ORIGINAL ARTICLE

Prevalence of Metabolic Syndrome in Hypertension patients in rural population in adult's age group of 18 to 35 years

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ABSTRACT

Aim: To find the prevalence of metabolic syndrome in hypertension cases(males and females) in rural area
Place & duration of study: The study was conducted in Pakistan Red Crescent Medical & Dental College Dina Nath in a subset of rural area patients visiting the hospital during the period of 15/1 /2018 to date.
Study: A cohort study
Methods: Forty hypertension cases in the age group of 18-35 years with minor medical ailments & without any underlying pathological conditions (endocrinal /renal causes of hypertension or h/o intake oral contraceptive pills) were evaluated as per Performa by physical examination and laboratory investigations and were selected for study. The patients' height, weight BMI, waist circumference and waist/hip circumference were taken.
Results: The prevalence of metabolic syndrome was found to be 35 % in male & female cases of hypertension. the prevalence of certain factors of metabolic syndrome are significant on chi square test in positive cases.
Conclusion: The patients with hypertension in younger ages must be evaluated for metabolic syndrome factors as these factors independently also increase the atherosclerosis risk & should be treated as well.
Keywords: Metabolic syndrome, dyslipidemia, obesity.

INTRODUCTION

Hypertension is prevalent in nearly one third (4-78%) population of the world. It is one of major risk but most modifiable risk factors for atherosclerosis[1]. There is an increase in tendency of hypertension patients in last decade perhaps due to a number of factors as age, gender, obesity, smoking, physical inactivity h/o intake of oral contraceptives &excessive salt intake and racial components[1]. The prevalence of hypertension in overweight persons in different populations of world is well recognized in young and old populations[2,3]. The association of obesity with hypertension is more associated with increase in waist / hip ratio girth than for measurement of body mass index[4]. In the presence of obesity the underlying mechanism for development of hypertension& obesity is impairment of renal pressure natriuresis by activating renin angiotensin system and a reduction in sympathetic activity. The blood pressure lowering effect in reducing weight is due to increase in insulin sensitivity (4).Perivascular adipose tissue inflammation release cytokines[5] induce insulin resistance in both tissue & muscle[6] in vascular disease leads to vascular inflammation & may lead to hypertension diabetes mellitus & atherosclerosis[7,8]. The insulin resistance plays a key role in pathophysiology of metabolic syndrome.[9]The metabolic syndrome predicts a twofold increase in cardiovascular disease[10]. The clustering of risk factors already exist in childhood[11] and remains present in adulthood[12]. Insulin resistance & obesity are considered as major causes. Metabolic syndrome is prevalent in newly diagnosed hypertensive patients[13]. When hypertension & other metabolic risk factors coexist in a person they potentiate one another and increase total cardiovascular disease risk in a synergistic way and increase total cardiovascular risk well above that which results from sum of individual risk factors[14].

The aim of our study is to find prevalence of metabolic syndrome in younger patients in a rural set up in Pakistan.

PATIENTS & MATERIALS

The outdoor patients with minor complaints and no h/o diabetes mellitus, or any other complaints pointing to any pathological condition as endocrinal /renal disorder or h/o of drug/alcohol induced hypertension and who were found hypertensive on general physical examination as per JNC 8 criteria (blood pressure more than 140/90 mm Hg) or already diagnosed as hypertensive a little time ago in age group of 18 -35years were evaluated further for inclusion in study by following criteria.

General physical examination: the patient s blood pressure readings were taken by standard Germany made mercury sphygmomanometer on the non-dominant arm when the patient remained seated for at least 5 minutes. Resting systolic & diastolic pressure is taken as mean of two measurements[15], weight, height, body mass index Abdominal Girth /hip ratio were taken[16]. Thyroid examination performed, history of cigarette smoking were taken.

Systemic review: Patients were examined systemically to rule out any systemic abnormality.

Laboratory Investigations: The patients fulfilling the above criteria are then investigated for renal function tests, Urinalysis and fasting blood sugar levels to rule out any other pathology.

Finally the 40 patients selected were further investigated for fasting serum lipid profiles S. Cholesterol, S Triglyceride**,** HDL cholesterol LDL cholesterol as per NECP ATP 111 &ID Programs.[17] the patientsare evaluated. The metabolic syndrome is present if 3 of 5 factors as blood pressure over 130/85 2, waist circumference of >102

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cm oin men & 88 cm in women 3, triglyceride levels > 150 mg /dl. 4 HDL.C < 40 mg /dl 5.Fasting blood sugar > 100 mg /dl are positive[16].

RESULTS

In our study we found prevalence of metabolic syndrome in hypertensive cases are 34.8 %. We did not find any profound difference in male & female(35.8 and 35.3 respectively) cases.

