Prevalence of hypertension and prehypertension among doctors of different specialties in a tertiary-care teaching hospital in Eastern India and its correlation with body mass index

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Abstract

Background: Hypertension is a very important risk factor for cardiovascular and cerebrovascular diseases. The number of patients with hypertension is estimated to rise from 118 million in 2000 to 214 million in 2025. The prevalence study of hypertension and prehypertension among the doctors in India is lacking.

Objective: To find out the prevalence of prehypertension and hypertension among doctors of different disciplines in a tertiary-care teaching hospital of West Bengal, India, and show any possible correlation between the mean blood pressures (BPs).

Materials and Methods: After getting consent from the doctors, the following data were recorded: height, body weight, systolic and diastolic BPs, smoking history, drug history, and family history. Three recordings of BP were measured, and the average was taken. Definitions of prehypertension and hypertension were standardized from Joint National Committee 8 criteria.

Result: One-fourth of the participant doctors were found to be normotensive, 14.82% of the doctors showed hypertension, and 60.49% of doctors showed prehypertension. This study also showed a significant positive correlation between body mass index and mean BP of the subject. This study also showed the impact of smoking and family history on the mean BP of the subject.

Conclusion: This study indicates that the prevalence of prehypertension and hypertension is not at all less than the rest of the Indian population. Rather, the risk factors such as raised body mass index and smoking are very common among the doctors.

KEY WORDS: Hypertension, prehypertension, doctors, prevalence, body mass index

Access this article online	
Website: http://www.ijmsph.com	Quick Response Code:
DOI: 10.5455/ijmsph.2016.02092015117	

Introduction

Hypertension is a very important risk factor for cardiovascular and cerebrovascular diseases. It affects about 25% of the adult population worldwide. The Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure defines hypertension as systolic blood pressure (SBP) >140 mm Hg or diastolic blood pressure (DBP)

>90 mm Hg. Persons with SBP of 120–139 mm Hg or DBP of 80–89 mm Hg are defined as showing "prehypertension." Prehypertensive subjects show a greater risk of developing hypertension in later life and major cardiovascular events independent of other risk factors.[1] The number of patients with hypertension is estimated to rise from 118 million in 2000 to 214 million in 2025, with almost equal numbers of men and women.[2]

In a study conducted in Madrid, Spain, it was found that the differences between the prevalence of hypertension in doctors and that of rest of the working population is not significant as expected.[3]

A survey of 26,000 adults in South India showed a hypertension prevalence of 20%, but 67% of hypertensives were unaware of their blood pressure (BP).[4] The majority of hypertensive subjects still remain undetected. This indicates the need for early detection and control measures. For each known person with hypertension, there are almost two persons with undetected hypertension or prehypertension. Studies on prehypertension provide an estimate of the future magnitude of the problem. It will help in developing strategies for the control of cardiovascular disease.[5]

A study done in Karnataka in people aged above 30 years showed the prevalence of hypertension was 43.3% and the prevalence of prehypertension was 38.7%.[6] A study on young Indian physicians detected that doctors showed a higher prevalence of hypertension, when compared with the general population (35.6% vs. 27%); similarly, a higher prevalence of obesity (55.55% vs 35.8%) was also observed.[7] A Saudi Arabian study in 2013 revealed that the prevalence of hypertension was 28% among the health professionals.[8]

Reducing the BP can decrease cardiovascular risk and reduce the development of other metabolic problems. This can be achieved by lifestyle measures in mild cases and should be the initial approach to hypertension management in all cases. Detecting and treating hypertension in doctors is very important, as they need to stay fit for longer years to serve a huge number of patients in India and there is always dearth of physicians when compared with the large population of India. But, such study of hypertension and prehypertension among doctors in India is lacking. So, this study can reflect that matter to some extent.

The primary objective of the study was to find out the prevalence of prehypertension and hypertension among doctors of different disciplines in the College of Medicine and JNM Hospital, Kalyani, West Bengal, India, a tertiary-care teaching hospital of West Bengal.

The secondary objectives were, first, to show any possible correlation between the mean BP and BMI and, second, to assess the influence of other risk factors (smoking, family history) on the prevalence of prehypertension and hypertension.

Materials and Methods

This cross-sectional study was carried out after getting clearance from the Institutional Ethics Committee. All standards of good clinical practice were adhered including a detailed informed consent to participate in the study. Doctors of different disciplines of College of Medicine and JNM hospital, Kalyani, West Bengal, India, were provided with the protocol, and their consent for participation in the study was asked for. The following data were collected after obtaining their consent:

1. Height (in inches, to be converted in meters)
2. Body weight (in kilograms)
3. Risk factors such as smoking, family history, and diabetes mellitus
4. Drug history

BMI is calculated using the standard international formula, BMI = weight (kg)/height (m)^2

To measure BP, a mercury sphygmomanometer was used. It was ensured that no smoking or caffeine ingestion or exercise half-an-hour prior to the checking of their BP. A cuff bladder encircling at least 80% of the arm circumference was applied to the nondominant arm. The disappearance of phase V Korotkoff sounds were taken as the DBP reading. The mean of three readings, recorded 2 min apart, was taken. If these readings differed by more than 5 mmHg, a further set of three readings were recorded at 2 min intervals, and the mean of all the six readings were taken.

