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FREQUENCY OF THE METABOLIC SYNDROME IN ADULT DIABETIC PATIENTS THOSE VISITING TO CIVIL HOSPITAL KARACHI.

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ABSTRACT:-

OBJECTIVE: *To determine the frequency of the metabolic syndrome in adult diabetic patients those visiting to civil hospital Karachi.*
MATERIAL& METHODS:- *A descriptive study was conducted at the diabetes clinic of civil hospital Karachi from January to June 2007. One fifty four subjects having type 2 diabetes mellitus were included in the study. Frequency of metabolic syndrome was estimated according to the criteria proposed by International Diabetes Federation (IDF) diagnostic criteria for metabolic syndrome, with adoption of the Asian criteria for abdominal obesity.*
RESULT: *A total of 154 patients were included in this study; out of them 98 (63.6%) were female and 56 (36.4%) were male. Mean age of study population was 49.5 ± 9years ranging from 32-70 years. Metabolic syndrome found in 125 (81.1%) diabetic patients. Out of ninety eight female patients 89 (90.8%) had metabolic syndrome where as 36 (64.2%) of 56 males were having metabolic syndrome, that was statistically significant (p=0.001).*
CONCLUSION: *In our study the frequency of the metabolic syndrome was found significantly high, especially female were more affected than male in all respect, expect in hypertension.*

INTRODUCTION

Metabolic syndrome is defined as a condition characterized by a set of clinical criteria: insulin resistance, obesity, hypertension, and atherogenic dyslipidaemia.1
Gerald Reaven in1988 was the first scientist to name this cluster as syndrome X.2 In addition to general obesity, the distribution of body fat is independently associated with the metabolic syndrome in older men and women, particularly among those of normal body weight.3 Abdominal subcutaneous adipose tissue with expression of inflammatory cytokines is a potential mechanism linking obesity with its metabolic comorbidities.4 Peroxisome proliferators-activated receptors (PPARs) are ligand-acivated transcription factors that control glucose and lipid metabolism, as well as the inflammatory response. Thus PPARs appear good drug targets for the correction of the global risk profile that predisposes an individual to the cardiovascular diseases. 5, 6
Taken individually, each component of the metabolic syndrome is a well established risk factor for the atherosclerotic cardiovascular disease ASCVD. These factors act synergistically and increase the risk for ASCVD from two to three folds.7 With growing problem of obesity in the modern world, a high prevalence of metabolic syndrome is observed. Findings from the National Health and Nutrition Examination Survey (NHANES) in USA suggested an unadjusted and age adjusted prevalence of 21.8% and 23.7% among US adults respectively.8 The age adjusted prevalence in an Indian urban population was reported as 24.9%.9
The prevalence is higher among diabetics than non-diabetics and is reported as 70-80% among Caucasian type 2 diabetics.10,11 A study conducted in Indian urban population gives a prevalence of 76.3% among type-2 diabetics.12 Prevalence of diabetes in Pakistan is high and studies suggest that more than 12% of Pakistani adults above 25 years of age have diabetes.13 Rapid urbanization and acquisition of western life style have resulted in decreased physical activity and increased calorie intake; two of the major contributors towards the development of diabetes and metabolic syndrome.14 The exact prevalence of metabolic syndrome in Pakistan is not known, though United States census department has given an estimate of approximately 25% among general population.15 The recent Adult Treatment Panel (ATP III) guidelines have called specific attention to

the importance of targeting the cardiovascular risk factors of the metabolic syndrome as a method of risk reduction therapy. Since the presence of metabolic syndrome and diabetes together poses a greater risk for the development of ASCVD than either alone, it is important to know the prevalence and pattern of metabolic syndrome among diabetics. This is necessary for the effective prevention of ASCVD among this particularly high risk group. We conducted this cross sectional study to determine the frequency of metabolic syndrome in type 2 diabetic population

MATERIAL& METHODS

A descriptive study was conducted at the diabetes clinic of civil hospital Karachi from January to June 2007. One fifty four subjects having type 2 diabetes mellitus with different ethnic backgrounds of the country were included in the study. Frequency of metabolic syndrome was estimated according to the criteria proposed by International Diabetes Federation (IDF) diagnostic criteria for metabolic syndrome, with adoption of the Asian criteria for abdominal obesity (Table 1).

Specifically designed forms were used to collect the data. Informed consent was taken after fully explaining the procedure and objective of the study. Demographic and history of diabetes, ischemic heart disease and hypertension were recorded. World Health Organization (WHO) criteria were used for the diagnosis and classification of diabetes mellitus.11 Samples for blood glucose and serum lipid profile were taken after an overnight fast. Sitting blood pressure was measured with mercury sphygmomanometer, using the patient's right arm and after 10 minutes of rest. Two readings were taken and the mean was used for analysis.1Waist circumference was measured at the level of the mid point between the high point of the iliac crest and last rib on the sides and the umbilicus anatomy, using a tape measure with the person lightly clothed.

Data analysis was performed by using SPSS version 13.0.Descriptive statistics are presented as a percentage of the total number of the population. Cross tabulation was used to determine the relationship of different variables of the metabolic syndrome. Chi square test was applied for determination of P values. P value less than 0.05 was considered significant.

