



Do joint national committee VII criteria also need to take non pharmacological measures into consideration? - Empirical evidence from slum resettlement colony from Delhi

Sanjeet Panesar¹, Sanjay Chaturvedi², NK Saini³, R. Avasthi⁴,
Abhishek Singh^{5*}, Pankaj Chikkara⁶

¹Senior Resident, Department of Community Medicine, Vardhman Mahavir Medical College and Safdarjung Hospital, New Delhi, India

²Professor, Department of Community Medicine, UCMS, Delhi, India

³Assistant Professor, Department of Community Medicine, UCMS, Delhi, India

⁴Professor, Department of Medicine, UCMS, Delhi, India

⁵Assistant Professor, Department of Community Medicine, SHKM Govt. Medical College, Haryana, India

⁶Assistant Professor, Department of Forensic Medicine, PGIMS, Rohtak, Haryana, India

*Corresponding author email: abhishekarleg@gmail.com

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Abstract

Background: Currently Joint National Committee (JNC) VII criteria are used worldwide to diagnose hypertension but it does not take non pharmacological measures into consideration. Also, it does not consider Indian system of medicine.

Objectives: To assess whether JNC VII in its present form is valid to diagnose hypertension correctly or revision is required especially for Indian communities where such practices are prevalent.

Material and methods: The present community based cross-sectional study was carried out in Nand Nagri, a slum resettlement of East Delhi which comes under field practice area of the Department of



Community Medicine, UCMS, Delhi from August 2010 to February 2012. Total 310 subjects aged 20-59 years were selected through multistage systematic random sample. Though the blood pressure cut-offs considered in our criteria was similar to the JNC VII cut-offs (SBP \geq 140 mmHg and or DBP \geq 90 mmHg), the difference was in the last part of JNC VII definition of hypertension i.e. treatment by anti hypertensive medicines; our criteria comprised of this statement as “any anti hypertensive measure”. Chi-square (χ^2) test was applied for analysis.

Results: Overall 54 were found to have hypertension by JNC VII criteria whereas 61 by our criteria. Seven patients who were not hypertensive by JNC VII but hypertensive by our criteria and the difference was found to be statistically highly significant ($p < 0.001$). Exercise was the most common non pharmacological measure adopted by male gender where as in females, salt restriction was the most common measure adopted.

Conclusion: Our study emphasized inclusion of non-drug therapy measures into consideration while making diagnosis of hypertension in our setup.

Key words

Treatment, Control, Non pharmacological interventions, Hypertension.

Introduction

Non-communicable diseases especially cardiovascular diseases (CVD) are major causes of death and disability in low and middle income countries [1]. Over 80% of CVD deaths occur in such countries as their populations are more exposed to risk factors, and have less access to preventive efforts [2]. By 2020, it is expected that India will have more than 50% of the CVD cases in the world. World Health Organization (WHO) has named hypertension as ‘Silent Killer’ and it has been reported as seventh contributor to premature death in developing countries [3].

Hypertension is most commonly associated with cardiovascular diseases worldwide and is the most important modifiable risk factor for cardiovascular mortality. According to WHO, each year at least 7.1 million people die as a result of hypertension [3]. Despite the high prevalence; prevention, detection, treatment, and control of hypertension is suboptimal and unsatisfactory in developing countries like India [4].

It is established fact that non pharmacological measures also have significant role in treatment and control of hypertension. Currently JNC VII criteria are used worldwide to diagnose hypertension but it does not take non pharmacological measures into consideration. Also, it does not consider Indian system of medicine. Therefore it becomes essential to assess whether JNC VII in its present form is valid to diagnose hypertension correctly or revision is required especially for Indian communities where such practices are prevalent.

Material and methods

The present community based cross-sectional study was carried out in Nand Nagri, a slum resettlement of East Delhi which comes under field practice area of the Department of Community Medicine, University College of Medical Sciences (UCMS), Delhi from August 2010 to February 2012. It has a population of over 50,000 and mostly falling in the category of low socio-economic status.



