

## Prevalence of hypertension in Pardagyi village, Kyauktan Township

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A cross-sectional community survey was carried out in Pardagyi village, Kyauktan Township in October 1998 to determine the prevalence of hypertension in adults aged 25 to 59 years and to identify the potential risk factors for hypertension in that area. A total of 394 subjects participated in the study. Overall prevalence of hypertension was 15.48% (diastolic greater than or equal to 90 mmHg, or systolic greater than or equal to 140 mmHg, or currently taking antihypertensive medication). The distribution of different categories of hypertension showed mild hypertension (diastolic blood pressure 90-104 mm Hg) to be the most frequent form (83.6%). Among the hypertensives, 75.4% were aware of their diagnosis and 51.5% were taking treatment. Hypertension awareness and treatment were found to be significantly higher in women ( $p < 0.01$ ). Regarding the risk factors, older age (45 to 59 years), being a current smoker, Body Mass Index equal to or more than 25 and self-reported diabetes mellitus were associated with increased odds of being hypertensive in this study.

### INTRODUCTION

The improved control of infectious diseases during recent decades has dramatically changed the health profile of many economically developing countries [1]. This is reflected in a prolongation of life expectancy and emergence of cardiovascular disease as a leading cause of morbidity and mortality in such countries [2]. Evidence from epidemiological studies indicates that a strong correlation between the arterial blood pressure and cardiovascular mortality and morbidity. The higher the blood pressure, the greater the risk for an individual to experience stroke, myocardial infarction, angina pectoris, heart failure and renal failure[3].

The prevalence of hypertension has been also increasing in Myanmar during the last decade. In previous cardiovascular disease survey, prevalence of hypertension was 12.5% and 14.6% for rural and urban areas of Myanmar respectively [4].

The prevalence and potential risk factors for hypertension in rural areas of Kyauktan Township were previously unknown. So this study was conducted with the following objectives.

1. To determine the prevalence of hypertension in adults aged 25 to 59 years living in Pardagyi village, Kyauktan Township.
2. To identify the potential risk factors for hypertension in the study population.

### MATERIALS AND METHODS

#### *Study area and population*

Community survey was carried out in Pardagyi village, Kyauktan Township in October 1998. A cross-sectional study design was employed. A total of 394 persons aged 25 to 59 years participated in this study.

#### *Methods of data collection*

Before the actual data collection commenced, the study team was trained for

the use of research instruments and methods of data collection. To minimize the inter and intra-observer variation, method of blood pressure (BP) measurement was instructed and validity assessment was done on five medical officers included in the survey team. Consistency assessment was done on standard mercurial sphygmomanometers and weighing scales were also calibrated.

During the actual data collection, the surveyors created a friendly atmosphere, interviewed the subjects, measured their blood pressure and made anthropometric assessments.

Data on demographic, socioeconomic and dietary patterns were included in the interview. Blood pressure in lying down position was taken twice (5 minutes apart) only after the interview which usually lasted about 10 minutes, so as to eliminate the influence of activity on blood pressure. Systolic blood pressure (SBP) corresponded to Korotkoff phase I and diastolic blood pressure (DBP) to phase V. SBP and DBP for each individual were determined by averaging of the two readings.

#### *Working definitions*

For the purpose of prevalence of hypertension, persons were considered hypertensive if they met one of the following conditions set by the 1988 Report of the Joint National Commission on Detection, Evaluation and Treatment of High Blood Pressure (JNC 1988):

- (1) a diastolic blood pressure (DBP) of greater than or equal to 90 mm Hg;
- (2) a systolic blood pressure (SBP) greater than or equal to 140 mm Hg;
- (3) reporting currently using antihypertensive medication (regardless of blood pressure measurements) [5]. Prevalence estimates for the specific categories also followed JNC 1988 guidelines.

#### *Statistical methods*

The number of hypertensive subjects was

divided by the number of respondents to yield the prevalence of hypertension in the study area. Bivariate analysis was done for the identification of possible risk factors. The association between independent and dependent (outcome) variable was expressed as an odds ratio (OR) with its 95% confidence interval (CI).  $P < 0.05$  was used as the definition of statistical significance.

#### *Ethical consideration*

This study was approved by the Medical Ethics Committee of the Department of Medical Research (Lower Myanmar).

## **RESULTS**

#### *Background characteristics*

A total of 394 persons participated in this survey. Among them, 136 (34.5%) were males and 258 (55.5%) were females. Their mean age was 38.4 years (range, 25 to 59 years). Approximately half of the participants (48.1%) were manual labourers and 30.3% were dependents. Of the remainder, 17.6% were engaged in own business and 3.4% in office work. Median family income per month was 6000 Kyats (range, 550 to 90000 Kyats). Regarding the educational status, 60.8% were primary school level. Illiteracy rate was 7.9% in this village.

#### *Prevalence of hypertension*

Out of 394 participants, 61 subjects were found to have hypertension ( $SBP \geq 140$  and/or  $DBP \geq 90$ ). Consequently the prevalence of hypertension in the study area was estimated to be 15.48% (95% CI=12.05-19.43).

Further analysis of prevalence of hypertension in relation to age groups revealed a steadily increasing trend towards older age groups (Table 1). There was no sex difference among hypertensives where female and male hypertensives were 16.28% and 13.97% respectively ( $p = 0.54$ ).

