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Original Research Article

Burden of undiagnosed and uncontrolled hypertension and its associated factors among rural populations in South Andaman Islands, India

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ABSTRACT

Background: Elevated BP is an important risk factor of cardiovascular diseases; undiagnosed and uncontrolled hypertension is a dangerous situation where target organ damage can occur leading morbidity and mortality in apparently healthy individuals. Therefore, with an aim to study the burden of undiagnosed and uncontrolled hypertension, this study with a cross sectional study design is undertaken in rural areas of South Andaman Islands.
Methods: A community based cross sectional study. A total of 405 participants (Men: 175, Women: 230) were involved, mean age 48.36±15.16 years (Men: 50.69±16.01 years, Women: 46.58±14.26 years).
Results: 30.4% of the participants reported that they are known hypertensives, and out of them only 63.41% were on regular treatment. 17.8% of the participants were first time diagnosed with hypertension during this study. Overall, 48.1% of participants are having hypertension (known hypertensives±newly diagnosed hypertensives), and only 63.20% of them know their status on hypertension. A large proportion are in Pre-hypertension status (52.04%).
Conclusions: Almost half of the population are having burden of hypertension, and nearly 1/3rd of them do not know that they have hypertension; and among those who know the status, only 2/3rd of them are on regular treatment; and a large proportion of population is in pre-hypertension. We need to undertake rigorous efforts to unmask, diagnose and treat hypertension in the community.

Keywords: Andaman, Hypertension, Uncontrolled, Undiagnosed, Rural

INTRODUCTION

Elevated BP is an important risk factor of cardiovascular diseases. Undiagnosed and uncontrolled hypertension is a dangerous situation where target organ damage can occur leading morbidity and mortality in apparently healthy individuals. In 1999, according to a study conducted by Gupta R., by title, "Hypertension in India-definition, prevalence and evaluation" it was shown that the prevalence of hypertension with high Blood pressure in general population was 1.1% to 5.7%.[1] According to NFHS-5, 24% of men aged 15 and over and 21% of women aged 15 and over are having hypertension i.e., a massive increase of 20% in prevalence over two decades and shows that it is essential to understand the pattern and risk factors for hypertension, which is an important risk factor for cardiovascular diseases. In Andaman and Nicobar Islands elevated BP prevalence with 30.2% among men and 25.3% among women is an alarming situation to the health system.[2]

Global burden of diseases study estimated that hypertension led to 1.63 million deaths in India in 2016 as compared to 0.78 million in 1990 (+108%). The disease

burden (DALYs) attributable to hypertension increased from 21 million in 1990 to 39 million in 2016 (+89%), these evidences suggest that hypertension is a growing public health burden in Indian population.[8]

Andaman and Nicobar Islands are Union Territory of India consisting of 836 Islands/Islets/Rocky Outcrops, of which 38 are inhabited, these Islands are unique as they are situated in the South-Eastern part of Bay of Bengal and around 1200 km away in the ocean from the mainland of India.[13] Healthcare delivery for these Islands is of challenging nature because of the rural and remote nature of the geographical locations of these Islands.

Therefore, to study the burden of undiagnosed and uncontrolled hypertension, this study is undertaken in rural areas of South Andaman Islands.

METHODS

A community based cross-sectional study was conducted in rural areas of South Andaman Islands between October 2021 to February 2023, sample size was calculated by using the formula for estimation of proportion for one sample situation to detect prevalence of 24.95% of Hypertension among adults, the minimum sample size required was 376 with allowable error of 5% and design effect of 1.3, however a total of 405 individuals participated in the study.[2] Adults aged ≥18 years, living in rural areas of South Andaman Islands were included in the study.

Out of 99 revenue villages in the South Andaman District, 11 villages were selected in consultation with the Gram Panchayats, and in these villages, consecutive house to house visits were carried out by front line health functionaries, and adults aged ≥18 years who were willing to provide informed consent and participate in the study from those localities were mobilized for the study, a team of trained experts conducted interviews and recorded necessary information at a central location in these villages. Seriously ill and bed ridden individuals were excluded from the study. Written informed consent was obtained from the participants and data was collected using a predesigned, pretested, structured, modified version of WHO STEPS surveillance questionnaire. Ethical approval was taken from Institutional Human Ethics Committee of ICMR – Regional Medical Research Centre, Port Blair.

