Original Research Article

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Evaluation of prevalence of hypertension and diabetes and its risk factors in a patients coming to the rural health training centre in district Panyel of Maharashtra

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ABSTRACT

Background: A systematic review done by Anchala et al concluded that one-third of urban adult Indians and close to one fourth of rural adult Indians are hypertensive. Overall prevalence of hypertension (HTN) in India, after weighting the regional population size, was 29.8%. As of 2014, 8.3% of the world's adult population suffered from diabetes, with low-income countries in Africa and Asia bearing the brunt of this burden. Objectives of this study were to evaluate the prevalence of hypertension and diabetes in patients coming to the rural health training centre (RHTC). To find out the association of selected risk factors with hypertension and diabetes.

Methods: It was a cross sectional study conducted in RHTC, Panvel Maharashtra in July 2019 (1 month) with sample size of 300.

Results: A total 133 patients had normal BMI, 124 were overweight and 48 were obese Out of total patients, 222 had normal blood pressure, 46 were pre- hypertensive and 32 were hypertensive. 42 patients had random blood glucose level more than 200 mg/dl.

Conclusions: There was association of body mass index, age and sex with both hypertension and high blood sugar level whereas association of addiction was present with high blood sugar level.

Keywords: Rural area, Hypertension, Diabetes, Risk factors

INTRODUCTION

Hypertension (HTN) is defined as a state of chronically elevated arterial blood pressure, as compared to what is normally expected, as per the defined level given in JNC VIII. HTN is an iceberg disease.¹

According to World Health Report 2002, cardiovascular diseases (CVDs) will be the largest cause of death and disability by 2020 in India. In 2020 AD, 2.6 million Indians are predicted to die due to coronary heart disease which constitutes 54.1% of all CVD deaths. Nearly half of these deaths are likely to occur in young and middleaged individuals (30-69 years).² HTN is directly

responsible for 57% of all stroke deaths and 24% of all coronary heart disease (CHD) deaths in India.³

A systematic review done by Anchala et al, concluded that one-third of urban adult Indians and close to one fourth of rural adult Indians are hypertensive.⁴ Overall prevalence of HTN in India, after weighting the regional population size, was 29.8% (95% CI: 26.7-33.0; I 2¹/₄ 79.8%, p<0.001).

As of 2014, 8.3% of the world's adult population suffered from diabetes, with low-income countries in Africa and Asia bearing the brunt of this burden.⁵ India's prevalence of diabetes is 7.8% and rising, and some areas are experiencing prevalence rates as high as 18%.⁶ Further,

while typically considered a problem of the urban affluent, diabetes has become a serious concern among rural populations and is contributing to widening health gaps. A review of studies in rural India conducted by Misra and colleagues found that prevalence increased from 1.9% in 1994 to upwards of 12% in 2009. In addition, rural prevalence rates of impaired glucose tolerance (IGT, a form of pre-diabetes) range from 5.5% to 7.2%. Such figures are concerning, especially considering 72.2% of the Indian population live in rural areas characterized by poverty, isolation, and poor access to health services. In

The prevalence of diabetes continues to be higher in urban areas than in rural areas, as has been shown previously. However, the rural prevalence estimates that we report here are much higher than identified in earlier studies. Given that about 70% of India's population resides in rural areas, even a small increase in the rural prevalence of diabetes will translate into several millions of individuals requiring chronic care. ¹³

Objectives of this study were

- To evaluate the prevalence of HTN and diabetes in patients coming to the RHTC
- To find out the association of selected risk factors with HTN and diabetes.

METHODS

The cross-sectional study at rural health training centre (RHTC), Panvel Maharashtra in July 2019 (1 month).

Study sample size

The formula used to get the sufficient sample size- 4pq/l²

We have considered prevalence of HTN is 30%. Therefore, p=30, q=70

L= allowable error is 20% of prevalence.

Sample size=
$$4\frac{pq}{l \times l} = 4\frac{30 \times 70}{6 \times 6} = 233.3$$

We included 300 participants in our study.

Inclusion criteria

All the adult patients who come to RTHC and gave consent were included in the study.

Exclusion criteria

All the participants who did not give consent were excluded from the study.

A structured, pretested questionnaire will be used to collect the data with regards to the socio-demographic characteristics (age, gender, religion and the

socioeconomic status) and the blood pressure pattern. The modified Prasad's classification was applied to measure the individual's socioeconomic status.

Anthropometric and clinical assessment

We measured bodyweight, height, waist circumference, and blood pressure using standardized techniques. ¹⁴ We calculated BMI by dividing bodyweight in kg by the square of height in meters. We diagnosed HTN if individuals were on antihypertensive medications or had a systolic blood pressure of 140 mm Hg or higher, a diastolic blood pressure of 90 mm Hg or higher, or both. ¹⁵ We defined abdominal obesity as a waist circumference of 90 cm or more for men and 80 cm or more for women, with or without generalised obesity. ¹⁶ We defined generalised obesity as a BMI of 25 kg/m² or higher for both men and women (definition based on the WHO Asia Pacific Guidelines), with or without abdominal obesity. ¹⁶

We have taken only random BSL values

We measured fasting capillary blood glucose (CBG) with a glucose meter

Current smoking was defined as self-reported smoking of tobacco products daily or on some days in the past 6 months, and current alcohol use was defined as self-reported use of alcohol irrespective of duration and quantity consumed.

