

ORIGINAL RESEARCH

## To Study the Influence of Initial and Subsequent Motivation on Control of Hypertension and its Risk Factors

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### ABSTRACT

**Context:** Hypertension (HTN) is highly prevalent in India and increasing trends of HTN is a world-wide phenomenon. Despite high prevalence of HTN, unfortunately awareness, treatment and control rates are very low. Adequate control of HTN is achieved only in about 10% of the hypertensives in India which is less than a half of that in the West. This data stimulated us to study the influence of initial and subsequent motivation in control of HTN and its risk factors in Punjab.

**Methods:** We conducted a randomised controlled study in 735 patients of HTN (who completed the study). They were randomly divided into, Group I of 365 patients were motivated at the start of the study (initial motivation) and Group II of 370 patients were educated and motivated at the start and every month of their visit to the hospital for 6 months (subsequent motivation), the duration of the study. Education and motivation included interaction with patients, the printed and audio-visual information about HTN, complication, drug treatment and importance of lifestyle modification on the course of disease. **Results:** In our study we achieved adequate control of blood pressure (BP) in 67.7% of initial motivation group and 90.4% of subsequent motivation group. Normal BP levels were achieved in 55.9% of initial motivation group and 70.4% of subsequent motivation group. All the risk factors showed improvement in motivation groups more so in subsequent motivation group. **Conclusion:** We conclude that education and motivation play a major role in improving compliance, the control rate of HTN and the associated risk factors especially when patient is motivated and educated on subsequent visits also.

**Keywords:** Hypertension, Motivation, Control, Risk factors, Health education, cardiovascular diseases, Blood pressure

### INTRODUCTION

Hypertension (HTN) is an important modifiable risk factor for cardiovascular, cerebrovascular and renal morbidity and mortality. The number of cardiovascular diseases is fast increasing in the developing world<sup>[1]</sup>. The World Health Organization (WHO) has estimated that about 62% of cerebrovascular disease and 49% of ischemic heart disease burden worldwide are attributable to suboptimal blood pressure (BP) levels (systolic blood pressure, SBP >115 mmHg), an observation consistent across groups defined by sex,

age, and ethnicity. High BP is estimated to cause 7.1 million deaths annually accounting for 13% of all deaths globally. It is a component of risk-factor cluster and hence markers of presence of future development of other cardiovascular risk factors<sup>[2]</sup>. Hypertension is highly prevalent in India and increasing trends of HTN is a world-wide phenomenon. The prevalence of HTN is reported to be increasing rapidly in the urban India, and the same trend is spreading gradually to rural areas. The prevalence of HTN in India has been reported to vary regionally. Meta analysis of

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several epidemiological studies suggests that HTN is present in 25% of adults in the urban India, and in 10% of individuals in the rural India. The same meta analysis estimated that there were about 66 million hypertensives in India (32 million rural and 34 million urban)<sup>[3]</sup>. The data indicate that a quarter of adult population has established HTN and about twice that number has pre-hypertension. Despite high prevalence of HTN, unfortunately awareness, treatment and control rates are very low. Adequate control of HTN is achieved only in about 10% of the hypertensives in India<sup>[4-6]</sup>. The control rate of HTN in India is less than a half of that in the West<sup>[1]</sup>. According to 7th JNC Report adequate control of BP was defined as BP <140/90 mmHg and normal BP as <120/80 mmHg. 7th JNC report shows only 34% control rate of HTN. It also stresses on the role of motivation. In a recent Indian study adequate BP control was noted only in 6.4% of hypertensives<sup>[3]</sup>. The treatment of HTN has been one of medicine's major successes of the past half-century. The remarkable advances in therapy have provided the newfound capability for lowering BP in almost every person with HTN. Nevertheless, HTN continues to be a major public health problem whose prevalence is increasing worldwide<sup>[1]</sup>. Moreover, the number of people with uncontrolled BP is also increasing, despite the therapeutic advances<sup>[7]</sup>. This data stimulated us to study the influence of initial and subsequent motivation in control of HTN and its risk factors like BMI, waist to hip ratio, smoking, alcohol and exercise in Punjab.

