PREVALENCE OF HYPERTENSION IN THE ADULT POPULATION OF MINGORA CITY, DISTRICT SWAT

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ABSTRACT:

Background: The dramatic increase in the prevalence of hypertension and its complications are associated with significant health and financial burdens, warranting strong and comprehensive prevention efforts. The objective of the present study was to evaluate the prevalence of hypertension in the adult population of Mingora city, district Swat.

Methodology: In the present study, both male and female between 21-50 years of age were included. The prevalence of hypertension was detected in 200 subjects. One hundred subjects were selected to compare the anthropometric and cardiovascular parameters of hypertensive subjects with control group.

Results: The prevalence of hypertension in male subjects was 14.45 % and that in female subjects was 15.56 %. Hypertensive subjects had significantly higher weight, body mass index, and both systolic and diastolic blood pressure values, as compared to control group.

Conclusion: Persistently elevated blood pressure level is more frequent in the 4th and 5th decades, especially among female subjects with higher body mass index.

Keywords : Weight (Wt), Height (Ht), Body mass index (BMI), Blood pressure (B.P). Mingora

INTRODUCTION

Blood pressure is dependent on peripheral vascular resistance and cardiac output. Whereas hypertension is the result of another disease process, refers to as secondary hypertension. When no identifiable cause can be found, it is referred to as primary or essential hypertension. Many factors, including heredity, diet, stress, and obesity, may play a role in the development of essential hypertension¹.

Numerous reports, based on epidemiologic and demographic data, have pointed to the relationship between sodium intake and hypertension. It seems likely that increased salt intake may be contributory but not sufficient cause for hypertension².

In adult population, hypertension is usually defined as blood pressure level that exceeds 145-150/ 90-95 mm Hg³. Systemic hypertension occurs commonly in adults and if untreated is a major risk factor for myocardial infarction, stroke and renal failure. The prevalence of hypertension increases

with age: 15% in young adults to 60% in individuals older than 65 years¹.

It has been reported that subjects with family history of essential hypertension showed a stronger increase of systolic blood pressure with age, suggesting that they are likely to develop essential hypertension at a younger age than subjects without such a genetic susceptibility⁴.

It is clear from familial and longitudinal studies of blood pressure that there is a link between genetic and environmental influences on blood pressure during childhood and the development of essential hypertension⁵. The mechanisms leading to hypertension in obese persons are not completely known. It is hypothesized that increased sympathetic nervous system activity, insulin resistance and hyperinsulinemia, sodium retention, and enhanced vascular reactivity are involved in the development of hypertension. Some investigators have reported a decrease in plasma renin activity and plasma aldosterone levels after weight loss; this suggests that the

renin-angiotensin-aldosterone axis may play a role in causing hypertension in obese persons⁶.

Mounting evidence shows that elevated heart rate measured in resting condition is associated with an increased risk of developing hypertension and atherosclerosis. It is important to note that sympathetic overactivity seems to be responsible for the increase in both heart rate and blood pressure, and also for metabolic disturbances, such as being overweight⁷.

Switty et al, reported that the systolic and diastolic blood pressure showed a positive correlation with age, weight, height and surface area. There was no difference in systolic blood pressure for both sexes of corresponding age, while there was difference in diastolic blood pressure³.

Sex and race have significant independent relationship with hemodynamic determinants of blood pressure in children and adolescents. After control for the effect of body size, male subjects had higher heart rate and cardiac out put and female subjects had increased peripheral vascular resistance. White subjects had higher stroke volume and cardiac out put, and black subjects had higher peripheral vascular resistance⁸.

Among cardiovascular diseases, hypertension has been the most discussed topic for its role as the risk factor of coronary heart disease and stroke⁹.

The objective of the present study was to assess the prevalence of hypertension and to examine its associations with anthropometric and cardiovascular parameters in the adult population of Mingora city, district Swat. Further, to evaluate more accurately the current status, screening, awareness, and control of hypertension.

SUBJECTS AND METHODS:

Two hundred subjects were randomly selected from different union councils of Mingora city. Prevalence of hypertension was detected. Hundred subjects, 50 control (normotensive) and 50 hypertensive (age and sex matched) were selected for the assessment of the relationship of

anthropometric parameters with cardiovascular parameters.

