

Prevalence and Interrelationship of Obesity in Hypertension

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ABSTRACT

Aim: To evaluate recognized parameters as obese or central obese and divided into groups.

Methods: The study has been conducted in OPD of Medical Department of Pak Red Crescent Medical & Dental college and hospital which is located in rural area of Punjab Pakistan. Young patients in age group of 18-40 years with hypertension were selected. Fifty three patients without any known complication of hypertension were selected. The patients groups were made and obese patients were separated from non-obese in the form of tables and the results are noted.

Results: Obesity was found in large proportion of observed groups of hypertension and it was noted in 60% of cases. The obese patients were with higher BMI range in males and females.

Conclusions: The obesity with hypertension in young our rural population is an alarming situation and the international and national evidences showing the interrelationship of the two conditions by certain mechanisms make it a matter of national health consideration.

Keywords: Obesity, hypertension, rural area

INTRODUCTION

Obesity and hypertension are prevalent in a large number of studies all over the world¹. Each of them independently and many a times in correlation are responsible for atherosclerosis and hence result in cardiovascular, neurovascular, renal and metabolic complications^{1,2}. Adipose tissue is in three different forms i.e. white, brown and beige forms and is located as subcutaneous tissue, abdominal (consists of perivascular which may decrease with lesser calorie intake and visceral fats which has cushion like effect only on internal organs and is not affected by calorie intake) and perivascular compartment fats located around vessels. Brown adipose tissue in contrast to white adipose tissue has been found comparatively lesser in central obesity and so is associated with other metabolic disorders such as hypertension³. Brown adipose tissue contains a lot of mitochondria and is responsible for thermogenesis and does not take part in hormonal and protective effect^{4,5}. PVAT is morphologically similar to brown adipose and also for its thermogenic effect, however it is different in different vessels phenotypically and developmentally⁶. Decreased vascularity in adipose tissue due to obesity brings about whitening of brown fat to white⁷. Fat distribution in obesity is of three forms i.e. visceral and peripheral and also in third compartment as perivascular adipose tissue which is 3% of total body adipose tissue⁸. It has been noted in many studies that visceral adipose tissue secretes certain proinflammatory factors as IL6 and tumour necrotic factor which cause insulin resistance and also endothelial dysfunction and may cause cardio metabolic effects^{9,10,11,12}. Also the visceral fat also activates sympathetic nervous system but mechanism is not explanatory¹³. This perivascular adipose tissue releases certain

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Substances such as adipocyte derived releasing factors which carry on normal homeostatic vascular function¹⁴. In certain vascular pathologies such as aging and adiposity there is a change in the molecular and cellular responses of this tissue are reversed so release of vasotonic affects are reversed and there is release of other factors as leptin IL6 and TNF alpha which may taken while result in vascular inflammation and leads to hypertension and other metabolic effects^{15,16} so it is the change of brown adipose tissue content to white adipose tissue which is responsible for cardio metabolic effect and /or the special characteristics pathology due to aging and obesity of perivascular adipose tissue which might be responsible for hypertension and metabolic syndrome like effects. In the present study we have tried to find the presence of obesity in hypertension cases and also to compare the number of patients with obesity and no obesity with hypertension so as to know the coexistence of these two conditions together which may be etiologically related at least in some cases.

MATERIALS AND METHODS

The young patients in the age group of males and females with minor ailments and not suffering from cardiometabolic diseases were selected in OPD attending Red Crescent Medical and Dental College. These patients were in age group of 18 to 40 years and not on any medication. The patient's blood pressure was taken while they were seated for at least 15 minutes and not taken any tea or coffee neither they were on any drugs. Blood pressure is taken as by JNC 8 criteria with mercury manometer instruments in both arms and the one on higher side was considered¹⁷. The patient was seated with back support and arms are lying on table at heart level. The

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patients were considered hypertensive when BP was at or higher than 140/90mmHg.

The patients weigh height and waist circumference (80cm for women and 90cm for men) were noted and BMI calculated (23.5 for women & 24.9 for men) the patients with increased waist circumference but normal BMI were considered as having centralobesity^{18,19}. Two patients were fully examined .their general physical and systemic examination performed urinalysis, RFT Performed to rule out any secondary form of hypertension. 3the patients weightsand heights were noted .and waistcircumference were noted.4 the selected patients were included in study

RESULTS

The results are computed as following. The total cases in hypertension selected as per criteria are 32 males and 21 females.

Table 1: Demography of in hypertension casesin age group 18to 40 years

sex	No of cases	%age
males	32	60%
females	21	40%
total	53	100%

Table 2: Hypertension cases with obesity& no obesity

Gender	HTN	HTN & Obese	HTN & Non obese
Male	32	20(62.5%)	12(37.5%)
Females	21	15(71%)	6(29%)
total	53	35(66%)	18(34%)
Probability(total)		60%	40%

Thepatients with obesity and hypertension are separated from non-obese and they are 20/32(62.5%) in males and 15/21(71%) in females in obese group as compared to 37.5(12/32) in males and 6/21(29%) in females.In total obese with hypertension in males and females are 66%as compared to 34 %in non obese and hypertension group in males and females collectively. So probability of obesity in combined males and females is 60%as compared to non obese subjects as 40%.

DISCUSSION

Obesity has been observed as one of the important predisposing risk factors in hypertension in many studies world wide^{1,20}. Many different pathophysiological mechanisms were studied in many studies²¹.Obesity has also been observed as a major component in studies on cases with metabolic syndrome in Pakistan and international sutdies^{22,23}. In the present study over findings correlate with international and national studies.

CONCLUSION

Our present study shows the higher prevalence of obesity along with hypertension in our rural population .so a health programme for nutrition education of our population is needed to avoid the obesity & hence the devastating complications associated with it.

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