

PREVALENCE OF OBESITY IN PATIENTS WITH ESSENTIAL HYPERTENSION OF VARYING SEVERITY

Pages with reference to book, From 354 To 357

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Abstract

Five hundred patients with essential hypertension of varying severity were reviewed for ponderal index values. They were divided into 4 grades, i.e., mild, moderate, moderately severe and severe according to the level of diastolic blood pressure. The prevalence of obesity in the overall group was 56.2%. The mean ponderal index values in various groups did not show any significant difference. Hypertensives with diabetes mellitus who comprised 23.4% of all the patients did not materially affect the prevalence of obesity amongst hypertensives (JPMA 35 : 354, 1985).

INTRODUCTION

Large scale prospective studies in United States have shown an association between obesity and elevated blood pressure.^{1,2} It has been observed that obesity is more prevalent in hypertensives, normotensive obese subjects are more likely to develop hypertension and changes in weight are associated with similar directional changes in blood pressure. Impressive reduction in blood pressure in obese hypertensives has also been recorded after weight loss without salt restriction³. These observations show that the control of obesity is one of the potential points of intervention in hypertension.

The prevalence of obesity in Pakistani patients with hypertension is not well documented. Also, patients with essential hypertension form a heterogeneous group with different-grades of severity and variable response to drugs. Whether patients with mild, moderate or severe grades of essential hypertension are part of a continuous spectrum or have some differences in various characters is not clear.

In this study, the prevalence of obesity in patients with essential hypertension of varying severity attending the 'Hypertension Clinic' is reported.

MATERIAL AND METHODS

The records of 500 patients with essential hypertension attending the Hypertension Clinic from 1972-1977 were reviewed for weight and height at the time of registration. A standard size cuff was used to measure the blood pressure in all the patients. Ponderal index was calculated according to the formula : $\text{Height (inches)}^3 / \text{Weight (lbs.)}$. Those with a ponderal index below 12 were designated as obese.

The severity of hypertension was assessed according to the level of diastolic blood pressure.⁴

RESULTS

According to severity of diastolic blood pressure mild hypertension was present in 294 (58.8%); moderate in 146 (29.2%); moderately severe in 48 (9.6%) and severe in 12 (2.4%) patients.

Table I

Mean Values of Age & Ponderal Index.

Grades of Hypertension	No. of patients	Age (years) Mean $\pm$ S.D.	Ponderal Index Mean $\pm$ S.D.	Number and percentage of obese patients.
1. Mild	294	46.92 $\pm$ 11.51	11.86 $\pm$ 0.82	168 (57.14%)
2. Moderate	146	48.50 $\pm$ 10.81	11.92 $\pm$ 0.84	86 (58.90%)
3. Moderately severe	48	45.90 $\pm$ 10.39	11.96 $\pm$ 0.76	23 (47.92%)
4. Severe	12	48.33 $\pm$ 11.99	12.12 $\pm$ 1.22	4 (33.33%)

Table 1 shows the mean values of age (years) and ponderal index in patients with hypertension of varying severity. There was no statistical difference in age and ponderal index in various groups of hypertensives. The prevalence of obesity (ponderal index <12) in different groups of hypertensives was as follows: moderate 58.90%, moderately severe: 47.92%, severe: 33.33%. In the overall group 281 patients (56.2%) were obese. This prevalence rate of obesity amongst hypertensive is statistically significant (S.E. of difference between two proportions).

Table II

Mean Ponderal Index Values in Diabetic and Non-diabetic Patients with Hypertension.

Grade of Hypertension	Diabetic, =patients n = 142		Non-diabetic patients n = 358		Statistical significance
	No. of Patients	Ponderal index Mean $\pm$ S.D.	No. of Patients	Ponderal index Mean $\pm$ S.D.	
1. Mild	96	11.67 $\pm$ 0.74	198	11.96 $\pm$ 0.84	P $<$ 0.02
2. Moderate	38	11.75 $\pm$ 0.76	108	11.98 $\pm$ 0.87	N.S. *
3. Moderately severe	6	11.78 $\pm$ 0.53	42	11.99 $\pm$ 0.79	N.S. *
4. Severe	2	11.41 $\pm$ 1.41	10	12.31 $\pm$ 1.16	N.S. *

N.S. * = Not significant.

Table II shows a comparison of ponderal index values in diabetic and non-diabetic hypertensives. The distribution of diabetics in various groups of hypertension was Mild : 96 (32.65%); Moderate: 38 (26.03%); Moderately severe 6 (12.5%) and severe : 2 (16.6%). In the group with mild hypertension, the diabetics had a slightly lower ponderal index (P $<$ 0.02) than the non-diabetics. In all other groups, there was no statistical difference in the mean ponderal index values between diabetic and non-diabetic hypertensives.

When the percentage prevalence of obesity in diabetics and non-diabetics was compared in each group, the difference was not significant (Table III).

Table III

Prevalence of Obesity in Hypertensive Diabetics and Non-diabetics.

Severity of Hypertension	Diabetic obese patients		Non-diabetic obese patients		Statistical significance
	No.	Percentage	No.	Percentage	
1. Mild	62 (96)*	64.58	106 ((198)**	53.54	$P > 0.10$
2. Moderate	22 (38)*	57.89	64 (108)**	59.26	$P > 0.45$
3. Moderately severe	4 (6)*	66.67	19 (42) **	45.24	$P > 0.30$
4. Severe	1 (2) *	50.00	3 (10) **	30.00	$P > 0.45$
Total	89	62.68	192	53.63	$P > 0.10$

* Number in parenthesis denote total diabetic in each group.

** Number in parenthesis denote total non-diabetic in each group.

DISCUSSION

Present study has the limitation of being entirely hospital based. We used the standard size cuff in all patients which could lead to an over-estimation of blood pressure in obese individuals. However, studies elsewhere have shown that the mean increase in blood pressure in obese individuals using the standard cuff is about 12 mm.^{5,6} These studies included some very obese individuals and in moderate obesity the elevations were not much.

The range of blood pressure elevation in our patients was large, and the upper limit of mild blood pressure was arbitrarily fixed at 110 mm blood pressure was arbitrarily fixed at 110 mm Hg diastolic. A vast majority of patients with mild hypertension had diastolic blood pressure of 100 mm and above. None of the individuals were grossly obese. It is therefore unlikely that any significant number of obese persons with 'normal' blood pressure would have been included. It is, however, desirable in such studies to have large size cuffs available for use, as suggested by Tobian⁷. However, it confirms the impression that a higher proportion of hypertensives seen in clinical practice are obese. When patients with essential hypertension are divided into groups according to the severity of diastolic hypertension, the mean ponderal indices did not differ significantly in these groups.

Diabetics are generally more obese, and in our group there were 142 (28.4%) diabetics who had associated hypertension. To assess the effect of inclusion of diabetic patients, the mean ponderal index in diabetic and nondiabetic patients in each group were compared. Except in the group with mild hypertension, in which diabetics had a relatively lower ponderal index ($P < 0.02$), no significant difference was noted in other groups. The prevalence of obesity amongst diabetics and non-diabetics in each group showed no significant difference.. Thus, on overall evidence, the inclusion of diabetics did not materially affect the prevalence of obesity amongst the hypertensives.

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