Table 1. Prevalence of hypertension in different age groups

Age groups (years)	Study subjects	Hypertensive	Prevalence	95%CI
≥25-34	165	11	6.60%	3.37-11.62
≥35-44	114	15	13.15%	7.56-20.77
≥45-54	78	19	24.35%	15.35-35.4
≥55-59	37	16	43.24%	27.1-60.51

Chi-square = 36.76 p = <0.001

The proportions of different types of hypertension such as borderline isolated systolic hypertension (BISH), isolated systolic hypertension (ISH), mild, moderate and severe hypertension were calculated and these are summarized in Table 2. Mild hypertensives were the most common (83.6%) followed by moderate hypertension (8.2%) and severe hypertension (6.5%).

Table 2. Distribution of different categories of hypertension\*

Types	Criteria	Number (percent)
Borderline isolated systolic hypertension (BISH)	SBP 140-159 mmHg DBP <90mmHg	1 (1.64%)
Isolated systolic hypertension (ISH)	SBP≥160mmHg DBP<90mmHg	Nil
Mild hypertension	DBP 90-104 mmHg	51(83.6%)
Moderate hypertension	DBP 105-114 mmHg	5 (8.2%)
Severe hypertension	DBP≥115mmHg	4 (6.56%)

\* JNC 1988 criteria

Among the cases, 46 (75.4%) were aware of their diagnosis but only 35 (51.5%) were taking antihypertensive treatment. Hypertension awareness and treatment were found to be significantly higher in hypertensive women (Table 3).

#### Risk factors analyses

Potential risk factors for hypertension in the study area were presented in Table 4. Older age group (45 to 59 years), being a current

smoker, Body Mass Index (BMI) equal to or more than 25 and self-reported diabetes mellitus were associated with increased odds of being hypertensive.

Table 3. Hypertension awareness and treatment among hypertensive individuals by gender

Group	All hypertensives	
	Number (%) aware	Number (%) treated
Total (n=61)	46 (75.4%)	35 (51.5%)
Sex		
Men (n=19)	10 (52.6%)	6 (31.5%)
Women (n=42)	36 (85.7%)	29 (69.1%)
p-value	0.005	0.006

Table 4. Potential risk factors for hypertension in the study area

Variables	Odds Ratio	95%CI	p-value
Age (RC=≥25-34 years)			
≥35-44 years	1.96	0.85-4.48	0.11
≥45-54 years	5.16	2.34-11.4	<0.001
≥55-59 years	9.54	3.89-23.4	<0.001
Sex (RC-male)			
Female	1.58	0.86-2.92	0.14
Education(RC=illiterate)			
Less than high school	2.87	0.67-12.43	0.16
High school and above	2.42	0.45-12.88	0.32
Marital status(RC=single)			
Married/widow	2.23	0.85-5.82	0.12
Family history (RC=no)			
Yes	1.39	0.87-1.71	0.1
Smoking (RC=non-smoker)			
Ex-smoker	0.95	0.21-4.38	0.98
Current drinker	1.79	1.02-3.16	0.04
Alcohol drinking (RC=never drinker)			
Ex-drinker	2.24	0.87-5.71	0.09
Current drinker	0.91	0.42-1.97	0.82
Obesity (RC=BMI<25)			
BM ≥ 25 BM(I)	1.95	1.12-3.39	0.03
Physical activity (RC=sedentary)			
Mild	0.76	0.49-1.28	0.11
Moderate	0.58	0.19-1.24	0.07
Salt consumption (RC=<30 ticals per day)			
≥30 ticals per day	1.67	0.96-2.92	0.08
Self-reported diabetes mellitus (RC=no)			
Yes	11.25	1.01-126.1	0.04

RC = Reference Category

## DISCUSSION

Overall prevalence of hypertension in the present study was 15.48%. According to the nationwide cardiovascular diseases survey, that of hypertension in rural area of Myanmar was reported to be 12.5% [4]. Other surveys carried out in different areas of Myanmar have given wide range of results. It was found that the highest prevalence was 38.4% at Thonegwa [6] and the lowest was 2.1% at Laydaunggan [7]. Regional variation in prevalence of hypertension could be explained in part by ethnicity, dietary constituents, different cutoff BP values in defining hypertension and different age range of the study populations.

Certain findings in our study replicated the patterns observed in other BP surveys. For instance, the general pattern of an increasing prevalence of hypertension with age has been well recognized in other studies abroad [3]. Likewise, the better awareness and treatment of hypertension in women has been consistently documented [8, 9, 10] but the reasons are not entirely clear. Differences in health seeking behaviors could contribute to this gender-related difference.

The distribution of different categories of hypertension showed mild hypertension to be the most frequent form (83.6%). It was consistent with previous hypertension survey in Thonegwa Township where mild hypertensives formed the majority (78.1%) [6]. It was also in line with the position elsewhere in other countries, for example in Spain (66%) and in United States (80%) [11, 12].

Older age, being a current smoker, high BMI and self-reported diabetes mellitus turned out to be significant risk factors for hypertension in our study. The association of hypertension with BMI and diabetes mellitus has been reported previously on numerous occasions [13, 14, 15]. The effect of smoking on cardiovascular system and its

association with hypertension was also well-known.

It was reported in Thonegwa BP survey that family history, consumption of salt and soda rich snacks were strongly associated with hypertension. Contrary to this and other studies [6, 16, 17] physical inactivity, family history and salt intake were not found to be significant correlates of hypertension. Lack of association with these well-known risk factors in the present study may be due to its small sample size.

There was a regional variation in hypertension prevalence and risk factors in our country. To what extent well-establish risk factors such as age, weight, salt intake and physical inactivity, accounted for observed regional variation in prevalence is an important issue worthy of additional investigation. The role of these and other possible risk factors such as ethnicity, dietary constituents, socioeconomic status and education level should be explored further in other areas of Myanmar.

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