MANAGEMENT OF HYPERTENSION IN RURAL AREA OF NORTH-EASTERN REGION OF THE MAHARASHTRA: A INTERVENTIONAL STUDY

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ABSTRACT--*Hypertension being major chronic and non-communicable, leads to heart failure, coronary artery disease, stroke, impairment of kidney function, disability, and early death. Lifestyle behaviours such as unhealthy diet, increased salt intake, physical inactivity, use of tobacco and alcohol abuse are principal risk factor which leads to development of hypertension.Study was randomised, community-based health and knowledge trial was conducted in rural area around ABV rural hospital, Wardha. The study was approved by research and ethics board of DMIMISU Sawangi Meghe.In present study total 180 patients agreed to participate they were divided into 3 groups randomly. Following steps were taken to avoid selection bias during random allocation. Group was randomised only after baseline survey; An epidemiologist who was not in contact with study randomised the groups. Group 1 (self-reading and learning, n=60) participants received orientation on reading materials to learn knowledge on hypertension through the poster, messages and pamphlet and health education booklets monthly. Group 2 (training and health education, n=60) participated in training and health education, health education consisted of 30 min lecture per month. Group 3(interactive education workshop, n=60) workshop on knowledge about hypertension was given using visual health education (cartoons, animals, food models, salt spoons, and CVD models)At the baseline, most participants (about 2/3) did not regularly take BP lowering medications. After the 12monts of health education intervention, there were statistically significant increases in hypertension-related knowledge scores in all the three intervention groups. However, the increase was significantly greater in the interactive education workshop group 3 (mean score increased from 3.1 to 7.9) than in the regular lecture group 2 (mean score increased from 3.1 to 6.9) or self-learning reading group 1 (mean score increased from 3.9 to 6.1). Regular use of medications for hypertension and regular physical activity were significantly more frequent after the intervention in all the three groups, but the improvements were progressively greater from group 1 to group 2 to Group 3. There were no significant differences in smoking and alcohol use at both the baseline or after the intervention among the three groups.In end, interactive education workshops possibly will be the most effective approach in community-based health education programs for hypertensive patients in improving patients' knowledge on hypertension and lessening clinical risk factors for inhibiting hypertension-related problems.*

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I.   INTRODUCTION

Hypertension has been identified as a leading risk factor causing death globally.[1] Management of hypertension decrease risk factor, but less than one third of population with hypertension have controlled blood pressure.[2,3,4] In rural areas, in low and middle income countries where system lacks to provide proper knowledge regarding health and health facilities, uncontrolled blood pressure is particularly predominant.[5,6]

Hypertension being major chronic and non-communicable, leads to heart failure, coronary artery disease, stroke, impairment of kidney function, disability, and early death .[7] Lifestyle behaviours such as unhealthy diet, increased salt intake, physical inactivity, use of tobacco and alcohol abuse are principal risk factor which leads to development of hypertension.[8]

Estimated prevalence of hypertension in Maharashtra is nearly around 25%, it is higher amongst elder, cigarette smokers, alcohol consumers and obese persons.[9] Target of intervention was to reduce hypertension, control blood pressure, improve quality of life by reducing complications and mortality in rural population of nearby villages.

Health education may act as a key to improve the hypertension, by providing proper knowledge about disease and its therapy. Although no clear health education strategy has been developed, this works best in improving health, knowledge and possible outcome of these practices in uncontrolled blood pressure.[10]
Lay mans and persons with low education level find difficult to understand health education or finding it boring or ineffective.[11]

Thus, the aim of this study protocol is to determine the effect of family-based home health education and screening of blood pressure in adults by trained and qualified health worker in rural areas of wardha.

We have recognized absences in various numbers of previous studies, such as contagion bias. For example, demonstration projects were carried out without any control group, lack of health workers. there has been a lack of detail about health workers.[12] Restricting in use of dietary salt in sub Saharan Africa results to decrease in level of blood pressure.[13] Small but significant differences was seen in study conducted in Pakistan. [14]

Although there is lack of evidences on effective practices for health worker involved in management of hypertension in normotensive, pre-hypertensive and hypertensive groups. Therefore advantage of present study is hypothesized to provide an accurate prevalence rate and risk factors for hypertension, and also to design intervention in management of hypertension in rural area.

However, there is still a lack of evidence on effective protocols for community health worker population approaches to reducing blood pressure in normotensive, pre-hypertensive, and hypertensive groups. Hence, a advantage of the present study was to provide an accurate prevalence rate and risk factors for hypertension, and also to design an intervention for hypertension management at the community level, by assessing the changes in hypertension – related knowledge, anti-hypertensive medication and lifestyle.

II.   MATERIAL AND METHOD

Study was randomised, community-based health and knowledge trial was conducted in rural area around ABV rural hospital, Wardha. The study was approved by research and ethics committee of DMIMISU Sawangi Meghe.