The individuals were categorized as normotensives, prehypertensives, and hypertensives as per JNC 8 criteria.

Doctors with SBP <120 mm Hg and DBP below 80 mm Hg were categorized as normotensives, The subjects with SBP 120–139 mm Hg or DBP 80–89 mm Hg were categorized as prehypertensives, and SBP >140 mm Hg or DBP >90 mm Hg were categorized as hypertensives.

The mean BP was calculated by adding diastolic pressure and one-third of pulse pressure.

In the Indian context, BMI from 18 to 22.49 is regarded as normal, between 22.5 and 24.99 overweight, and above 25 obese.

SPSS software, version 22 was used for statistical analysis.

Statistical Analysis

The percentages of doctors in normotensive, prehypertensive, and hypertensive ranges were measured. The correlation between the BMI and mean BP was then calculated. The correlation between the age of the subjects and mean BP was also calculated. Moreover, by unpaired *t*-test, the difference of mean BP among smokers and nonsmokers and among doctors with positive vs. negative family history for hypertension were calculated.

Result

Data from 162 faculty doctors were obtained. Among them, 110 (67.9%) were male and 52 (32.1%) were female doctors. The average age of these doctors was 37.89 years and the average BMI 24.99 kg/m^2. Seventy-eight (48.15%) doctors showed BMI ≥25 kg/m^2 that is, in the overweight range.

The study detected hypertension in 24 (14.82%) doctors, of which 20 of them were already on antihypertensive medication.

In this study, 98 (60.49%) doctors were found to be pre-hypertensive, that is, their BPs were in the range of SBP 120–139 mm Hg or DBP 80–89 mm Hg. They were not on any medication.

As per JNC 8 criteria, 40 (24.69%) doctors showed normal BP, that is, they showed SBP <120 mm Hg and DBP <80 mm Hg. Doctors whose BP were controlled with antihypertensive medications, were not included in this group.

Among the risk factors, which was asked during the study, 58 (35.8%) doctors showed the habit of smoking and 126 (77.78%) of the faculties (77.78%) showed a positive family history of hypertension. Although diabetes was present only in 4 doctors, almost half the number (48.15%) of the doctors showed BMI ≥25 kg/m².

Analysis was done to assess the correlation among the different risk factors for the raised BP. The mean BP of all the study subjects was calculated and the correlation between the mean BP with BMI and age calculated.

For the BMI and mean BP, Pearson's correlation coefficient was 0.163, which was significant at the 0.05 level (2-tailed).

For the age and mean BP, Pearson's correlation coefficient was 0.426, which was significant even at the 0.01 level (2-tailed).

To assess whether smoking increases the risk of raised BP or not, independent sample *t*-test was done between the smokers and nonsmokers [Table 1], and it showed with degree of freedom (*df*) = 160, *p* = 0.01 (2-tailed), and *t* = −3.466. The mean difference in BP between the two groups was −2.76 mm Hg, with a standard error of difference 0.797 [Table 2].

To assess whether positive family history increases the risk of raised BP or not, independent sample *t*-test was done between the two groups [Table 3], and it showed with df = 160, *p* = 0.044 (2-tailed), and *t* = −2.035. The mean difference in BP between the two groups was −1.91 mm Hg, with a standard error of difference 0.941 [Table 4].

Discussion

The prevalence of hypertension is increasing day by day, and doctors are also suffering from this in gradually increasing number. This is evident from our study too. In our study, a small percentage (24.69%) of doctors was found to be normotensive, whereas 14.82% of the doctors showed hypertension and a huge 60.49% of doctors showed prehypertension. This shows that the prevalences of hypertension and prehypertension are quite high in doctors also, similar to the other common people of the Indian society. This necessitates implementing lifestyle modification among doctors who show prehypertension because that is the harbinger of future hypertension.

This study also showed a significant positive correlation between the BMI and mean BP of the subjects, which supports the fact that high body weight and high BMI increases the risks of prehypertension and hypertension.

Moreover, 48.15% of the doctors showed BMI ≥25 kg/m². Increased BMI is a risk factor for not only hypertension but also diabetes mellitus, osteoarthritis, dyslipidemia, and other comorbidities. So, they should be aware enough to promote a healthy lifestyle for themselves so that they can inspire others also to reduce the body weight.

Increase in age also increases the risk of raised BP. This is also proved in this study, as there is a significant positive correlation between the age and mean BP of the subjects.

Smoking increases the risks of hypertension and pre-hypertension, as there is a very significant difference in the mean BP between the smokers and nonsmokers as revealed by independent *t*-test. This shows the importance of cessation of smoking to reduce the huge burden of prehypertension and hypertension.

Family history also influences the occurrence of prehypertension and hypertension, as there is a significant difference in the mean BP between the doctors with a positive family history of hypertension and doctors with no family history, as revealed by independent *t*-test.

