

ADHERENCE TO HYPERTENSION TREATMENT AND BLOOD PRESSURE TARGET ACHIEVEMENT AMONG PATIENTS UNDER TREATMENT AND MANAGEMENT AT THE COMMUNE LEVEL IN HANOI

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SUMMARY

Objectives: To evaluate the practice of treatment and the situation of achieving and sustaining blood pressure targets among patients under treatment and management of hypertension covered by health insurance at the commune level in Hanoi. Subjects and methods: The study was conducted on 438 hypertensive patients under treatment and management at two commune health centers in Socson district with the quasi-experimental design and pre- and post-intervention assessments. Patients were treated and their profiles were set up and were provided with physical examination, counsel and medications on a monthly basis at the selected communes. The practice of treatment among patients was assessed through face-to-face interviews and information was also extracted from their medical records. Results: The proportion of patients with adequate practice of hypertension treatment was 15.75%, increasing to 45.21% after the intervention ($p < 0.001$). The proportion of patients achieving blood pressure targets experienced a gradual rise over treatment duration. Patients with adequate practice of hypertension treatment were 1.9 times more likely to achieve blood pressure targets than the others. Conclusion: After one year participating in the treatment and management program, most patients had achieved blood pressure target. The intervention proved to be effective in enhancing patients' practice of hypertension treatment.

** Keywords: Hypertension; Blood pressure targets; Health insurance; Commune health center.*

INTRODUCTION

High blood pressure (or also known as hypertension) is one of the most common non-communicable and cardiovascular diseases and has become a public health issue. With a national population of 87 million

people, Vietnam is home to an estimate of 7.3 million hypertensive people.

Hypertension proves to be a dangerous disease whose complications often lead to severe sequelae, or even worse, fatality [6, 8]. When hypertension patients seek health care, it is often at late stage of the

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disease at which complications are already present, as they are not promptly detected, or if they are, not treated with a proper treatment regimen. When their blood pressure (BP) falls back to normal levels, patients tend to quit taking medications, follow only a single episode of treatment, have no further medical examination, or ignore daily monitoring of their own BP. Hypertension treatment aims to lower patients' BP to normal levels, sustain BP targets, and prevent hypertension-related complications [1, 6]. Adherence to hypertension treatment plays a crucial role in patients achieving and sustaining BP targets.

Health insurance (HI) works for the sake of community health, but not for profit. It helps reduce the burden of health costs for patients whenever they are sick or suffer from diseases, or have accidents. Besides, it ensures social security and helps people to avoid the medical poverty trap. Before 2015, the management of HI payment for hypertension treatment was applied to health facilities at the city level and higher levels and certain district hospitals; however, the management model was not consistent. At the commune level, HI management and payment model in the case of hypertension was unavailable in Hanoi; hence, hypertensive patients were not managed, monitored and treated in the community and every month they had to visit district or city hospitals for re-examinations, counsel and medications. As a result, they had difficulty in travelling to and from between their residence and health facilities, following referral procedures

and confronting with increased burden of health costs. The study on "*The model of HI-based management in hypertension examination and treatment at the commune level in Hanoi*" was conducted from 2014 to 2017, aiming to facilitate the treatment of hypertension among patients, contributing to mitigate the burden for patients, their families as well as the society, thereby bettering patients' quality of life. This article aims to: *Evaluate the practice of treatment and the situation of achieving and sustaining BP targets among patients under hypertension treatment and management with HI at the commune level in Hanoi.*

SUBJECTS AND METHODS

1. Subjects.

The study participants included those suffering from high BP who lived in Maidinh and Bacson communes from May 2014 to July 2018, were examined and treated for hypertension at two commute health centers and owned HI cards.

2. Methods.

** Study design:*

Quasi-experimental study design: We used a community-based intervention with pre-and post-intervention assessments without a control group. The intervention consisted of four phases as follows: (1) Screening for high blood pressure (HBP); (2) Setting up treatment and management profiles and conducting a baseline survey in July 2014. (3) Implementing the intervention related to treatment and management from July 2014 to June

2015 in CHCs and (4) Conducting a post-intervention assessment in July 2015.

** Sample size and sampling method:*

This two population proportion formula was applied to calculate the sample size:

$$n = \frac{\left\{ Z_{1-\alpha/2} \sqrt{2\bar{p}(1-\bar{p})} + Z_{1-\beta} \sqrt{p_1(1-p_1) + p_2(1-p_2)} \right\}^2}{(p_1 - p_2)^2}$$

Which confidence level = 1.96 ($\alpha = 0.05$); $p_1 = 0.61$: The proportion of hypertensive patients who were regularly treated for hypertension during screening examinations; $p_2 = 0.75$: the proportion of hypertensive patients who were regularly treated for hypertension after the intervention; power of test = 0.8. Calculating for a 20% loss to follow-up and the sample size was doubled due to the nature of multistage sampling. Therefore, 428 patients needed to be recruited to the study. In practice, 480 patients were selected to participate in the baseline and 438 patients were treated and managed during the conduct of this study. In this article, we only analyzed data of 438 patients.

