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Original Research Article

A cross sectional study of epidemiological determinants correlated with prevalence of hypertension among municipal school teachers located in suburban area

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ABSTRACT

Background: Hypertension is a major long-term health condition and is the leading cause of premature deaths among persons experiencing sedentary urban life style behaviors such as high calorie diet, lack of physical exercise and job stress. The objectives of the present study was to determine prevalence & various risk factors of hypertension among municipal school teachers in an urban slum.
Methods: The study area was a field practice area of tertiary care hospital in a metropolitan city. Municipal school teachers from suburban slums were the study participants. Teachers above 35 years of age and want to participate in study were included. The total sample size obtained was 220.
Results: 40% of the teachers were belonged to 35-40 years of age group. 70.9% of the study participants were women. Among 220 teachers 36.4% were having normal blood pressure. 43.6% teachers were in the pre-hypertension stage, while 14.5% and 5.5% were in stage- 1 and stage- 2 hypertension. The prevalence of hypertension was 20%. In present study it was found that as the age advances chances of contracting hypertension also increases [P=0.006]. Statistically significant relation between obesity and hypertension is seen [P=0.007]. There was a significant relation between physical activity and prevalence of hypertension [P = 0.021].
Conclusions: Increasing age, obesity and sedentary lifestyle are proportionally related to the development of hypertension which was statistically significant.

Keywords: Hypertension, Obesity, School teachers

INTRODUCTION

Hypertension is a major long-term health condition and is the leading cause of premature deaths among adults throughout the world.[1] A recent analysis of worldwide data from different regions estimated that the total number of adults with hypertension in 2000 was 972 million: 333 million in countries with established market economies and 639 million in economically developing countries. This proportion will increase by 60%- 1.56 billion-by 2025.[2] The magnitude of the hyper-tension burden countries to predict a worldwide cardiovascular disease epidemic.[3] The increasing prevalence of hypertension occurred in conjunction with a dramatic increase in the prevalence of overweight and obesity. The international obesity task force has estimated that at present at least 1.1billion adults are overweight including 312 million who are obese some studies have also been done in high risk groups having sedentary life styles, job stress, obesity and other risk factors.[4] School teachers in

urban area are experiencing sedentary urban life style behaviors such as vehicle use for transport, environmental pollution, high calorie diet, lack of physical exercise and sedentary behavior and job stress. The major sources of stress are colleagues, curriculum, parents, pupils, school authority, society, supervision/ teaching, teaching environment and wages (income).[5]

Hypertension and diabetes are two of the leading risk factors for atherosclerosis and its complications, including heart attacks and strokes. There is substantial overlap between diabetes and hypertension, reflecting substantial overlap in their etiology and disease mechanisms.[6] In reality, diabetes and hypertension are found in the same individual more often than would occur by chance, whereas the overlap between dysglycemia and raised blood pressure is even more substantial than that between diabetes and hypertension.[7] Blood pressure (BP) is directly associated with risks of several types of cardiovascular disease, and the associations of BP with disease risk are continuous, indicating that large proportions of most populations have non optimal BP values. Moreover, most or all BP-related risk appears to be reversible within a few years with inexpensive interventions. Hypertension is directly responsible for 57% of all stroke deaths and 24% of all coronary heart disease deaths in India.[8] The objectives of the study were to determine prevalence of Hypertension among the Municipal school teachers in an urban slum, to determine relations of various risk factors with occurrence of hypertension.

METHODS

The present community based cross sectional analytical study was carried out from October 2013 to September 2014 in an urban slum community adopted by a tertiary care teaching hospital. The study area was a field practice area of an Urban Health Centre attached to a Tertiary care hospital in a metropolitan city. Municipal School Teachers from Suburban slums were the study participants. Teachers above 35 years of age and want to participate in study were included. Teachers who were having Insulin Dependent Diabetes Mellitus & a pregnant female of any age group were excluded from the study. The sampling method used was Non Probability Convenience Sampling. By using formula N = [DEFF*Np(1-p)]/ [(d2/Z21-α/2*(N-1)+p*(1-p)] and considering the prevalence of hypertension in urban area 17% , confidence limit as 5% , and population of the study area 100000 the sample size comes to be 217 The consenting participants who satisfied the inclusion and exclusion criteria were enrolled in the study. Therefore taking into account all such factors of feasibility the total sample size obtained was 220. Frequency analysis for demographic variables was done and appropriate test of significance was done to test the association between demographic variables, risk factors and hypertension using SPSS version 20.0