## METHODS

We conducted a randomised controlled study in 735 patients of HTN (who completed the study) above the age of 18 years. They were randomly divided into two groups, Group I of 365 patients were motivated at the start of the study (initial motivation) and Group II of 370 patients were educated and motivated at the start and every month of their visit to the hospital for 6 months (subsequent motivation), the duration of the study. 15 to 20 min of education and motivation sessions were conducted by the

consultant in group or individually which included interaction with patients, the printed and audio-visual information about HTN, complication, drug treatment and importance of lifestyle modification on the course of disease.

## Measurement of Blood Pressure

BP was measured by the doctor using the standard technique. Standardised mercury sphygmomanometers with appropriate cuff sizes on the basis of arm circumference of the participants were used. Before BP measurement, it was made sure that the subjects had not consumed either tea or coffee, smoked or exercised vigorously in the last 30 min. BP was measured in the sitting position on the upper arm with the arm supported and sphygmomanometer at the level of the heart. The cuff was inflated 20–30 mmHg above the level and the cuff was deflated at a rate of about 2 mmHg/s. Phase 1 and phase 5 of the Korotkoff sound were taken as indicative of the systolic and diastolic pressures, respectively. The average values of two consecutive BP readings were taken.

## Definitions

**Hypertension:** A subject was considered hypertensive if one had an average SBP > 140 mmHg or diastolic blood pressure (DBP) >90 mmHg, with or without antihypertensive medication. The diagnosis and classification of HTN was done according to the JNC-VII report. Normal SBP <120 mmHg and DBP <90 mmHg, Pre hypertension SBP 120–139 mmHg and DBP 80–89 mmHg, Stage I HTN SBP 140–159 mmHg and DBP 90–99 mmHg and Stage 2 HTN SBP >160 mmHg and DBP >100 mmHg.

**Control of Blood Pressure:** According to JNC-VII, adequate control of HTN was defined as SBP <140 mmHg and DBP <90 mmHg and normal BP was defined as SBP <120 mmHg and DBP <80 mmHg with or without antihypertensive treatment.

Waist-to-hip ratio of >0.9 and >0.8 were taken as cutoff for central obesity in men and women, respectively.

BMI was calculated using the formula: weight (kg)/height (m) square and was categorised as underweight <18.5, normal 18.6–24.9, overweight 25–29.9 and obese >30.

Physical activity was categorised as sedentary, moderate and strenuous according to daily life style and exercise schedule.

Smoking at least one cigarette per day for the past six months was considered as smoker and all others were classified as nonsmokers.

Alcohol consumption of 60 to 90 ml twice a week was considered to be taking alcohol.

## RESULTS AND OBSERVATIONS

Total number of 735 patients (who completed the study) were randomly divided into two groups Group I of 365 patients including 187 males and 178 females and Group II of 370 patients including 189 males and 181 females. Group I patients underwent initial motivation (IM) and education sessions only at the start of the study and Group II patients underwent initial and subsequent motivation (SM) and education sessions at the start of the study and at every month of their visit to the hospital for follow up for six months. In Group I at the start of the study 52.3% (191) patients had stage I HTN and 47.7% (174) had stage II HTN and at the end of the study normal BP was achieved in 55.9% (178), adequate control or pre hypertension levels in 11.8% (43) and 12.6% (46) and 26.7% (98) remained in stage I and stage 2 HTN respectively. In Group II, at the start of the study, 55.9% (207) patients had stage I HTN and 44.1% (163) had stage II HTN and at the end of the study normal BP was achieved in 70.4% (261), adequate control or pre hypertension levels in 20.0% (74) and 5.7% (21) and 3.9% (14) remained in stage I and stage 2 HTN respectively. In our study we achieved adequate control of BP (<140/90) in 67.7% of initial motivation group and 90.4% of subsequent motivation group. Normal BP levels (<120/80) were achieved in 55.9% of initial motivation group and 70.4% of subsequent motivation group. All the risk

factors body mass index, waist hip ratio, smoking, lack of exercises and alcohol intake showed improvement in motivation groups more so in subsequent motivation group as shown in Table 1.