** Sampling:* The sample was selected in two stages: (1) Stage 1: The study sample was stratified by commune. In either commune, 240 patients were recruited to the baseline and had their treatment and management profiles built up. (2) Stage 2: Continuous selection of patients among those being examined and treated for hypertension.

** Variables:*

(a) General characteristics: Age, gender, occupation.

(b) BP variables: Stages of hypertension, history of hypertension treatment.

(c) Group of variables related to practice of hypertension treatment.

** Criteria evaluation:*

- BP target:

The BP target for treatment is less than 130/80 mmHg.

- Practice of hypertension treatment is considered adequate (or attained) if a patient takes medication as prescribed, has his or her BP checked daily and has regular physical examination.

** Data collection techniques and tools:*

Pre- and post-intervention assessment: Personal interviews (or face-to-face interviews) with patients using structured questionnaires at two commune health centers. Patients were re-examined monthly, and their BP values were documented in re-examinations.

** Data analysis:*

Study data were cleaned and then entered into the EpiData database. Univariate and multivariate logistic regressions were used in this study. Data were analyzed using STATA 13.0. Statistical tests are significant at $p < 0.05$.

** Ethical issues:*

The study strictly followed the principles of ethics approved by Vietnam Military Medical University's Ethical Review Board. Study participations were informed that their participation in the study was completely voluntary and that they were entitled to be provided with information about the study.

RESULTS

1. General characteristics of hypertensive patients enrolling in the study.

Table 1: General characteristics of insured hypertensive patients under hypertension treatment and management in Maidinh and Bacson (n = 438).

Characteristics	Maidinh (n = 161; 36.76%)		Bacson (n = 277; 63.24%)		Total (n = 438)	
	n	%	n	%	n	%
Male	63	39.13	155	55.96	218	49.77
Mean age; mean (SD)	69.7	(9.9)	64.9	(11.7)	66.7	(11.3)
Being a farmer	129	80.12	204	73.65	333	76.03
Hypertension stages						
Stage I	58	36.03	80	28.88	138	31.50
Stage II	64	39.75	121	43.68	185	42.24
Stage III	122	24.22	76	27.44	198	26.26
Treated for hypertension	106	65.8	180	65.0	286	65.30

Table 1 shows that 161 out of 438 patients were treated and managed in Maidinh commune (36.76%), as opposed to 277 patients in Bacson commune (63.24%). Male patients accounted for 49.8%. The mean age of all patients was 66.7 years old (11.3 years old). The proportions of patients with stages I, II and III hypertension under treatment and management were 31.5%, 42.0% and 26.3%, respectively. Hypertensive patients who were previously provided with treatment accounted for 65.4%.

2. Treatment practice among hypertension patients.

Table 2: Practice of hypertension treatment before and after the intervention (n = 438).

Practice of hypertension treatment	Baseline survey		End-line survey		p (McNemar test)
	n	%	n	%	
Taking medications					
As indicated	187	42.69	417	95.64	< 0.001
Not as indicated	251	57.31	19	4.36	
Having a BP monitor at home	162	36.99	239	54.57	< 0.001
Regularly measuring BP at home	142	32.79	234	53.42	< 0.001
Time to check blood pressure					
Daily	123	28.08	252	57.53	< 0.001
When having regular examination	110	25.11	438	100.0	-

When presenting signs of HBP	137	31.28	221	50.46	-
Occasionally measuring BP	68	15.53	144	32.88	-
Having routine physical examination for HBP	332	79.05	438	100.0	< 0.001
Practice of hypertension treatment					
Adequate	69	15.75	240	45.21	< 0.001
Inadequate	369	84.25	198	54.79	

The proportion of patients taking anti-hypertensive drugs as indicated by doctors before the intervention was 42.69%. This figure increased to 95.64% after the intervention was conducted ($p < 0.05$). The proportion of patients having their BP checked at home also rose from 32.79% before the intervention to 53.41% after the intervention. Besides, 100% of the patients with regular physical examination had their BP measured and 57.53% had their BP checked on a daily basis. These figures increased significantly from before the intervention ($p < 0.05$).