Informed consent was obtained from all participants. The survey tool introduced was adapted from the World Health Organization (WHO) STEP wise approach to surveillance [15], which includes physical measurement (height, weight), socio-demographic information (e.g., age, sex, family size, occupation, income, education), lifestyle factors (e.g., salt consumption, smoking, alcohol, physical activity), and blood pressure measurement. Among eligible participant normotensive, pre-hypertensive and hypertensive participant was identified and asked to participate.

III. PARTICIPANTS AND INTERVENTION

Patients were recruited among patient managed at ABV Rural Hospital, Sawangi, Meghe, Salod Village and melghat Amravati. Patients with following inclusion criteria were included: a clinical diagnosis of hypertension, consciously well, age group 40-75, completed primary school atleast, those who were able to communicate with our health professional individuals. Those who met any one of the following exclusion criteria were excluded: pregnancy, mental disorder, other serious disorders, AIDS, Kidney disease etc.

In present study total 180 patients agreed to participate they were divided into 3 groups randomly. Following steps were taken to avoid selection bias during random allocation. 1).Group was randomised only after baseline survey; 2) . an epidemiologist who was not in contact with study randomised the groups.

Group 1 (self-reading and learning, n=60) participants received orientation on reading materials to learn knowledge on hypertension through the poster, messages and pamphlet and health education booklets monthly. Group 2 (training and health education, n=60) participated in training and health education, health education consisted of 30 min lecture per month. Group 3(interactive education workshop, n=60) workshop on knowledge about hypertension was given using visual health education (cartoons, animals, food models, salt spoons, and CVD models)

Baseline assessment (n=)		
	Recruited for study(n=180)	
	Randomisation	
	INTERVENTION	
Self-reading and learning • Total participants (n=60)	Training and health education • Total participants (n=60)	Interactive workshop • Total participants (n=60)

	12 months follow up	
	• Complete assessment (n=180)	

Figure 1: Planned flow of participant

IV. ASSESSMENTS OF INTERVENTION EFFECTS

The primary outcome of study was reduction in mean SBP after 12 months of health education intervention. Other outcome of study was reduction in DBP, change in blood pressure related knowledge, lifestyle, anthropometric and biochemical (serum lipids) parameters.

Knowledge related to hypertension was assessed based on participants' responses to questionnaire made by healthcare individuals. Self-reported regular use of medications for hypertension, dose and number of BP lowering drugs prescribed by practitioners. Lifestyle modifications were assessed on self-reported physical exercise, smoking and drinking history and salt intake in food, in accordance to Chinese guidelines.[16]

V. DATA ANALYSIS

The trial's principal outcome (BP) was evaluated by the consultants in who were unknown to the intervention group, and data were recorded in EXCEL. SPSS 13.0 was used to analyse the data. To compare the data before and after interventions paired t-test was introduced.

VI. RESULTS

Characteristics: Statistically there were no significant differences among three groups. Women were more in number as compared to men. 70% of population were less educated.

Effect of Health education on hypertension, to medications and lifestyle

Baseline and post-intervention hypertension knowledge score, antihypertensive medications and lifestyle variables in hypertensive patients by mode of health education on hypertension (Group 1, reading n=60; Group 2, regular lecture n=60; Group 3, interactive workshop, n=60)

Group	Baseline	Post intervention	p
Hypertension knowledge score			
1	3.9± 1.3	6.1± 1.7	<0.001
2	3.1±2.0	6.9±1.6	<0.001
3	3.1±1.9	7.9±1.6	<0.001
Taking medicine on regular basis			
1	49(41.9)	63(49.8)	<0.001

2	33(29.5)	87(76.9)	<0.001
3	39(33.6)	109(93.2)	<0.001
Salt intake in food			
1	92 (79.7)	100(82.3)	0.002
2	73 (66.4)	98 (81.5)	<0.001
3	75 (70.5)	109 (94.3)	<0.001
Physical exercise			
1	30 (27.1)	58 (47.8)	<0.001
2	28 (21.9)	79 (66.7)	<0.001
3	33 (29.8)	99 (82.9)	<0.001
Current smokers			
1	25 (19.9)	19 (15.7)	0.068
2	22 (19.5)	18 (15.0)	0.129
3	22 (18.2)	21 (19.4)	1.000
Current alcohol consumers			
1	9 (8.5)	8 (7.6)	1.000
2	6 (5.4)	5 (4.7)	1.000
3	11 (9.5)	10 (8.9)	1.000

Data presented are mean ± SDP values in paired t-test

At the baseline, most participants (about 2/3) did not regularly take BP lowering medications. After the 12monts of health education intervention, there were statistically significant increases in hypertension-related knowledge scores in all the three intervention groups. However, the increase was significantly greater in the interactive education workshop group 3 (mean score increased from 3.1 to 7.9) than in the regular lecture group 2 (mean score increased from 3.1 to 6.9) or self-learning reading group 1 (mean score increased from 3.9 to 6.1). Regular use of medications for hypertension and regular physical activity were significantly more frequent after the intervention in all the three groups, but the improvements were progressively greater from group 1 to group 2 to Group 3. There were no significant differences in smoking and alcohol use at both the baseline or after the intervention among the three groups.

The effect of health education on anthropometric, clinical and biochemical parameter.