## DISCUSSION

In our study, we achieved adequate control of BP (<140/90) in 67.7% of initial motivation group and 90.4% of subsequent motivation group. Normal BP levels (<120/80) were achieved in 55.9% of initial motivation group and 70.4% of subsequent motivation group. All the risk factors showed improvement in motivation groups more so in subsequent motivation group. These figures suggest the urgent need for education and motivation at community level to increase awareness and health facilities for better treatment and control of HTN. The awareness about and control of HTN are not considered satisfactory in other parts of the world. According to the National Health survey of Pakistan, 70% of the hypertensive patients were unaware of their disease<sup>[8]</sup>.

In an Indian study, only 41.1% of the hypertensive subjects were aware that they had HTN. About 74% of the hypertensive subjects did not receive any kind of treatment, 19.2% received drug treatment, and only 6% of the total hypertensive subjects (36% of the treated ones) had good control of BP<sup>[4]</sup>. In a study carried out in Kerala, India, only 39% of the hypertensive individuals were aware of their condition, only 29% were treated with antihypertensive drugs, and only 30.6% of the treated subjects had adequate control of BP<sup>[3]</sup>. In a Chinese study only 44.7% patients were aware of their problem, 28% taking anti-hypertensive medication and only 8.1% of the hypertensive patients achieving good control of BP<sup>[9]</sup>.

According to the JNC-VII report, the situation in US has improved significantly with the awareness of HTN from a level of 51–70% in the last 20 years. The percentage of hypertensive patients receiving treatment improved from 31% to 59% in the same period and the percentage of patients with controlled HTN to <140/90 mmHg has increased from 10% to

**Table 1: Influence of initial and subsequent motivation on control of hypertension and its risk factors**

Indicators	% (N)			
	Group (I) Initial motivation (N-365)		Group (II) Subsequent motivation (N-370)	
	Start	End	Start	End
<b>Male:female</b>	187:178	187:178	189:181	189:181
<b>Blood pressure</b>				
>160/100 mmHg	47.4 (174)	26.7 (98)	44.1 (163)	3.9 (14)
140-159/90-99	52.3 (191)	12.6 (46)	55.9 (207)	5.7 (21)
130-139/80-89	0.00 (0)	11.8 (43)	0.00 (0)	20.0 (74)
<130/80 mmHg	0.00 (0)	55.9 (178)	0.00 (0)	70.4 (261)
<b>Body mass index</b>				
<18.5	23.1 (84)	23.8 (87)	21.9(81)	24.9 (92)
18.5-24.9	47.3 (173)	51.5 (188)	47.1(174)	55.4 (205)
25-29.9	17.8 (65)	14.5 (53)	16.7(62)	10.5 (39)
>30	11.8 (43)	10.2 (37)	14.3(53)	9.2 (34)
<b>Waist-Hip ratio</b>				
Males: >0.9	31.1 (58)	27.3 (51)	32.3 (61)	24.3 (46)
Males: <0.9	68.9 (129)	72.7 (136)	67.7 (128)	75.7 (143)
Females: >0.8	45.5 (81)	40.4 (72)	43.1 (78)	33.7 (61)
Females: <0.8	54.5 (97)	59.6 (106)	56.9 (103)	66.3 (120)
<b>Exercise</b>				
Sedentary	72.3 (264)	63.3 (231)	70.0 (259)	48.1 (178)
Moderate	23.0 (84)	30.9 (113)	23.5 (87)	42.2 (156)
Strenuous	4.7 (17)	5.8 (21)	6.5 (24)	9.7 (36)
Smoking	15.9 (58)	14.7 (54)	18.1 (67)	14.3 (53)
Alcohol	21.6 (79)	19.2 (70)	22.7 (84)	13.8 (51)