RESULTS

The Present study is based on the observations of 220 School Teachers. As seen in the Table 1, 40% of the teachers belonged to 35-40 years of age group. 28 participants (12.7%) belonged to 41-45 years of age group. 40 participants (18.2%) were in the age group of 46-50 years. And 32 (14.5%) participants were in the age group of 51-55 and above 55 years. Gender wise distribution shows that majority i.e. 156 (70.9%) of the study participants were women. 184 (83.6%) participants were married and 36 (16.4%) were unmarried. majority of the teachers 196 (89.1%) belongs to Upper Middle Class according to modified Kuppuswami Classification. Majority of the participants i.e. 104 (47.3%) were Muslim by religion. 88 (40%) were Hindu while remaining 24 (10.9%) and 4 (1.8%) were Buddhist and Christians respectively.

Table 1: Sociodemographic profile of study participants.

		No of respondents	Percentage
Age (years)	35-40	88	40%
	41-45	28	12.7%
	46-50	40	18.2%
	51-55	32	14.5%
	>55	32	14.5%
Gender	Women	156	70.9%
	Men	64	29.1%
Marital status	Married	184	83.6%
	Unmarried	36	16.4%
Socio economic status	Lower middle	24	10.9%
	Upper Middle	196	89.1%
Religion	Hindu	88	40%
	Muslim	104	47.3%
	Buddhist	24	10.9%
	Christian	4	1.8%

Table 2 concludes that among 220 teachers only 80 (36.4%) were having normal Blood Pressure. 96 (43.6%) teachers were in the pre- hypertension stage, while 32 (14.5%) and 12 (5.5%) were in stage- 1 and stage- 2 Hypertension according to JNC – 7 criteria. Therefore after compilation of stage 1 and stage 2 hypertensive participants the prevalence of Hypertension comes to 20% in present study. After distributing school teachers on the basis of their BMI values distribution of teachers on the basis of their BMI values it shows that 32 (14.5%) teachers were obese while 64 (29.1%) teachers were overweight. 12 (5.5%) teachers out of 220 were under weight and 112 (50.9%) teachers were having normal BMI value. 94 (42.7%) school teachers were performing regular physical activity while 126 (57.3%) were not performing any regular physical activity. 88 (40%) teachers were vegetarian while 132 (60%) were having

mixed diet. Majority i.e. 148 (67.3%) were living in joint family.

Table 2: Classification of study participants on the basis of risk factors.

Status of BP	**Normal**	**80 (36.4%)**
	Pre- hypertensive	96 (43.6%)
	Stage-1 hypertension	32 (14.5%)
	Stage-2 hypertension	12 (5.5%)
Prevalence of HTN among participants	Normotensive	176 (80%)
	Hypertensive stage 1 & 2	44 (20%)
Classification on the basis of BMI value	Underweight	12 (5.5%)
	Normal	112 (50.9%)
	Pre- obese	64 (29.1%)
	Obese	32 (14.5%)
Physical activity in Participants	Performing	94 (42.7%)
	Not Performing	126 (57.3%)
Diet of participants	Vegetarian	88 (40.0%)
	Mixed Diet	132 (60.0%)
Type of the family	Nuclear	72 (32.7%)
	Joint	148 (67.3%)

After comparing age of the school teachers with their hypertension status, it is evident that as the age advances chances of contracting Hypertension also increases. The difference is statistically significant [chi sq. P = 0.006]. Similarly above table compares prevalence of hypertension among obese and non-obese teachers and the table depicts that, out of total 188 non obese teachers, 32 (17%) were having HTN. And out of total 32 obese teachers, 12 (37.5%) were having HTN. After applying chi square test, statistically significant relation between obesity and hypertension is seen [P = 0.007]. The prevalence of Hypertension was more (25.4%) among teachers who were not performing any physical activities than the teachers who were doing physical activity (12.8%) and it was found that there was a significant relation between physical activity and prevalence of hypertension (P = 0.021). Out of 88 vegetarian teachers, 15 (17.1%) were having hypertension and out of total 132 teachers who were consuming mixed diet, 29 (22%) were having hypertension. It was found that, teachers who were having mixed diet were at greater risk of developing hypertension. But it was not statistically significant. (P= 0.37). The relation between Type of family and Hypertension depicts that out of 148 teachers who were living in joint families, 36 (24.3%) were having hypertension and out of 72 teachers living in nuclear families, 8 (11.1%) were having Hypertension. From the above table we can come to a conclusion that the teachers who were living in joint families were having higher risk of hypertension and this difference was statistically significant.

