the disorder. And hence appears directly proportional to development of cardiovascular complications.

As a growing public health concern, apart from curative management, various preventive and health promotive aspects should be promoted as a component of universal health coverage.

Comprehensive behavior change communication strategies should be included in management guidelines of non-communicable diseases, in order to inculcate healthy and preventive practices among the people.

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