RESULT:-

A total of 154 patients were included in this study; in which 98 (63.6%) were female and 56 (36.4%) were male. Mean age

TABLE.NO1.
IDF Criteria for the diagnosis of Metabolic Syndrome.

According to the new International Diabetes Federation,**(IDF)** for a person to have the metabolic syndrome should have;

❖ **Central Obesity: Waist circumference men = 90cm & women=80cm.**

Plus any 2 of the following 4 factors:

- **Blood glucose fasting >100 mg/dl or known case of type 2 diabetes mellitus.**
- **Blood pressure > 130/85-mmHg or known hypertensive.**
- **Triglyceride > 150 mg/dl.**
- **HDL-C; men =40 mg/dl, women = 50 mg/dl.**

TABLE.NO2.
BASELINE CHARACTERISTICS OF ALL DIABETIC PATIENTS

Characteristics		Number of Patients	Percentage
Sex	Male	98	63.6%
	Female	56	36.4%
Age	Mean age of study population	49.5±9 years	
	Mean age of Male patients	49.1 ± 9.9 years	
	Mean age of Female patients	49.7 ± 8.6 years	
Age Group	< 40 years	28	18.18%
	40-49 years	46	29.87%
	50 & above	80	51.9%
Education status	Illiterate	76	49.3%
	Primary	26	16.9%
	Matriculation	44	28.6%
	Intermediate	4	2.6%
	Graduate & post graduate	4	2.6%
Occupation	House wives	84	54.6%
	In services	48	31.2%
	Businessmen/women	2	1.2%
	Jobless/Rtd. Men/women	20	13%
Duration of diabetes (in years)	Mean duration of study population	8±6.1 years	
	Mean duration of diabetes of male patients	8±6 years	
	Mean duration of diabetes of female patients	8±6.1 years	
Type treatment	Diet control	4	2.5%
	OHA	95	61.6%
	Insulin	35	22.7%
	Combination	20	13.2%

of study population was 49.5 ± 9years ranging from 32-70 years. The baseline Characteristics are mentioned in Table 2.

By applying IDF criteria of metabolic syndrome, it was found in 125 (81.1%) diabetic patients. Out of ninety eight female patients 89 (90.8%) had metabolic syndrome where as 36 (64.2%) of 56 males were fulfilled the criteria of the metabolic syndrome, that was statistically significant (p=0.001).

The comparison of various components of the metabolic syndrome in both sexes showed that central obesity was present in 90.8% in female and 64.2% in male patients, while hypertension was found in 71.4% & 63.3% male and female respectively. Ninety three percent female and 78.6% male were having low HDL level while hyper triglycerima was found in 77.55% & 71.4% female & male respectively.

DISCUSSION:-

The incidence of the metabolic syndrome is rising worldwide. This is partly due to a significant increase in the prevalence of obesity.16 The prevalence of obesity is rising in other developed and affluent countries and is now spreading to less affluent countries like Pakistan.[17] Obesity-related type 2 diabetes is also rapidly rising in prevalence, not only in west but also in Asians largely because of increased longevity and sedentary lifestyles.18, 19

We studied 154 patients with type 2 diabetes mellitus using IDF criteria of metabolic syndrome. The study estimated high frequency of metabolic syndrome in patients with type 2 diabetes mellitus, 81.1%. Studies conducted in other parts of the world estimated a prevalence of 70-80% among Caucasian type-2 diabetics [10] and 75.6% among Chinese population with type-2 diabetes mellitus. [20] An Indian population based study using the Caucasian criteria for abdominal obesity, gave a prevalence of 76.3% among type2 diabetics.[12]

Different studies report quite varied effects of gender on the metabolic syndrome in different populations. In USA, metabolic syndrome is more prevalent in white males than in females.[21] In American blacks, Mexican Americans, Korea, Iran, India, Oman, and Kinmen women had higher prevalence of the metabolic syndrome than men.[22-25] We observed that metabolic syndrome was more common in females with type-2 diabetes mellitus as compared to their male counterparts . The higher percentage is also reported in Nigerian women with type-2 diabetes mellitus.[26]The reason may be a relatively sedentary lifestyle of women, in this part of the world, due to religious and social barriers. Prevalence of metabolic syndrome rises as age advances. [26, 27]In our study metabolic syndrome was identified in 70% of patients above the age 40 years.

Finally, the prevalence of different risk factors in patients of both sexes with metabolic syndrome was studied. As all of the patients were diabetics, males and females were compared for the presence of abdominal obesity, hypertension, low HDL and high triglycerides levels that showed all component of metabolic syndrome were more in female than male expect hypertension that was more in men. In Kinmen, the most common abnormalities were high blood pressure in men and large waist circumference in women.[22]In western India, the prevalence of low HDL cholesterol was 90.2% in women and 54.9% in men.[24] Thus, it appears that low HDL cholesterol and large waist circumference are responsible for the high prevalence of metabolic syndrome in women in many populations.

CONCLUSION:

In our study the frequency of the metabolic syndrome was found significantly high, especially female were more affected than male in all respect, expect in hypertension. Obesity is a key element in causing the metabolic syndrome and this factor was also more prevalent in women. High density lipoprotein cholesterol was also found much lower in women. Therefore women are more prone to suffer from cardiovascular morbidity and mortality.

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