Ethical committee

Approval An ethical approval for the study will be obtained from the institutional ethical committee

Statistical analysis

The data entry and the statistical analysis will be performed by using Microsoft Excel and the Statistical Package of Social Sciences (SPSS), Windows version 20.0 software. The tests of significance like the Pearson's Chi-square test, the Student's t test will be used whenever required.

RESULTS

Total 300 patients were included in the study out of which 121 (40.3%) were male and 179 (59.6%) were female. Table 1 show the classification of study sample according to age, sex, education, socioeconomic status and BMI. 39 patients were more than 51 years of age and 74 were from age group of 41 to 50 years of age. 98 were from between 18 to 30 years of age and 89 were between 31 to 40 years of age.

Out of total, 266 were married and 34 were unmarried.69 were illiterate, 207 were educated up to primary, 19 were up to secondary and 5 were educated up to higher education.

Table 1: Age, sex, education and socioeconomic status of study population.

Parameters	Male	Female
	N (%)	N (%)
Age group in years		
18 to 30	31 (25.6)	67 (37.4)
31 to 40	34 (28)	55 (30.7)
41 to 50	37 (30.5)	37 (20.6)
More than 51	19 (15.7)	20 (11.1)
Marital status		
Married	111 (91.7)	155 (86.5)
Not married	10 (8.2)	24 (13.4)
Education		
Illiterate	26 (21.48)	43 (24)
Primary	83 (68.5)	124 (69.2)
Secondary	9 (7.4)	10 (5.5)
Higher	3 (2.4)	2 (1.1)
Socioeconomic status		
Lower	33 (27.27)	44 (24.5)
Upper lower	75 (61.9)	114 (63.6)
Lower middle	13 (10.7)	21 (11.7)
Body mass index		
18.5 to 24.99 (normal)	51 (42.1)	82 (45.8)
25 to 29.99 (Overweight)	55 (45.4)	69 (38.5)
30 to 34.99(Obese I)	9 (7.4)	16 (8.9)
35 to 39.99 (Obese II)	10 (8.2)	10 (5.5)
More than 40 (Obese III)	1 (0.8)	2 (1.1)
Total	121	179

Majority i.e., 189 were in class of upper lower, 77 were come under lower class and 34 were come under lower middle class according to Kuppuswamis classification.

A total 133 patients had normal BMI, 124 were overweight and 48 were obese.

Out of total patients, 222 had normal blood pressure, 46 were pre-hypertensive and 32 were hypertensive. 42 patients had random blood glucose level more than 200 mg/dl. Prevalence of HTN was 10.6% and that of diabetes mellitus was 14%.

Table 2: Blood pressure and blood sugar level in truck drivers during examination.

Pland programa laval	Male	Female			
Blood pressure level	N (%)	N (%)			
Normal or less than 120/80 mmHg	42 (34.7%)	72 (40.2%)			
120-129/less than 80	36 (29.75%)	72 (40.2%)			
130-139/80-89	26 (21.4%)	20 (11.1%)			
140 and more/90 and more	17 (14%)	15 (8.3%)			
Total	121	179			
Blood sugar level (random) in mg/dl					
<200 mg/dl	104 (85.9%)	154 (86%)			
>200 mg/dl	17 (14%)	25 (14%)			
Total	121	179			

Table 3: Comparison of various factors with HTN and diabetes.

Parameters	Blood pressui	Blood pressure		Blood sugar (random)	
	Normal	HTN	<200 mg dl	>200 mg/dl	
Age					
20 to 30 year	96	2	85	13	
31 to 50 years	79	10	70	19	
More than 51 year	93	20	103	10	
P value	0.000		0.085		
Sex					
Male	104	17	104	17	
Female	134	15	154	25	
P value	0.019		0.000		
Socioeconomic status					
Class 1	66	11	61	16	
Class 2	171	18	168	21	
Class 3	31	3	29	5	
P value	0.301		0.119		
Body mass index					
18.5 to 24.99 (Normal)	124	9	114	19	
25 to 29.99 (Overweight)	111	8	108	11	
30 to 34.99 (Obese I)	15	10	21	4	
35 to 39.99 (Obese II)	17	3	13	7	
More than 40 (Obese III)	1	2	2	1	
P value	0.000		0.032		
Addiction					
Yes	84	10	81	13	
No	206	22	177	29	
P value	0.320		0.003		

DISCUSSION

When we compare few epidemiological factors with blood pressure and random blood glucose level, we found that, age of patients was significantly associated with both high blood pressure as well as high blood glucose level (p<0.000 for HTN and p<0.085 for DM).

Sex was also associated with both (p<0.019 for HTN and p<0.000 for DM). Body mass index was found to be associated with both (p<0.000 for HTN and p<0.032) for DM

A systematic review done by Anchala et al, show the prevalence of HTN was about 30% which is much more than finding of our study which was about 10.6%.⁴ Ramachandran A et al, show that rural prevalence rates of impaired glucose tolerance (IGT, a form of pre-diabetes) range from 5.5% to 7.2% and we found prevalence of diabetes was about 14%.⁹

Limitation of this study was the sample size is small, we cannot generalized the results with total population.

CONCLUSION

Prevalence of HTN was 10.6% and that of diabetes mellitus was 14%. In our study, we found association of body mass index, age and sex with both hypertension and high blood sugar level whereas association of addiction was present with high blood sugar level.

Recommendation

Similar study with large sample size could be conducted in future to find out various epidemiological determinants associated with diabetes and hypertension.

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Conflict of interest: None declared

Ethical approval: The study was approved by the

Institutional Ethics Committee

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