

## Risk factors assessment for hypertension in a squatter settlement of Karachi

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### Abstract

**Objective:** To assess the risk factors for hypertension in adults (age more than 15 years) in a squatter settlement of Karachi.

**Methods:** Cross-sectional survey of adults more than 15 years old in a squatter settlement of Karachi through random sampling method.

**Results:** A total of 327 adults were approached, 165 (50.5%) were males and 162 (49.5%) females. Blood pressure was measured in 63 (38%) males and 135 (83%) females. Out of which, 11 (17.5%) males and 19 (14%) females were screened hypertensive. Hypertensives were older as compared to normotensives ( $p < 0.001$ ). The mean BMI of hypertensives ( $25.6 \pm 4.5 \text{ kg/m}^2$ ) was significantly higher ( $p = 0.008$ ) than normotensives ( $22.9 \pm 5.0 \text{ kg/m}^2$ ). Hypertensives were 9.7 times more likely to be diabetic as compared to normotensives in this study ( $p < 0.001$ ). On analyzing the relationship of hypertension with other variables, no significant difference was noticed for education ( $p = 0.68$ ), smoking status ( $p = 0.46$ ), family history ( $p = 0.31$ ) and occupation ( $p = 0.27$ ).

**Conclusion:** Prevention and control of hypertension is essential as the life expectancy is increasing in developing countries as well. The main emphasis according to this study, should be on controlling the BMI through weight reduction and regular exercise. Awareness about the risk factors for hypertension among the population is required to decrease the double burden on the society (JPMA 55:390;2005).

### Introduction

Cardiovascular diseases (CVD) are a major cause of death in developed countries, and are also on the rise in developing countries.<sup>1,2</sup> According to global burden of disease pattern, South Asia is facing the burden of non-communicable diseases.<sup>3</sup> Our country being a developing country is encountering a double burden of disease as part of the epidemiological transition. This will lead to increased prevalence of hypertension as a result of increased life expectancy and rapid urbanization. High blood pressure is one of the common cardiovascular risk factors in Pakistan affecting one in three individuals over the age of 45 years.<sup>4</sup> The National Health Survey of Pakistan (NHSP-1990-94) shows that 5.5 million men and 5.3 million women were hypertensives.<sup>5</sup>

Hypertension is a multifactorial disorder but any individual risk factor can contribute to overall increase in blood pressure.<sup>6</sup> This study aims to assess the risk factors for hypertension in adults above 15 years of age in a squatter settlement of Karachi.

### Subjects and Methods

This study is a cross-sectional survey of Gulshan-e-Sikanderabad, a squatter settlement situated near Ziauddin Medical University (ZMU), Clifton. It is divided into five blocks with a population of approximately 20,000, composed mainly of migrants from the northern areas of Pakistan. It is a low socio-economic area; the majority of

males are labourers or transporters with a poor literacy level. ZMU is running a Primary Health Care (PHC) center in Block-I, which has a population of approximately 3500. The houses were selected from this block for ease of referral of the subjects to the center.

The sample size was calculated by using EpiInfo-6 software program, based on the assumption of an estimated prevalence of hypertension in 25% of the households and a desired precision of five percent. There are 433 households in the block and 64 houses were randomly selected for the survey using Epi-Info version 6.04b.

The investigator measured and recorded the blood pressure (BP) of the subject in the right arm, with the subject sitting quietly, using a calibrated aneroid sphygmomanometer. Those having systolic BP more than 130 mmHg and/or diastolic BP 80 mmHg or above were referred to the PHC Center. Weight was measured in kilograms using a bathroom scale and the standing height was measured in centimeters using a measuring tape.

Information was obtained using a pre-tested structured questionnaire, which recorded blood pressure, weight in kilograms, height in centimeters, age in years, sex, occupation, education, history of diabetes, family history of hypertension (first degree relatives), smoking status (former, current or non smoker). Body mass index (BMI) was calculated in  $\text{kg/m}^2$ .

Data entry and analysis was done using Epi-Info 6.04b. Risk factors were evaluated using Odds Ratio. Chi Square test was used for comparison between categorical variables and t-test for comparison between numerical variables in the two groups at significance level  $\alpha = 0.05$  were estimated.

### Results

A total of 345 adults were approached, 18 were excluded, as they were known hypertensives. Of the remaining, 165 (50.5%) were males and 162 (49.5%) females. Blood pressure was measured in 63 (38%) males and 135 (83%) females, out of which, 11 (17.5%) males and 19 (14%) females were screened hypertensive.

According to JNC VII classification<sup>7</sup>, for systolic BP, 52.5% were normal, 40.4% were pre-hypertensives, 5.6% were stage I and 1.5% were stage II. Similarly for diastolic BP, 53% were normal, 32.8% were pre-hypertensives, 10.1% were stage I and 4% were stage II.

All classes of hypertension were then grouped into one for further analysis and comparison with the different variables. Figure 1 shows age of hypertensives ( $38.7 \pm 16.5$ ) was significantly greater ( $p < 0.001$ ) than normotensives ( $29.2 \pm 13.6 \text{ kg/m}^2$ ). Figure 2 shows that mean BMI of hypertensives ( $25.6 \pm 4.5 \text{ kg/m}^2$ ) was significantly higher ( $p < 0.008$ ) than that of normotensives ( $22.9 \pm 5.0 \text{ kg/m}^2$ ).

