

**Prevalence, awareness, correlates, treatment and control of hypertension
in a rural community of Waw Township, Bago Division**

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Hypertension is an important cause of cardiovascular morbidity and mortality. A cross-sectional survey was conducted on 644 subjects (20 years and above, mean age 48.9 years) in Thuyethamain Village in Waw Township, Bago Division. The objectives were to determine the prevalence of hypertension, assess the degree of awareness, taking treatment and control of high blood pressure, and to identify the correlates of hypertension awareness. Hypertension was defined as a mean systolic blood pressure ≥ 140 mm Hg, diastolic blood pressure ≥ 90 mm Hg, and/or use of antihypertensive medications. The overall prevalence of hypertension was 29% (95% confidence interval (95% CI): 25.5%–32.7%). Among hypertensives, 43.9% were aware of the condition, while 28.9% were being treated and 16.6% were under control. Multivariate analysis showed that women have better awareness of hypertension (odds ratio (OR) = 5.1, 95% CI: 1.9–13.7). Other factors independently associated with increased awareness of hypertension were higher education status (OR for high school and above level compared to no schooling = 3.3, 95% CI: 1.2-9.5), and dependents compared to manual workers (OR = 3.5, 95% CI: 1.2-9.7). In this study, over half of hypertensive subjects were unaware of the condition and less than a third was under treatment. These observations highlight the need for regular screening coupled with educational programs to promote hypertension awareness in the community.

INTRODUCTION

Uncontrolled hypertension (HT) is an established risk factor for the development of vascular diseases. Cardiovascular diseases (CVD) account for nearly a third of all deaths worldwide [1]. CVD are increasing in developing countries [2,3] and it has been estimated that CVD will be the major cause of morbidity and mortality in these countries by the year 2020 [4]. Consequently, the prevention of risk factors for CVD is a public health priority worldwide [1]. Hypertension is a premier risk factor for CVD, which is easily recognized if sought, and can be treated effectively. Treatment of high blood

pressure (BP) has been consistently reported to reduce the risk of CVD [5].

In Myanmar, as in most other countries, hypertension is a major public health problem. According to a previous CVD survey, the prevalence of HT in rural areas was 12.4% [6]. But the prevalence varies in different communities with reported lowest prevalence in Laydaunggan (2.1%) and the highest prevalence in Thonegwa (38.4%) [7, 8].

The prevalence, degree of awareness, treatment, and control of high BP in rural communities of Waw Township were previously unknown. So this study was conducted with the following objectives.

- ◆ To determine the prevalence of hypertension
- ◆ To assess the degree of awareness, taking treatment, and control of hypertension
- ◆ To identify the correlates of awareness of high blood pressure

MATERIALS AND METHODS

Study area and population

Community survey was carried out in Thuyethamain village, Waw Township in Bago Division during November 2004. Cross-sectional study design was employed. A total of 644 persons aged 20 years and over participated in the study.

Sample size and sampling procedure

Assuming that a crude prevalence of hypertension was 20% and desired precision 0.03, the calculated sample size was 640 at 95% confidence level. Thuyethamain village in Waw Township was purposely selected for the study of hypertension. For recruitment of the study subjects, a list of eligible persons (aged 20 years and above currently living in the village) was taken before the survey. From this list of 987 persons (sampling frame), random numbers were generated using EPITABLE program to have a required sample size.

Data collection

The survey had two principal components: (a) interviewing the subjects using a questionnaire and (b) measurement of BP and anthropometry. Informed written consent was obtained from all the participants before the interview.

Study questionnaire

Before the data collection commenced, team members were trained on the use of research instruments and methods of data collection. Investigators administered a pre-tested structured questionnaire, which collected information on demographic, socioeconomic, medical history, and

information on lifestyle habits such as smoking and alcohol consumption.

Measurement of BP and anthropometry

Before the BP was measured, the investigator made sure that the subjects had not consumed any hot beverages, such as tea or coffee or smoked/chewed tobacco or undertaken vigorous physical activity within 30 minutes preceding the household visit. If they had, then the measurements were postponed by 30 minutes. Medical officers measured the BP of all the participants twice using a mercury column sphygmomanometer and a standard protocol. Both BP readings were obtained from the seated subject using a cuff of an appropriate size, with the arm supported and the sphygmomanometer at the level of the heart [9]. Blood pressure was taken twice (5 minutes apart) only after the interview which usually lasted about 10 minutes. The BP cuff was inflated to 30 mmHg above the pressure at which the radial pulse disappeared, and then deflated slowly. Phases 1 and 5 of the Korotkoff sound were taken as indicators for systolic blood pressure (SBP) and diastolic blood pressure (DBP) respectively [9]. Both SBP and DBP readings were recorded to the nearest 5 mmHg. The average of the two readings of SBP and DBP was taken as the BP of the participant.