The sample size was calculated with anticipated prevalence of hypertension as 27.5% [5], 5% Absolute precision, 95% Confidence Interval and 10% non response error, as 310 adults over the age of 20 years. The study subjects were selected through multistage systematic random sampling technique. One sub block was randomly selected from each of the five blocks of the study area. Sampling unit was a household; a household was randomly selected from first 20 households (sampling interval for 5%). Thereafter, starting from that household, every 20th household was selected. All the 20-59 years subjects, residing in the selected household for 6 months or more, were included in the study. If there were no eligible subject in the selected household or the house was closed for 3 consecutive visits, it was replaced by a contiguous household without disturbing the allocation of next 20th sampling unit.

Blood pressure of all the subjects was measured according to JNC VII / American Heart Association (AHA) recommendations. JNC guidelines [6, 7] were followed for defining awareness, treatment and control of hypertension. Among the hypertensive's, subjects with prior diagnosis of hypertension/high BP were considered as 'aware'; those with current anti hypertensive drug therapy as 'treated'; and subjects showing SBP <140 mmHg, DBP <90 mmHg, and taking anti hypertensive medication as 'controlled'. Though the blood pressure cut-offs considered in our criteria was similar to the JNC VII cut-offs (SBP \geq 140 mmHg and or DBP \geq 90 mmHg), the difference was in the last part of JNC VII definition of hypertension i.e. treatment by anti hypertensive medicines; our criteria comprised of this statement as "any anti hypertensive measure"; these measures taken include anti hypertensive drugs (which could be allopathic, ayurvedic, homeopathic, unani, siddha, herbal medicine, indigenous medicines), non pharmacologic measures like

weight reduction, exercise, salt restriction, smoking cessation, reduction in alcohol intake, stress management, yoga, meditation, etc.

In depth enquiry was made regarding afore mentioned non-pharmacological anti hypertensive measures taken by them. Relevant socio-demographic data of the individuals was also recorded. Ethical committee approved the study. Informed consent was obtained from the study participants.

The collected data was coded and entered in Statistical Package for Social Sciences (SPSS), version 20. The results were expressed as proportions. Chi-square (χ^2) test was applied to test the difference across the groups and $p < 0.05$ was considered statistically significant.

Results

The comparison made between JNC VII and our criteria to diagnose the hypertension among 310 subjects as per **Table - 1**. Overall 54 were found to have hypertension by JNC VII criteria whereas 61 by our criteria. Seven patients who were not hypertensive by JNC VII but hypertensive by our criteria and the difference were found to be statistically highly significant. ($p < 0.001$)

Proportion of aware subjects who controlled their blood pressure by adopting one or more non pharmacologic measure or life style was calculated. According to it, 8 subjects adopted non pharmacologic medication to control their BP of which 7 subjects were able to achieve BP control. All the 8 subjects who used non pharmacologic measures were having Grade 1 hypertension as per **Table - 2**.

The most common non pharmacological measure adopted by the subjects was salt restriction in diet (87.5%), among males most common measure was exercise (100%) where as



in females salt restriction was the most common measure adopted (100%). Any other system of medicine other than allopathic system was not used by study subjects as per **Table - 3**.

Discussion

The successive reports of the Joint National Committee on prevention, detection, evaluation and treatment of high blood pressure (HBP), non drug therapy is recommended as it has long been considered efficacious [8]. In addition, reports on primary prevention of HBP including the primary prevention of essential hypertension (report of a WHO scientific group) [9] and National High Blood Pressure Education Program's (NHBPEP) working groups report on primary prevention of hypertension [10], have stressed on the non drug therapy.

The JNC VII criteria to diagnose hypertension were put forth way back in 2003. In the present study, we observed that 54 were diagnosed to have hypertension by JNC VII criteria where as 61 by our criteria in a study of mere 310 subjects. Difference between JNC VII and our criteria was in the last part of JNC VII definition of hypertension i.e. treatment by anti hypertensive medicines; our criteria comprised of this statement as "any anti hypertensive measure." Seven patients were non hypertensive by JNC VII but diagnosed to have hypertension by our criteria. Issue would look more relevant and serious when this aspect is applied to the bigger population of our communities where they practice non pharmacologic measures to live healthy. It can be said that we are underestimating the actual burden of hypertension. How policies can be made to manage a public health problem without knowing its actual magnitude!