RESULTS

A total of 405 participants (Men: 175, Women: 230) were involved, mean age 48.36±15.16 years (Men: 50.69±16.01 years, Women: 46.58±14.26 years). Sociodemographic profile of the participants are shown in Table 1.

A total 30.4% of the participants reported that they are known hypertensives, and out of them only 63.41% were on regular treatment and remaining were irregular with treatment despite of being aware of their hypertension status. 17.8% of the participants were first time diagnosed with hypertension during the study. Overall, 48.1% of participants are having hypertension (Known hypertensives + Newly diagnosed hypertensives), and only 63.20% of them know their status on hypertension, and nearly 1/3rd of them do not know that they have hypertension, among remaining individuals, a large proportion are in Pre-hypertension status (52.04%).

Table 1: Socio - demographic profile of participants.

Variables		Frequency	Percent
Gender	Male	175	43.2
	Female	230	56.8
Religion	Hindu	307	75.8
	Muslim	38	9.4
	Christian	60	14.8
Type of family	Nuclear	233	57.5
	Joint	172	42.5
Socio - economic status	>= 7863	37	9.1
	3931 - 7862	38	9.4
	2359 - 3930	49	12.1
	1179 - 2358	116	28.6
	<1179	165	40.7
Level of education	No formal education	78	19.3
	Primary school	148	36.5
	Secondary / High school	140	34.6
	College / Graduate	39	9.6
Caste background	General caste	281	69.4
	Backward caste	123	30.4
	Refused to disclose	1	0.2
Marital status	Never married	35	8.6
	Currently married	325	80.2
	Divorce / Separated / Widowed	45	11.1

Being an elderly person, being a Christian compared with other religions, being an illiterate/having lower educational status, separated or divorced in marital status, using smokeless tobacco and being a person of overweight or obese are having higher chances of having hypertension. In binary logistic regression with all above factors, it was found that being a person with elderly age (P<0.01) and being overweight or obese (P<0.01) are the factors associated with hypertension.

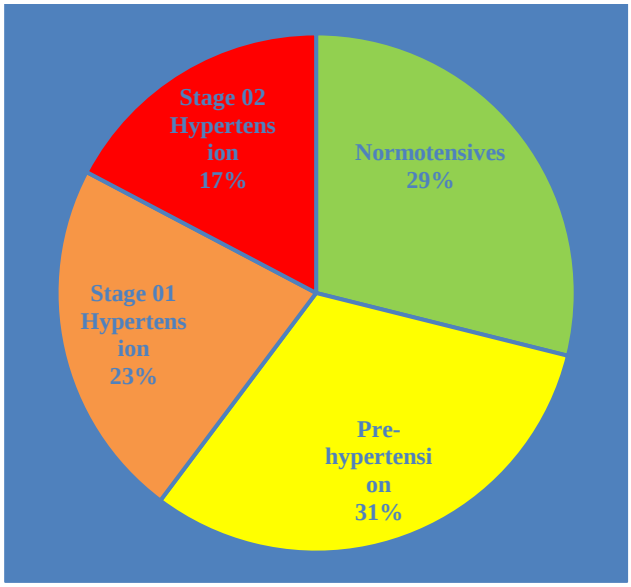

Figure 1: Status of hypertension and pre-hypertension in the community.

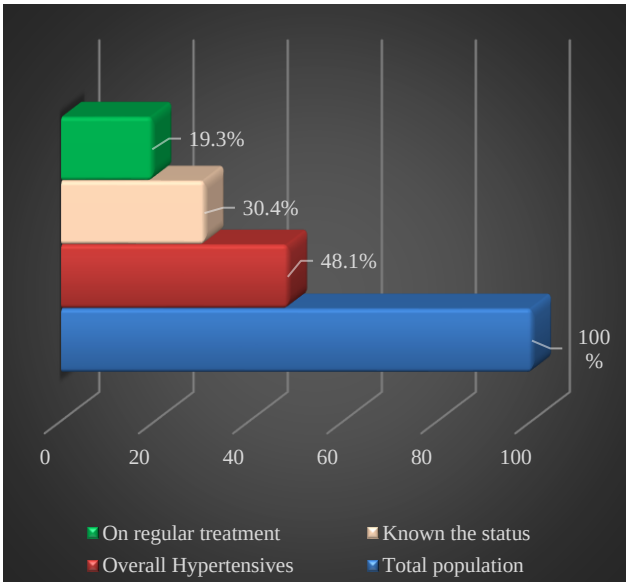

Figure 2: Status of hypertension care in the community.