Table 1: Data of patients in age range of 18-35 years

0hypertension patients	Male (n=23)	Female (n=17)	Total (n= 40)	Preval-ence
overweight/abdominal girthmales>102cm in females<88cm in	12	10	22	55%
Fasting HDL-C <40mg in male&<50 in female	8	6	14	35%
High FBS >100mg/dl	8	6	14	35%
High triglyceride> 150mg/dl	13	9	22	55%

Table 2: Prevalence of combined lipid abnormalities

Htn[1] + centrally obese	Male (n=12)	Female (n=10)	Total (n=22)	Preva-lence 55%[2]
Htn + centrally obese raised FBS	6	5	11	27.5%
Htn + centrally obese+ raised TG	8	5	13	32.5%
Htn +centrally obese+ low HDL-C	6	5	11	27.5%

Table 3: Patients with Metabolic syndromes according to Adult Treatment Panel 111 Criteria (at least 3 out of 5 positive factors)

Diagnosis by ATP 111 Criteria	Male (n=23)	%age	Female (n=17)	%	Total (n=40)	%age
Metabolic syndrome	8	35.8	6	35.3	14	34.8
No Metabolic syndrome	15	65	11	65	26	65

Also the prevalence of central obesity & triglyceride levels were found much higher in patients with metabolic syndrome (100% & 91% respectively) however these factors were found independently higher in other hypertensive cases which were not fulfilling the criteria of metabolic syndrome. The prevalence of fasting hyperglycemia low HDL-C was found each in 78% patients with metabolic syndrome as compared to 14 % in those without this condition. All these findings have been described in tabular forms. In table 1 the abnormalities have been described in all the patients (males and females) of hypertension individually. In table 2 the combined abnormalities of certain factors described.in table 3 the patients with metabolic syndrome and without the condition are compared. In table 4 probability of different factors in metabolic syndrome were calculated & found significant.

Table 4: Frequency of different factors in positive & negative metabolic syndrome cases

Different factors of metabolic syndrome.	Metabolic syndrome +ve No 14	Metabolic syndrome -ve No 26
overweight/abdominal girth males>102cm in females &<88cm in	14(100%)	6(14%)
Fasting HDL-C <40mg in male&<50 in female	11(78%)	(3(14%)
High FBS >100mg/dl	11 (78%)	3(14%)
High triglyceride>150mg/dl	13(91%)	9(22%)

Chi-square [X^2]: 12.4 Probability :Highly significant

DISCUSSION

In our study we found prevalence of metabolic syndrome in hypertensive cases are 35 % of cases. There was not found much difference in male & female cases. Also the prevalence of central obesity & triglyceride levels were found much higher in patients with metabolic syndrome (100% & 91 % respectively) however these factors were found independently higher in other hypertensive cases which were not fulfilling the criteria of metabolic syndrome. The prevalence of fasting hyperglycemia low HDL-C was found each in 78% patients with metabolic syndrome as compared to 14 % in those without this condition. The association of hypertension with dyslipidemia, obesity, high fasting blood sugar has been described in Pakistani & worldly publications Dyslipidemia in hypertension has been reported in a large study of of 1440 patients in 82.6% patients.[18]Inmulticenter study on the association of obesity & hypertension the obesity & hypertension were well established[19]. In Framingham Offspring studies followed for 8 years showed that obesity contributes to hypertension in 78% of men &68% of women in age group of 20 to 49 years[3].The association of between being overweight or obese with hypertension is more associated with increase in waist / hip ratio girth than for measurement of body mass index[4]**.** In a study obesity was found in nearly 40% of newly diagnosed hypertension cases was found[19]. In a study on Pakistani population the association of dyslipidemia in hyperglycemic patients were well described. In the study on 200 diabetic patients including 120 males & 80 females dyslipidemia was found in 97.15% of males& 87.15 % in females. The most prevalent pattern was mixed combined dyslipidemia was 51.25% in females while it was 47.5% in males. The combined pattern was low HDl –C and high triglyceride levels[19].Metabolic syndrome is prevalent in newly diagnosed hypertensive patients In a cross sectional study in India where it was found to be in 44.5% on 200 patients (age>20 yrs) with hypertension. The metabolic syndrome was associated with 44% of patients with obesity (high waist circumference) 91.01 %, low HDL C in 40.5%,, abnormal triglyceride in 34%[6]. The study results corresponds well with the results of our study. However in our study obesity and triglyceride levels were found 100 percent and 91 % respectively. The difference may be because of eating hobbits in our rural areas for using more carbohydrates and fatty foods in their foods.

CONCLUSION

The higher incidence of metabolic syndrome in hypertensive patients is a matter of serious condition in our population especially in rural area and raises our concern for investigating lipid profile & sugar level so as to treat these abnormalities side by side hypertension.

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