Baseline and post-intervention hypertension knowledge score, antihypertensive medications and lifestyle variables in hypertensive patients by mode of health education on hypertension (Group 1, reading n=60; Group 2, training and health education n=60; Group 3, interactive workshop, n=60).

Group	Baseline	Post intervention	P

Normalised			
1	43 (38.9)	49 (434.1)	0.461
2	46 (40.2)	74 (65.2)	<0.001
3	41 (44.2)	103 (85.3)	<0.001
Systolic BP, mmHg			
1	142.2±18.9	140.4±17.7	0.611
2	144.9±16.2	133.8±15.9	<0.001
3	147.7±21.5	131.7±13.6	<0.001
Diastolic BP, mmHg			
1	88.7±11.2	87.2±10.66	0.176
2	90.8±10.7	85.4±11.2	<0.001
3	90.7±16.5	83.2±8.0	<0.001
BMI			
1	27.2±4.0	25.0±4.1	<0.001
2	27.6±3.5	27.5±2.9	0.363
3	26.2±3.7	24.1±3.7	<0.001
Waist circumference			
1	88.1±12.1	87.0±9.5	0.207
2	88.9±8.8	88.8±8.5	0.488
3	90.3±8.7	88.7±8.2	<0.001
Triglycerides, mg/dL			
1	210.9±70.6	176.6±68.8	<0.001
2	140.4±63.4	141.3±49.4	0.871
3	155.7±71.5	150.9±83.0	0.658
Total Cholesterol, mg/dL			
1	199.7±101.5	193.2±83.8	0.154
2	208.7±71.3	195.6±35.9	0.01
3	210.8±43.3	199.8±40.1	<0.001
LDL-cholesterol, mg/dL			
1	101.5±34.7	104.7±34.9	0.019
2	104.9±31.5	105.6±22.9	0.808
3	105.1±28.7	99.3±29.1	<0.001
HDL-cholesterol, mg/dL			
1	40.0±7.4	42.0±9.2	0.007
2	43.6±7.9	44.7±11.7	0.36

3	38.8±8.8	40.2±8.7	0.033

Data presented are mean ± SDP values in paired t-test

Decrease in BMI was significant in both group 1 and group3, but not in group 2.

Patient in group 1 had largest decrease in BMI after intervention.

Both systolic and diastolic BP was reduced in significant manner after intervention in group 2 and 3.

Post intervention, fasting serum triglycerides concentrations were higher in group 1 as compared to 2 and 3. After intervention serum total cholesterol decreased significantly in group 2 and 3 but no changes was seen in group 1. LDL cholesterol increased in group 1, unchanged in group 2 and decreased in group 3 after intervention. After the 12 month interventions on health and knowledge, positive outcome were observed in hypertension related knowledge scores were good, physical health activity, use of medications, and appropriate salt intake in food among all three groups. Positive and improved result was seen progressively greater from group 1 to group 2 to group 3. The result established an beneficial intervention in health education approach in progression of controlling high blood pressure.

Various reports have revealed that educational interventions on disease-related knowledge may help patients to better understand their health problem and its therapy leading to advantageous changes in health behaviours and obedience to regular treatment in improving health outcomes [17]. Present study confirmed this finding. In addition, present study also found that an collaborative participatory health education approach works best, as established by the most significant improvements in hypertension-related knowledge, and the largest reductions in body mass index, BP, and serum LDL levels. In general, the improvements in clinical risk factors (e.g. LDL) were the best in the interactive education workshop group. We are conscious of only one fresh trial on health education in the managing hypertension: Ribeiro et al. compared monthly health education workshops alone to monthly education workshops combined with family co-ordination from end to end home visits, and found the latter strategy was associated much better changes in obedience to treatment and reductions in behavioural and clinical risk limitations. Taking together, it appears that health educational interventions could be an important tool for improving clinical outcomes in hypertensive patients.

We detected no significant alterations in the quantities of smokers and alcohol abusers in all the three health education intervention groups. One promising clarification is that most smokers were nicotine-dependence, thus it is very tough to leave smoking. In the same way, alcohol abusers might be alcoholic and difficult to withdraw. Numerous reports in China have exposed that nicotine or alcohol addiction is supplementary with middle age, low education and low income[18]which are the characteristics of the present study inhabitants.

In a systematic review (Glynn LG 2010) [19] education interventions directed at the patients showed no net large reductions in blood pressure. In this evaluation, several RCTs (Hennessy 2006, Hunt 2004, McKinstry 2006, Watkins 1987)[20-21] assessed education interventions by dispatched educational materials (such as booklets) similar to the intervention Group 1 in our study, and they testified no effect or at best a relatively modest effect on hypertension control. Present study spread out those observations in demonstrating that interactive education workshops are as more helpful in BP control as self-learning education.

VII.   CONCLUSION

In end, interactive education workshops possibly will be the most effective approach in community-based health education programs for hypertensive patients in improving patients' knowledge on hypertension and lessening clinical risk factors for inhibiting hypertension-related problems.

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Conflicts of interest:

There are no conflicts of interest.

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