34%. However, in Europe where the prevalence of HTN is much higher, only 8% of hypertensive patients had good control of BP<sup>[10]</sup>. Results of our study suggest that education and motivation can play an important role in control of HTN especially when patient is educated and motivated on subsequent visits also. Education and motivation not only control the HTN but are significantly improving the risk factor profile of the patient. It is time for the developing and less developed countries to realise that the prevention of cardiovascular diseases should also receive as much attention as that of nutritional and communicable diseases. There is a strong need for widespread health education program for prevention of cardiovascular diseases in the general population as well as development of a mechanism to detect

and control HTN and other cardiovascular risk factors at the primary health-care level. Controlling blood pressure should be our national priority as untreated HTN leads to increased CVS, cerebrovascular and renal mortality and morbidity. Health policy should be designed to stress on increasing the awareness level of population. Health professionals, workers and NGOs should educate and motivate community regarding benefits of life style modifications and adequate control of HTN along with the risk factors to avert an impending epidemic of cardiovascular diseases.

## CONCLUSION

We achieved adequate control of BP in 67.7% of

initial motivation group and 90.4% of subsequent motivation group. Normal BP levels were achieved in 55.9% of initial motivation group and 70.4% of subsequent motivation group. All the risk factors showed improvement in motivation groups more so in subsequent motivation group. We conclude that education and motivation play a major role in improving compliance, the control rate of HTN and the associated risk factors especially when patient is motivated and educated on subsequent visits also. This part is often neglected by the consultants. The findings of this study may be taken into consideration while determining future health priorities in the country. There is a strong need for wide spread health education and motivation programme for prevention of cardiovascular diseases in general population to detect and control HTN and other cardiovascular risk factors at primary health care levels.

## REFERENCES

1. Reddy KS, Yusuf S. Emerging epidemic of cardiovascular disease in developing countries. *Circulation* 1998;97:596–601.
2. World Health Organization. Reducing risks, promoting healthy life. The World Health Report 2002. Geneva: WHO 2002.
3. Gupta R. Trends in hypertension epidemiology in India. *J Hum Hypertension* 2004;18:73–8.
4. Thankappan KR, Sivasankaran S, Khader SA, Sarma PS, Mini GK, Vasan RS. Prevalence, correlates, awareness, treatment and control of hypertension in Kumarakom, Kerala: baseline results of a community-based intervention program. *Indian Heart J* 2006;58:28–33.
5. Sharma D, Man BKC, Rajbhandari S, Raut R, Baidya SG, Kafle PM, *et al.* Study of prevalence, awareness and control of hypertension in a suburban area of Kathmandu, Nepal. *Indian Heart J* 2006;58:34–37.
6. Hypertension Study Group. Prevalence, awareness, treatment and control of hypertension among the elderly in Bangladesh and India: a multicentre study. *Bull World Health Organ.* 2001; 79(6): 490–500.
7. Kearney PM, Whelton M, Reynolds K, Muntner P, Whelton PK, He J. Global burden of hypertension: analysis of worldwide data. *Lancet* 2005;365:217–23.
8. Health profile of the people of Pakistan. Pakistan Medical Research Council. Islamabad network publication service, 1998.
9. Gu D, Reynolds K, Wu X, Chen J, Duan X, Muntner P, *et al.* InterASIA Collaborative Group. The International Collaborative Study of Cardiovascular Disease in ASIA. Prevalence awareness, treatment and control of hypertension in China. *Hypertension* 2002;40:920.
10. Wolf MK, Cooper RS, Banegas JR. Hypertension prevalence and blood pressure levels in 6 European countries, Canada and the United States. *JAMA* 2003;289:2363–9.

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