Body weight and height of all the participants were also measured. Weight was recorded to the nearest 0.5 kg, while height was measured to the nearest 0.5 cm. Body mass index (BMI) was computed as the weight in kilograms divided by the square of the height in meters.

Working definitions

Hypertension

The HT status of the subjects was assessed based on the criteria formulated by the World Health Organization–International Society of HT (WHO–ISH) and the US Seventh Joint National Committee (JNC VII) report on the prevention, detection,

evaluation, and treatment of high BP: SBP ≥ 140 mmHg or DBP ≥ 90 mmHg, or the use of antihypertensive medications [10,11].

Awareness

A subject was said to be "aware" of HT status if he/she reported a prior diagnosis of HT (or elevated BP) made by a healthcare provider.

Treatment

It was defined as current use of a prescription medication for lowering the elevated BP; we considered only pharmacologic treatment used at the time of the survey.

Control

Control of HT was defined as antihypertensive treatment associated with SBP and DBP less than 140 mmHg and 90 mmHg, respectively [10]. Control rate was calculated out of all hypertensives.

Current smokers

Any person who smoked a tobacco product at the time of the study or persons who used to smoke but had stopped smoking <6 months before the interview.

Ex-smokers

Any person who used to smoke and had stopped smoking ≥ 6 months before the interview.

Statistical methods

The mean SBP and DBP in both sexes and in different age groups were compared using unpaired student's t and One-way ANOVA tests as appropriate. A Chi-square test was used to compare the prevalence of HT in men versus women. A Chi-square trend test was used to compare the prevalence of HT among different age groups. The distribution of BP in the study sample was categorized into JNC VII stages of BP [11]. Multiple logistic regression was used to examine the determinants of awareness of HT. Variables considered for models evaluating correlates of HT awareness included age, sex, smoking, alcohol drinking, marital status, education, occupation and BMI. All

statistical analyses were performed using the SPSS 10.0 for Windows and Stata 6 software. A "p" value of less than 0.05 was considered statistically significant.

RESULTS

Background characteristics of the study subjects

Among 644 study participants, 223 (34.6%) were males and 421 (65.4%) were females. Their mean (SD) age was 48.9 (15.4%) years. More than 90% were Bamar. Median family income per month was 30,000 kyats (range, 5000 to 300,000 kyats). Majority (53.4%) was manual workers by occupation and 24.8% were dependents. Regarding the educational status, 31.7% were primary school level. Illiteracy rate was 7.9% in this village.

Prevalence of HT and mean BP levels

In our study population, 187 subjects (66 men and 121 women) were hypertensive, yielding an overall prevalence of 29% (95% CI: 25.5%–32.7%). Prevalence of HT was more or less similar in both sexes: 29.6% (95% CI = 23.7%–36.1%) in men compared to 28.7% (95% CI = 24.5%–33.3%) in women. Mean SBP and DBP did not also differ among men and women (Table 1).

Table 1. Prevalence of hypertension, mean systolic and mean diastolic blood pressure in the study sample by gender

Variables	Gender		p-value
	Males	Females	
Hypertension %	29.6	28.7	0.44*
SBP(mmHg) SD	123.6 (23.5)	121 (24.4)	0.2**
DBP (mmHg)SD	80.4 (12.5)	79.1 (12.9)	0.2**

* Chi-square test

** Student's t test

But HT prevalence, mean SBP and DBP increased significantly with age (Table 2).

Table 2. Prevalence of hypertension, mean systolic and mean diastolic blood pressure in the study sample by different age groups

Variables	Age groups			p-value
	25-44 year	45-64 year	65 & above	
Hyper-tension %	17	33.6	47.2	0.001*
SBP (mmHg) SD	113.5 (16.8)	125 (25.5)	135 (27.7)	< 0.001**
DBP (mmHg) SD	77.2 (11.4)	81.3 (13.4)	81.6 (13.7)	< 0.001**

* Chi-square trend test

** One-way ANOVA

Classification of BP status according to JNC VII grades

Table 3 displays the classification of BP according to WHO - JNC 7 grades [11]. Less than one third (31%) of our participants had "normal" BP. There was no significant gender difference in distribution of BP status (not shown in the table).

Table 3. Distribution of BP according to JNC VII Guidelines (2003)

BP status	Male	Female	Total
	No. (%)	No. (%)	No. (%)
Normal (SBP <120 and DBP <80 mmHg)	77 (34.5)	174 (41.3)	251 (31)
Prehypertension (SBP 120-139 and DBP 80-89 mmHg)	80 (35.9)	126 (29.9)	206 (40)
Stage 1 (SBP ≥ 140 mm Hg and/or DBP ≥ 90 mm Hg)	43 (19.3)	73 (17.3)	116 (18)
Stage 2 (SBP ≥ 160 mm Hg and/or DBP ≥ 100 mm Hg)	23 (10.3)	48 (11.4)	71 (11)

Awareness, its correlates, treatment, and control of HT

Among the hypertensives, 43.9% (82/187) were aware of their HT status. But 28.9% (54/187) were on treatment and only 16.6% (31/187) meet the criteria for controlled HT. In multivariate regression analysis, better awareness of HT was found in women and

persons with higher education level (high school and above). It also increased independently compared to manual workers (Table 4).