It was observed in our study that out of 8 subjects who adopted non pharmacologic

medication to control their BP, 7 of them had practiced 'Salt restriction'. Cutler, et al. [11] in their analysis of 23 randomly controlled trials showed that 100 mmol/day reduction in sodium intake was associated with a decline of 5.7 mmHg SBP and 2.7 mmHg DBP in hypertensive subjects and 2.2 mmHg/1.3 mmHg in normotensives. Others also observed the similar findings [8, 12].

Physical activity in the form of exercise was adopted by 5 individuals in our study. Today, physical exercise is considered as an important component of the non drug treatment of hypertension. Physically active persons have lower blood pressure, reduced risk for cardiovascular and all cause mortality and live longer. The benefit of physical activity to the primary prevention of hypertension has been documented by both clinical trials and longitudinal studies [13, 14, 15].

Smoking independently raises BP, although epidemiologically the relationship between smoking and hypertension is often confounded by other factors such as alcohol consumption and lower consumption of fruits and vegetables (anti-oxidants) amongst smokers than non-smokers [8].

JNC VI report [16] found no support for the use of relaxation techniques for the prevention of hypertension. Yoga, meditation (mind-body techniques) are widely practiced for stress reduction in India. In our study also 3 subjects adopted such techniques to reduce their blood pressure. BP lowering effect of transcendental meditation has been further supported by two meta-analyses; each suggesting TM can reduce both SBP and DBP.

Several clinical studies Viz. Framingham off-spring study [19], INTERSALT study [20], TOPH-I, II [21, 22] have shown direct benefit of weight



reduction on hypertension. During weight loss, a rapid reduction in BP is seen over 8-10 weeks. There seems to be a linear relationship between weight and blood pressure. The BP falls as there is reduction of weight. With reduction of weight, one can reduce or even stop the medications [23].

Conclusion

To conclude, we have accumulated knowledge and empirical evidences over decades of research but made poor use of them. Our study emphasized inclusion of non drug therapy measures into consideration while making diagnosis of hypertension in our setup. Large scale studies are recommended to support our findings.

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Table - 1: Comparison of our criteria to define hypertension with respect to JNC criteria.

By our criteria	By JNC criteria		Total (%)	p-value
	Hypertensive (%)	Non Hypertensive (%)		
Hypertensive	54 (88.5)	7 (11.5)	61 (19.7)	<0.0001*
Not hypertensive	0 (0.00)	249 (100)	249 (80.3)	
Total	54 (17.4)	256 (82.6)	310 (100)	

*p<0.001, Highly significant

Table - 2: Type of therapy taken by total aware subjects.

Anti hypertensive treatment	Total aware subjects	Controlled (%)	Uncontrolled (%)
Pharmacologic medications	21 (61.8)	10 (47.6)	11 (52.4)
≥ 1 Non pharmacologic measures	8 (38.2)	7 (87.5)	1 (12.5)
Figures in parenthesis indicate percentage.			

Table - 3: Distribution of various types of non pharmacologic interventions according to gender.

Classification of non pharmacologic measures adopted by subjects	Males (n=3)		Females (n=5)		Total (n=8)	
	No.	%	No.	%	No.	%
Weight reduction	1	33.3	0	0	1	12.5
Exercise	3	100	2	40	5	62.5
Salt restriction	2	66.7	5	100	7	87.5
Smoking cessation	0	0	0	0	0	0
Ayurvedic, Homeopathic, Unani, Siddha, Herbal medicine, Indigenous medicines	0	0	0	0	0	0
Reduction of salt intake	1	33.3	0	0	1	12.5
Stress management/ yoga, etc.	2	66.7	1	20	3	37.5

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