Table 3: Relation of various risk factors with the hypertension.

Variables		Non hypertensive	Hypertensive	P value
Age of participants (years)	35-40	80	8	**0.006**
	41-45	20	8	
	46-50	32	8	
	51-55	24	8	
	>55	20	12	
Relation with obesity	Non obese	156	32	**0.007**
	Obese	20	12	
Relation with exercise	Performing	82	12	**0.021**
	Not performing	94	32	
Relation with diet	Vegetarian	73	15	0.37
	Mixed diet	103	29	
Relation with type of family	Nuclear	64	8	**0.022**
	Joint	112	36	

DISCUSSION

Present study showed that among 220 teachers 96 (43.6%) teachers were on pre- hypertension stage, while 32 (14.5%) school teachers were stage 1 hypertensive and 12 (5.5%) were suffering from stage- 2 Hypertension. Similarly, Kumar SV et al found a total number of 48 subjects were normotensive.[9] Overall 90 subjects were found to be pre-hypertensive and 38 (19%) were males and 52 (26%) were females. Ibrahim et al reported that less than one third (31.8%) of teachers were normotensive, 43.0 % were pre-hypertensive.[10] Regarding cases with diagnosed HTN, 13.1% were in stage I and 7.4% were in stage II HTN. In Ali HA et al study, the number of teachers with hypertension (both stage I and stage II) was 86(21.3%), about one fifth of the participants (20.4%) were pre-hypertensive.[11] In present study relation of age with hypertension signifies that as

the age advances chances of becoming hypertensive is also increases (p= 0.006). Similarly, the prevalence of hypertension was shown to increase with increasing age (p = 0.000) in Ibrahim et al study.[10] Leenen FH et al also found that there is a significant relation between the age and hypertension and as age advances the chances of becoming hypertensive is also increases.[12] Zhao XL et al conducted a study in china and found positive and statistically significant association between advancing age and prevalence of HTN.[13] After comparing prevalence of hypertension among obese and non-obese teachers it showed significant relation between obesity and hypertension. [p = 0.007] Similarly, Ibrahim et al had also found High BMI was associated with HTN; the prevalence of HTN was 14.4% for normal weight teachers compared to 21.9 % in overweight teachers and prevalence among obese individuals was 37.1%.[10] A highly statistically significant was present (p= 0.000). Bhadoria et al showed BMI ≥27.5 kg/m^2 to be significantly associated with HTN.[14] Ali HA et al showed the prevalence of hypertension was higher among obese teachers in comparison with those with normal weight.[11] Ghabrah et al showed that the prevalence of hypertension increased with age and of all the hypertensive teachers, 59.5% were obese.[15] There was a significant relation between physical activity and prevalence of hypertension (P = 0.021). As it was known that as the age advances frequency of doing exercise is also reduced. Hence prevalence of hypertension and diabetes was more found with increasing age. Similarly, Gupta SK et al found that there is a positive significant relation between physical activity and hypertension.[16] Another study conducted by Madhu et al had also showed significant association between sedentary life style and hypertension.[17] Relation of Diet with Hypertension showed that, out of 88 vegetarian teachers, 15 (17.1%) were having hypertension and out of total 132 teachers who were consuming mixed diet, 29 (22%) were having hypertension. It was found that, teachers who were having mixed diet were at greater risk of developing hypertension. But it was not statistically significant. (P= 0.37). Participants who were consuming mixed diet were found at higher risk than vegetarians as non-veg food requires more oil for cooking and it adds up several others factor (e.g. high cholesterol) also. Gupta GK et al found positive association between type of diet and hypertension.[18] Das OP et al found that prevalence of hypertension was significantly associated with diet habit.[19] In present study the teachers who lived in joint family was having higher risk of developing Hypertension and showing significant statistical values (p=0.022). In joint family there is a double responsibility of house hold work, house tension, work tension and all this factors signifies high prevalence of HTN and DM among joint families. Parikh S et al has found that the prevalence of hypertension was higher in the person living in joint family (31.8%) than in the nuclear family (18.3%) though the difference was not statistically significant (p>0.05).[20] Gupta GK et al showed a significant association with the type of family.[18] Similar results were found in the study by Kumar J et al in the rural adolescent of Wardha.[21]

CONCLUSION

From the present study we can conclude that the increasing age has a significant role in the development of hypertension. Obese participants are at greater risk for developing hypertension and sedentary lifestyle is directly related to the occurrence of hypertension. Also School teachers are at greater risk as they are exposed to the above several risk factors responsible for hypertension.

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