The proportion of patients with adequate practice of hypertension treatment was 15.71% before the intervention, experiencing an almost 3-fold increased to 45.21% after the intervention ($p < 0.001$).

* *Achieving and sustaining BP targets:*

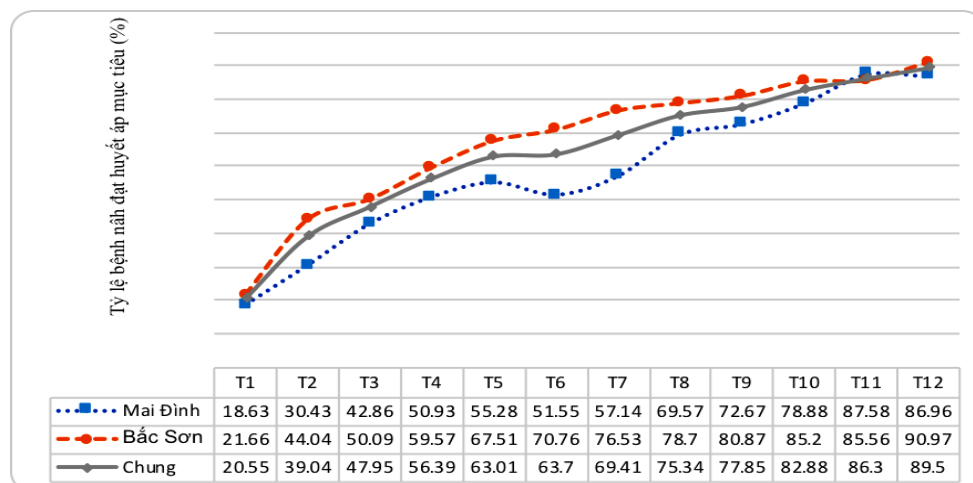


Figure 1: Proportion of patients achieving BP targets at the time of re-examination (n = 438).

The proportion of patients achieving BP targets increased over treatment duration. Patients were re-examined for elevated BP on a monthly basis. At T1 (1st re-examination), only 20.55% of the patients achieved BP targets (Maidinh: 18.60% and Bacson: 21.66%). The figure increased to 39.00% at T2 (2nd re-examination), 63.70% at T6 (6th re-examination) and 89.50% at T12 (12th re-examination, or one year after participating in the treatment and management program).

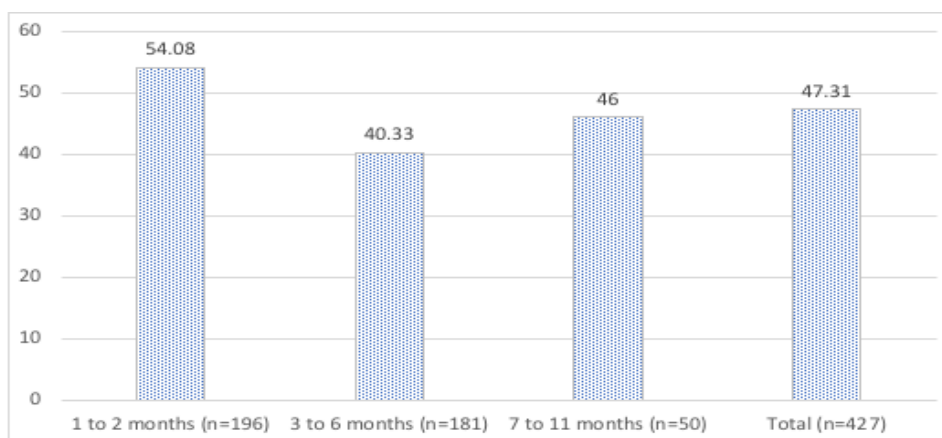


Figure 2: Proportion of sustaining BP targets among patients who achieved BP targets (n = 427).

Among 427 patients achieving BP targets during treatment, 47.3% of them succeeded in sustaining those targets. Patients who sustained BP targets right in the first and second month accounted for 54%. The rates for those sustaining BP targets between the 3rd month and the 6th month, and between the 7th month and 11th month were 40.3% and 46%, respectively.

Table 3: Multivariate model of the association between patients' practice of treatment and sustenance of BP targets.