Both male and female adults between ages 21-50 years were included in the study.

Subjects having a medical history of disease other than overweight/ hypertension or were taking any medication known to affect metabolism were excluded from the study.

Health Scale was used to measure weight and height. Weight was assessed at 2 different points during interview, and the 2 were averaged for these analysis. It was measured to the nearest 0.5 kg. Participants were advised to wear normal clothing without shoes, socks, and belts. Height was also assessed at 2 different points during interview, and the two readings were averaged for these analyses. It was measured to the nearest 0.1 cm¹⁰.

Body mass index (BMI) was determined by dividing weight (wt) in kilogram by height (ht) in meters squared ($BMI = kg/m^2$). In adults, average body mass index >27.8 in men and >27.3 in women were used to determine obesity¹¹.

Blood pressure data was obtained, after at least 5 minutes of rest, with subjects in seated position. A mercury sphygmomanometer, with an appropriate sized cuff covering two third of the upper arm, was used. The onset of the first tapping sound was taken to indicate the systolic blood pressure, while the point of complete disappearance of the Korotkoff V sound was taken to indicate diastolic blood pressure. The mean of three reading was recorded¹².

RESULTS

TABLE I: Tabulated presentation of prevalence of hypertension in male subjects

Age group (years)	Age (mean)	Systolic BP (mmHg)	Diastolic BP (mmHg)	Prevalence
21-30 (n=33)	25.5 ± 2.93	117 ± 19.20	78 ± 9.60	13.34 %
31-40 (n=33)	35.5 ± 2.93	129 ± 15.14	83 ± 9.17	13.34 %
41-50 (n=34)	45.5 ± 2.93	135 ± 13.68	84 ± 8.73	16.67 %

Values were given as mean SD

Graph I: Graphic presentation of prevalence of hypertension in male subjects

Table I & Graph I: Show prevalence of hypertension in male subjects. The prevalence of hypertension for men with age 21–30 years (25.5 2.93) was 13.34 %, for men with age 31–40 years (35.5 2.93) was 13.34 %, for men with age 41–50 years (45.5 2.93) was 16.67 %. The values were expressed as mean SD (standard deviation).

TABLE II Tabulated presentation of prevalence of hypertension in female subjects

Age group (years)	Age (mean)	Systolic BP (mmHg)	Diastolic BP (mmHg)	Prevalence
21-30 (n=33)	25.5 ± 2.93	121 ± 24.78	77 ± 13.57	10 %
31-40 (n=33)	35.5 ± 2.93	131 ± 15.23	83 ± 8.99	16.67 %
41-50 (n=34)	45.5 ± 2.93	140 ± 15.70	88 ± 10.55	20 %

Values were given as mean SD

Graph II: Graphic presentation of prevalence of hypertension in female subjects

Table II & Graph II: Show prevalence of hypertension in female subjects. The prevalence of hypertension for women with age 21–30 years (25.5 2.93) was 10 %, for women with age 31–40 years (35.5 2.93) was 16.67 %, for women with age 41–50 years (45.5 2.93) was 20. The values were expressed as mean SD (standard deviation). As shown in the tables & graphs above, the prevalence increased with increase in age and still more in male than female till the age of 30–35 years. After 35 years, the increase in prevalence was higher in women than men.

Table III: Tabulated presentation of anthropometric and cardiovascular parameters of hypertensive subjects. compared with control group

S. No	Parameters	Control group n = 50	Hypertensive Subjects n = 50
1	Weight (Kg)	66 ± 7.25	87 ± 8.12 **
2	Height (M)	1.66 ± 0.08	1.64 ± 0.05
3	BMI (kg/m ²)	24 ± 1.29	32 ± 2.41 **
4	Heart rate b.p.m.	72 ± 6.5	100 ± 7.4 **
5	Systolic B.P mmHg	125 ± 11.8	160 ± 8.27 **
6	Diastolic B.P mmHg	80 ± 10.99	105 ± 6.79 **

Values were given as mean SD * p 0.05 (significant) ** p 0.001 (highly significant) when hypertensive were compared with control group.

Graph III: Graphic presentation of anthropometric and cardiovascular parameters of hypertensive subjects compared with control group.