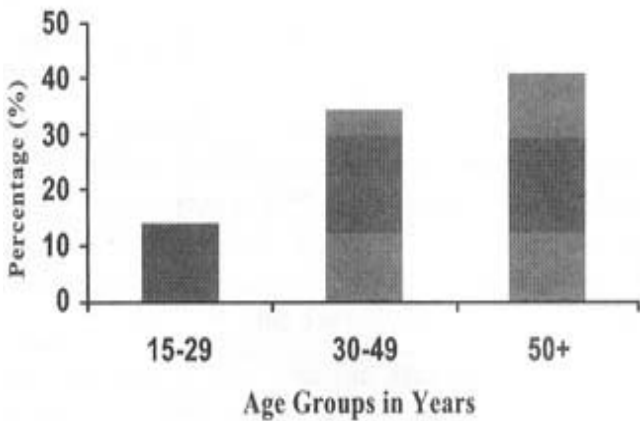


Figure 1. Relationship of Hypertension with Age.

Table. Association of Hypertension and Diabetes.

Diabetes	Hypertension		Total
	Yes	No	
Yes	13 (28%)	6 (4%)	19 (9.5%)
No	33 (72%)	148 (96%)	181 (90.5%)
	46	154	200

Odds Ratio: 9.72 (CI= 3.1-33.1);  $p < 0.001$

There is a strong association between diabetes and hypertension as shown in the table. Hypertensives are 9.7 times more likely to be diabetics as compared to normotensives in this study ( $p < 0.001$ ).

On analyzing relationship of hypertension with other variables, no significant difference was noticed for education ( $p = 0.68$ ), smoking status ( $p = 0.46$ ), family history ( $p = 0.31$ ) and occupation ( $p = 0.27$ ).

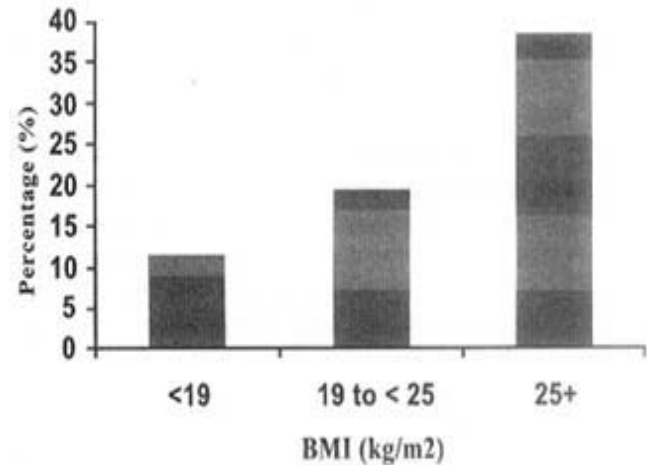


Figure 2. Relationship of Hypertension with BMI.

### Discussion

Hypertension is one of the major factors contributing to atherosclerotic heart diseases. The patient should be labeled hypertensive ideally after recording of multiple readings on different occasions several weeks apart. The blood pressure was recorded once in the study sample and for confirmation, referred to the PHC center. Therefore, the results are more towards identifying the risk factors or screening those prone to be hypertensives.

The overall prevalence of hypertension in this study was 15% with 17.5% in males and 14% in females. Studies done in low socioeconomic areas of Punjab and Karachi (Pakistan) showed a prevalence of 5% and 17% respectively.<sup>8,9</sup> Comparing the study done in another squatter settlement of Karachi revealed a prevalence of 26% with males (34%) and females (24%).<sup>10</sup>

The observations regarding the age group of hypertensives in this study is well compared with the fact that hypertension increases with age. The NHSP showed that prevalence of hypertension for females is lower than for males at younger ages and then crosses over, exceeding that of males after 35-44 years of age.<sup>4</sup> Obesity and diabetes mellitus are regarded as a modifiable risk factor for hypertension. A study done in Punjab showed similar results to this study. The subjects having BMI  $> 27$  had a higher prevalence of hypertension (48%) and a higher prevalence of

hypertension in diabetics.<sup>11</sup>

Education has no effect on the awareness of people regarding hypertension is evidenced in a study done in Italy.<sup>12</sup> This is again consistent with this study where no association was found between education and being hypertensive.

Another study done in an Islamic country revealed that smoking habit was less frequent among hypertensives, probably due to attending smoking prevention programs.<sup>13</sup> In our study there was no association between hypertension and smoking. The limitation of our study was that it was conducted during morning hours, when most adult males are on their jobs. This led to less representation of males in the final sample.

Prevention and control of hypertension is essential as the life expectancy is increasing, the probability of chronic diseases will be on the rise especially in the elderly with co-existing morbidity. The main emphasis according to this study should be on controlling the BMI through weight reduction and regular exercises. The general population should also be encouraged to have their blood pressures monitored regularly after thirty years of age. Awareness among the population is needed to decrease the double burden on the society.

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