Table 2: Results of binary logistic regression analysis.

Particulars	Percentage of hypertensives	P value	Odds ratio	95% CI
Age groups (in years)				
18-29	12.80	0.000	0.042	(0.013 to 0.136)
30-39	26.80	0.000	0.090	(0.040 to 0.199)
40-49	36.70	0.000	0.126	(0.061 to 0.263)
50-59	61.40	0.003	0.325	(0.156 to 0.679)
60 and above	78.40	Ref.		
Religion				
Hindu	47.60	0.370	0.730	(0.366 to 1.453)
Muslim	34.20	0.029	0.311	(0.109 to 0.886)
Christian	60	Ref.		
Level of education				
No formal education	69.20	0.57 0	0.745	(0.270 to 2.057)
Primary school	52.70	0.453	0.719	(0.304 to 1.701)
Secondary/high school	33.60	0.136	0.520	(0.220 to 1.229)
College/graduate	41	Ref.		
Marital status				
Never married	28.60	0.998	0.998	(0.280 to 3.566)
Currently married	47.40	0.691	0.848	(0.377 to 1.909)
Divorce/Separated/Widowed	68.90	Ref.		
Smokeless tobacco use				
Yes	55.70	0.240	1.336	(0.824 to 2.168)
No	41.90	Ref.		
Body mass index				
Underweight	23.10	0.000	0.152	(0.059 to 0.394)
Normal	42.90	0.000	0.364	(0.219 to 0.606)
Overweight/obese	59.40	Ref.		

DISCUSSION

In 2019, a National level survey was conducted across 24 States, in which blood pressure was recorded for 180,335 participants and overall prevalence of hypertension was 30.7%, but proportion of hypertensives reported is high in our study.[3] Mohanty et al, conducted a study on "Awareness, treatment, and control of hypertension in

adults aged 45 years and over and their spouses in India: A Nationally representative cross-sectional study", hypertension prevalence was estimated to be 41.9% and awareness, treatment and control of hypertension were low among older adults in India.[4]

In 2020, random-effects meta-analysis was used to pool the prevalence estimates and to perform subgroup analyses to estimate the prevalence of hypertension in Bangladesh, and it was found out that, prevalence of hypertension was high and rising, literature evidences have shown in India that prevalence of hypertension is on the rise in Indian population.[1,2,5,8]

Mukherjee et al, conducted a study on "prevalence of obesity and hypertension among the adult Bhantus of Andaman, India: a preliminary study", in their study, prevalence of general obesity was found out to be 40.7% and that of hypertension as 26.6%.[6] It was also shown that there was a positively significant age effect on both obesity and hypertension, in our study focussing on South Andaman Islands, we have estimated that 59.4% are overweight / obese and a higher proportion of population are having problems of hypertension, and there is a significant association between overweight and obesity with hypertension.

Hazarika et al, did a report of the systematic review and meta-analysis of the literature on the prevalence of hypertension among Indian tribes by following the PRISMA guidelines. The studies covered tribal populations in different regions of India. The pooled prevalence of hypertension among men, and women were 23.66%, and 23.37% respectively and it was found that the prevalence is rising.[7]

According to the study conducted by Manimunda et al, on "Association of hypertension with risk factors and hypertension related behaviour among the aboriginal Nicobaresse tribe living in Car Nicobar Island, India"; the prevalence of hypertension was 50.5%. The prevalence of tobacco, alcohol consumption, and obesity was 88, 54, and 37 per cent respectively. The association was found between prevalence of hypertension and prevalence of tobacco, alcohol consumption, and obesity. The prevalence of hypertension among Nicobarese was high and was much more than the rural and urban populations in India.[9] In our study we have estimated almost similar burden of hypertension, overweight and obesity among rural population in South Andaman Islands.

CONCLUSION

Almost half of the population are having burden of hypertension, and nearly 1/3rd of them do not know that they have hypertension; and among those who know the status, only 2/3rd of them are on regular treatment; and a large proportion of population is in pre-hypertension; this indicates that elevated blood pressure is a major public health problem in South Andaman, and diagnosed hypertensives are representing only a tip of the ice berg, and a large portion of the burden is not visible; therefore, we need to undertake rigorous efforts to unmask, diagnose and treat hypertension in the community.

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