Table III & Graph III: Anthropometric and cardiovascular parameters of hypertensive subjects "A" were compared with control group "B". The mean weight of group "A" was 87 8.12 and that of group "B" was 66 7.25. The p-value was 0.001 (highly significant). The mean height of group "A" was 1.64 0.05 and that of group "B" was 1.66 0.08. The height difference was not significant. The mean BMI of group "A" was 32

2.41 and that of group "B" was 24 1.29. The p-value was less than 0.001 (highly significant).

The mean heart rate of group A was 100 7.4 and that of group "B" was 72 6.5. The p-value was 0.001 (highly significant). The mean systolic blood pressure of group "A" was 160 8.27 and that of group "B" was 125 11.8. The p-value was 0.001 (highly significant). The mean diastolic blood pressure of group "A" was 105 6.79 and that of group "B" was 80 10.99. The p-value was 0.001 (highly significant). The values are expressed as mean SD (standard deviation).

DISCUSSION

Hypertension is the commonest cardiovascular disease in Africans occurring in more than 15% of the adult population in some studies. Andrew et al, observed almost similar results to the present study and reported that the age-adjusted prevalence of hypertension in people aged 15 years or more was 13.9% in men and 16.3% in women rural community of Mamre, located in the Western Cape, South Africa¹³.

While Maier et al, reported higher prevalence rates than the present study. It was 27.6% in North America, compared with 44.2% in Europe (55% in Germany ranging down to 38% in Italy). There was little evidence that BMI values played a role in these differences in hypertension - the average BMI was 27.1 in North America, and 26.9 in Europe. The present study is not agreed with the above findings, which observed significant relationship of BMI with hypertension¹⁴.

Zadegan et al, reported that the crude prevalence for definite hypertension in Isfahan, Islamic Republic of Iran was 28.6%, 38.9% and 34.8% for men, women and the entire population respectively. While age-adjusted (19 years) prevalence of hypertension was 16.8%, 19.4% and 18.0% for men, women and whole population respectively. The present study is in disagreement with the higher prevalence rates reported, while it is in agreement with the findings that the prevalence of hypertension increased with age in both sexes and women had a lower prevalence only

in the third decade¹⁵.

The present study is in agreement with the results of the study conducted by Pedro et al, who confirmed the association of body mass index (BMI) with blood pressure (BP) in the urban Mexican adult population. Several distinctive features were worth commenting on: (1) with increasing age, a higher prevalence of hypertension in both sexes was observed; (2) lower rates of hypertension in women than in men were found in the age bracket of 20 to 39 years; (3) women attained a similar prevalence of hypertension than men in the fourth and fifth decades of life; and (4) women showed higher prevalence of overweight than men did in most age categories¹⁶.

From 1999 to 2009 the death rate from high blood pressure increased 17.1 percent, and the actual number of deaths rose 43.6 percent¹⁷.

Studies of obesity in Asian subjects show that generalized obesity is the major determinant of cardiovascular risk in the Chinese and East Asian subjects, while central obesity is associated with greater cardio-vascular risk in South Asians¹⁸.

Most of the studies found adolescent or preadolescent children with higher BMI to be at higher risk for hypertension.¹⁹ The economic transition has increased the availability of food and purchasing power which has resulted in overnutrition in neo rich populations leading to overweight, obesity and many life style disorders²⁰.

In conclusion, the results of this study demonstrate that the prevalence of hypertension increases with age. The prevalence of hypertension is higher in males than females up to the age 35 years, while after 35 years it is higher in females than males. Obesity index such as BMI, is closely related to both systolic and diastolic blood pressure. And increase in prevalence of hypertension may partly be attributable to the increase in prevalence of obesity.

Thus, it is concluded that different cultural norms

and standard for appropriate body size might contribute to the disparity in obesity and hypertensive rates among different populations and countries.

The findings of this study suggest that intervention should begin in the first years of school because obesity and hypertension appear to be well established by then. Hypertension is the most prevalent cardiovascular disease, and it is one of the most powerful contributors to cardiovascular morbidity and mortality. Data on the prevalence of hypertension and the mean levels of systolic and diastolic blood pressure and accompanying risk factors are helpful in planning primary preventive strategies.

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