Table 1: Group statistics of smoker and nonsmoker doctors and their mean BP

Nonsmoker/smoker	N	Mean BP	Standard deviation	Standard error mean	*t*
Nonsmoker	104	91.385	5.55305	0.54452	−3.466
Smoker	58	94.1479	3.27303	0.42977	

Table 2: Independent samples *t*-test for difference in average mean blood pressure among smoker and nonsmoker doctors

	Levene's test for equality of variances		*t*-test for equality of means					95% Confidence interval of the difference	
	F	Significance	T	df	Significance (2-tailed)	Mean difference	Standard error difference	Lower	Upper
Equal variances assumed	12.707	0.000	−3.466	160	0.001	−2.76293	0.79726	−4.337	−1.188
Equal variances not assumed			−3.983	159.471	<0.001	−2.76293	0.69369	−4.133	−1.393

Table 3: Group statistics of mean BP of doctors with positive and negative family history of hypertension

	Family history	N	Mean	Standard deviation	Standard error mean
Mean BP	Negative	36	91.0369	4.55816	0.75969
	Positive	126	92.9527	5.09450	0.45385

Table 4: Independent samples *t*-test for difference in average mean blood pressure among smoker and nonsmoker doctors

	Levene's test for equality of variances		*t*-Test for equality of means						
	F	Significance	t	df	Significance (2-tailed)	Mean difference	Std. error difference	95% Confidence interval of the difference	
								Lower	Upper
Equal variances assumed	0.062	0.804	−2.035	160	0.044	−1.91575	0.94153	−3.77518	−0.05632
Equal variances not assumed			−2.165	62.223	0.034	−1.91575	0.88494	−3.68460	−0.14691

This study indicates that the prevalences of prehypertension and hypertension are not at all less than the rest of the Indian population. Rather, risk factors such as raised BMI and smoking are very common among the doctors, which increase their risk of developing hypertension among the prehypertensives. Most studies from the developed countries also showed that doctors generally do not take good care of their health.[9–11] It was also demonstrated that a physician explaining one's healthy practices could be more effective in motivating the patients to follow similar practices.[12] So, proper diet, exercise, and other lifestyle measures must be promoted among them to reduce the incidence of prehypertension and hypertension among them.

Several large-scale studies are required to have a clear picture about the prevalence of prehypertension and hypertension among doctors in different parts of India.

Conclusion

This study aimed to detect the prevalence of hypertension and prehypertension among doctors of a medical college in West Bengal. It showed that a very small percentage of doctors showed a normal BP. Although the number of hypertensive doctors is less, the prevalence of prehypertension is significantly high, which would contribute in the future burden of cardiovascular disease. BMI, smoking, and family history, all impart significant influences on the prevalence of high BP.

Proper lifestyle measures must be promoted among them to reduce the incidence of prehypertension and hypertension among them.

References

1. Shetty SS, Nayak A. Prevalence of prehypertension amongst medical students in coastal Karnataka. J Evolution Med Dent Sci 2012;1(6):975–80.
2. Reddy KS. Regional case studies–India. *Nestle Nutr Workshop Ser Pediatr Program* 2009;63:15–24; discussion 41–16, 259–68.
3. Gutirrez JCS, Romero CC, Bonacho CE, Chaparro S, Sierra C, Roldan C, et al. Hypertension prevalence in health care staff and the rest of the working population. J Hypertens 2010;28 (e-Suppl A):e326.
4. Mohan V, Deepa M, Farooq S, Datta M, Deepa R. Prevalence, awareness and control of hypertension in Chennai–The Chennai Urban Rural Epidemiology Study (CURES-52). J Assoc Physicians India 2007;55:326–32.
5. Yadav S, Boddula R, Genitta G, Bhatia V, Bansal B, Kongara S, et al. Prevalence and risk factors of prehypertension and hypertension in an affluent north Indian Population. Indian J Med Res 2008;128(6):712–20.
6. Rao CR, Kamath VG, Shetty A, Kamath A. High blood pressure prevalence and significant correlates: a quantitative analysis from Coastal Karnataka, India. Int Scholarly Res Notices 2013.

7. Ramachandran A, Snehalatha C, Yamuna A, Murugesan N. High prevalence of cardiometabolic risk factors among young physicians in India. J Assoc Physicians India 2008;56:17–20.

8. Mitwalli AH, Harthi AA, Mitwalli H, Juwayed AA, Turaif NA, Mitwalli MA. Awareness, attitude, and distribution of high blood pressure among health professionals. J Saudi Heart Assoc 2013;25(1):19–24.

9. Kay MP, Mitchell GK, Del Mar CB. Doctors do not adequately look after their own physical health. Med J Aust 2004;181(7): 368–70.

10. Richards JG. The health and health practices of doctors and their families. N Z Med J 1999;112(1084):96–9.

11. Baldwin PJ, Dodd M, Wrate RM. Young doctor's health-II. Health and health behaviour. Soc Sci Med 1997;45(1):41–4.

12. Frank E, Breyan J, Elon L. Physician disclosure of healthy personal behaviors improves credibility and ability to motivate. Arch Fam Med 2000;9(3):287–90.