Table 4. Determinants of awareness of hypertension (Multivariate Logistic Regression Analysis)

Variables	Odds Ratio	95% Confidence Interval	p-value
<i>Age group</i>			
20- 44 years	1		
45- 64 years	1.38	0.56-3.37	0.48
≥ 65 years	1.76	0.56-5.49	0.33
<i>Gender</i>			
Male	1		
Female	5.06	1.87-13.71	0.001
<i>Marital status</i>			
Unmarried	1		
Married	1.34	0.41-4.41	0.61
<i>Education</i>			
No schooling	1		
Less than high school	2.43	0.92-6.43	0.07
High school & above	3.34	1.18-9.48	0.02
<i>Occupation</i>			
Manual	1		
Non-manual	1.26	0.46-3.46	0.65
Traders	0.53	0.17-1.62	0.27
Dependent	3.47	1.25-9.67	0.02
<i>Smoking status</i>			
No	1		
Current smoker	1.08	0.46-2.52	0.86
Ex-smoker	1.77	0.61-5.11	0.29
<i>Alcohol</i>			
No	1		
Yes	1.8	0.57-5.63	0.31
<i>Body Mass Index</i>			
Normal (< 25)	1		
Overweight (25-30)	1.44	0.44-4.68	0.54
Obesity (> 30)	0.68	0.09-5.35	0.71

DISCUSSION

It is being increasingly recognized that high BP is an important public health problem in developing countries [12]. In our cross-sectional study, we observed that 29% of subjects were hypertensive according to the JNC VII–WHO criteria [11]. The overall prevalence of HT in this study was found to

be higher than that of recent studies in Myanmar: 22.4% in Kayin State, 21.9% in Kanaung village and 15.5% in Pardagyi village of Kyauktan Township [13,14,15].

Our data are also consistent with the high prevalence reported from other developing countries (27.2% in China, 29.4% in Ghana) [16,17] and even higher than 21% prevalence in rural India [18].

Kalavathy and colleagues found that 51.8% of the elderly in South India had HT [19]. The Hypertension Study Group, in their multicentre study, found that the overall prevalence of HT in the elderly was 65% [20]. Our study also showed a progressively increasing prevalence with age, with 47.2% of those > 65 years.

There was a striking lack of awareness of elevated BP among participants in our study; over half of hypertensive subjects were unaware of their condition. As there was a relative paucity of local data on awareness, taking treatment and control of HT, we compared our findings with some recent studies conducted in the neighbouring countries. In the Hypertension Study Group survey, awareness of HT was 45% among the elderly from India and Bangladesh. InterASIA study in China showed that only 44.7% of hypertensives were aware of their condition [16, 20]. Compared to these figures, degree of awareness of HT in Thuyethamain village was marginally lower at 43.9%. Poor awareness of elevated BP may be due to the "silentness" of the condition and lack of regular health check-ups at the study area.

Moreover, the proportion of hypertensives treated and adequately controlled was also low (28.9% and 16.6% respectively). They were more or less similar to those reportedly low levels from China (28.2% treated, 8.1% controlled), India and Bangladesh (40% treated, 10% controlled). The proportion of controlled hypertensives was found to be slightly higher than those in the above studies [16, 20]. Persons with higher

education status, women and dependents were more likely to be aware of their diagnosis of HT. The finding of better awareness in higher educated persons was important but not surprising. Better awareness and treatment of hypertension in women had been consistently documented [12, 21, 22] but the reasons were not entirely clear. Differences in health seeking behaviors and a greater opportunity for casual BP screening could contribute to this gender-related difference. Increased awareness in dependents could be explained by the fact that great majority of them (81%) were women.

The previous study of hypertension among 40 years and above population in urban area of Bago Division reported that women with higher education, obesity and younger ones were found to have better hypertension awareness [23].

It was found in the present study that persons with CVD risk factors (smokers, obese and overweight) also did not know their hypertensive status. Low awareness about HT among them may indicate a marker of reduced overall health awareness in this high-risk group and may have an important public health implication.

As our study included a single community and BP measurement was done on a single day, the prevalence could be over-estimated. It was recommended that BP should be recorded on multiple occasions before diagnosis of HT is made. Because of this and being a small scale study, the findings of this study should be considered an upper estimate of the prevalence of HT in the community surveyed.

CONCLUSION

This study showed that prevalence of HT in the study area was high and over half of the hypertensives were unaware of their status. Less than a third was being treated. There was a lack of awareness of elevated BP even among the high-risk persons. These

observations highlight the need for regular blood pressure screening coupled with educational programs to promote hypertension awareness in the community.

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