Variable	n (%)	OR	95%CI	p
Treatment practice				
Not attained	76 (39.18)	1	1	
Attained	126 (54.08)	1.93	1.29; 2.9	0.001
Age	-	1.00	0.98; 1.01	0.74
Marital status				
Married	107 (42.13)	1	1	...
Others	95 (54.91)	1.66	1.1; 2.5	0.016
Stages of hypertension				
Stage I	25 (45.45)	1	1	
Stage II	78 (47.85)	1.26	0.66; 2.43	0.48
Stage III	99 (47.37)	1.33	0.70; 2.51	0.38
History of treatment				
No treatment	76 (53.15)	1	1	
Regular treatment	68 (37.57)	0.52	0.33; 0.83	0.006
Irregular treatment	58 (56.31)	1.23	0.73; 2.10	0.43

Lifestyle				
Healthy	42 (57.53)	1	1	
Unhealthy	160 (45.20)	0.58	0.34; 0.99	0.047
n = 427; p = 0.0001				
* Dependent variable: Sustenance of BP targets				
* Main independent variable: Treatment practice				

The multivariate logistic regression analysis with sustaining BP targets as dependent variable shows that when all other independent factors, including age, marital status etc., patients who achieved BP targets were 1.93 times more likely to sustain them than those who failed to achieve such targets (95%CI; OR: 1.29; 2.9).

DISCUSSION

1. Practice of hypertension treatment.

Patients practiced hypertension treatment better after the intervention. More precisely, the proportion of patients taking medication as prescribed increased from 43% (before the intervention) to 96% (after the intervention). More than half of the patients had BP monitors and regularly checked their BP at home. Those patients were treated and managed at the commune health centers where they were provided with physical examinations schedules and dispensed with medications every 30 days; therefore, all of them had BP measured during physical examination. Before the intervention, the proportion only stood at 25%, although 60% of patients received hypertension treatment. It can be seen that before the intervention, only a small number of patients adhered to treatment. However, it is noted that this result was based on patients' self-reports; therefore, the actual proportion of patients adhering to treatment was probably lower. In the post-intervention assessment, apart from collecting data from interviews with patients, we compared them with those

available in corresponding outpatient medical records.

Patients' practice of hypertension treatment was assessed based on whether they took antihypertensive drugs as prescribed, their BP was measured daily and their routine hypertension were checked. The proportion of patients with adequate practice after the intervention was higher than that before the intervention (50% vs. 13%). The proactive provision of health services from health facilities, therefore, encouraged patient compliance with treatment.

2. Achieving and sustaining BP targets.

The proportion of patients achieving BP targets in the study conducted in Socson rural district increased over time. In the first re-examination (1st month), this rate was only 20.6%; most of those patients achieving BP targets suffered from stage I hypertension. For other patients with more severe stages, it took longer to achieve BP targets. The proportion of patients achieving BP targets over treatment duration indirectly indicated the high probability of patients sustaining BP

targets and the effectiveness of the management model. The proportion of achieving BP targets in our study in Socson rural district exceeded that in the model of management, monitoring. Controlled treatment of hypertension at Bachmai was 78.2% compared to 52.3 - 75% at certain local hospitals [2]. It was even higher than the figure in a study carried out in Thua Thien Hue [2]. However, it is noted that our study in Socson was conducted at grassroots health levels, patients were managed in the intervention model after screening examinations and they suffered from milder levels of hypertension than those seeking examination and treatment at hospitals. Besides, with regard to hypertension treatment, patients with health insurance cards are better at controlling their BP than those without health insurance cards [7]. This explains that the proportion of achieving BP targets in our study in Socson was higher than in above studies. However, our study result was equivalent to that in a study by Thanh et al (94.7% after 12 months of intervention) which also concluded that the proportion of achieving BP targets increased over management duration [4] and similar to that in a study by Thuy et al. Hoankiem district had the decreasing number of hypertensive patients over re-examinations [5].

Our study shows that adequate practice of hypertension treatment is the prerequisite for a patient to achieve and then sustain BP targets. Patients with adequate practice of hypertension treatment were two times more likely to sustain BP targets than those with inadequate practice.

LIMITATIONS

The limitation of this study lies in its having no control group. Besides that, the information about the history of hypertension detection and treatment was collected from interviews with patients. Therefore, information bias, such as recall bias or informant bias, is to some extent inevitable.

The study was only conducted at two commune health centers of Socson district due to limited resources. However, the intervention model was later implemented in several other settings after this study. In addition, the study only focused on treatment and management of patients with health insurance at commune health centers while not covering uninsured ones.

CONCLUSIONS

The intervention proved to be effective in enhancing patients' practice of hypertension treatment. The proportion of patients with adequate practice of hypertension treatment was 15.75%, increasing to 45.21% after the intervention. The proportion of patients achieving BP targets experienced a gradual rise over treatment duration. Patients with adequate practice of hypertension treatment were 1.9 times more likely to achieve BP targets than the others.

RECOMMENDATIONS

The model should be applied in other localities, patients should be encouraged to comply with treatment and the treatment and management should be extended to cover even hypertensive patients without health insurance.

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