Frequency of metabolic syndrome in patients with newly diagnosed Type II Diabetes at DOW University Hospital, Karachi-Pakistan.

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ABSTRACT… Objectives: To determine the prevalence of metabolic syndrome in patients with newly diagnosed type 2. **Study Design:** Descriptive Cross Sectional study. **Setting:** Dow University Hospital. **Period:** October 2018 to January 2019. **Material & Methods:** A total 342 patients prevalence of metabolic syndrome in patients with newly diagnosed type II diabetes at Dow University Hospital, Karachi, Pakistan. Data was collected through a questionnaire which is designed to record the age, gender, BMI, FBS, Waist circumference, blood pressure, HDL and triglyceride level of newly diagnosed of diabetic patients. Frequency and percentages were calculated for these variables. SPSS version 21 was used to analyze the overall results. **Results:** A total of 342 new diagnosed diabetic were included in this study. 189 (55.26%) were males and 153 (44.74%) were females. The mean + SD of age was 48.21±9.28 years. The mean + SD of FBS was about 192±43 mg/dl with ranges from 98 to 482 mg/dl. The mean + SD of Serum TG was about 243±152 mg/dl with ranges from 189 to 325 mg/dl. The mean + SD HDL was about 38.9±9.23 mg/dl with ranges from 12 to 102 mg/dl. The mean + SD of waist circumference was about 110.5±11.90 cm. The mean + SD systolic & diastolic blood pressure was about 150 + 8.23 & 98 + 11.28 respectively. The mean + SD of BMI was 29.23+ 11.23. Metabolic syndrome was diagnosed in 252 (73.68%) in newly diabetic patients. **Conclusion:** Metabolic syndromes were highly associated with newly diagnosed type II diabetes patients.

Key words: DUHS, Metabolic Syndrome, NIDE, Type II Diabetic.

INTRODUCTION

MS is a collection of multiple risk factors of CVD and diabetes mellitus.[1] It includes glucose intolerance, abdominal obesity, hypertension, and dyslipidemia.[2,3] Individuals with type 2 diabetes mellitus generally faces various disproportionate stages of overweight, obesity, resistance to the insulin, excess levels of insulin circulating in the blood relative to the level of glucose, pancreatic islet β cells, and damage leading to progressively decrease of insulin secretion, impaired fasting glucose after meal and fasting blood sugar level.[4-7]

Various studies have reported higher rate of MS in patients with DM type 2.[8-10] Lee et al in 2015, conducted a prospective study in Chungju City of Korea among no-diabetic individuals.[10] In their study, Lee et al followed the patients for 8 years and status of the MS and obesity were assessed at baseline, at 4th year and at 8th year. The major objective of the study of Lee et al[10] was to investigate the impact of changes in the metabolic syndrome and obesity on diabetes. For this purpose Lee et al enrolled 2692 individuals aged 40 years and above from the community. The findings of their study revealed that changes in MS status have a significant impact on the risk of diabetes occurrence in non-obese individuals. Moreover, according to their study findings, risk of DM type 2 significantly decreases in individuals who were obese at the baseline but improve their health status and become non-obese later.[10]

Isezou SA et al[9] conducted a study on Native African. In their study, major outcome was "metabolic syndrome." In addition, they also evaluated the association of demographics and clinical parameters with metabolic syndrome. The

findings of their study reported that more than half of the population, i.e. (59%) had metabolic syndrome. Furthermore, hypertension as family history, diabetes as family history, having upper and middle socioeconomic status, residents of urban areas are the significant factors contributed in the development of MS in diabetic patients.[9]

Osuji CU et al[11] in 2012 conducted a study to determine the frequency of MS in newly diagnosed type 2 diabetes mellitus patients of Nigeria. The findings of their study have revealed that metabolic syndrome was reported in 66.7% of the Nigerian population with type 2 diabetes. Moreover, their study has reported hypertension as the most common risk factors.[11]

According to the findings of recent study from Faisalabad published in 2018, the metabolic syndrome presence was quite higher in type 2 diabetic patients. In their study, Qureshi et al[12] reported the frequency of MS in 150 type 2 diabetic patients.[12] Among these 150 type 2 diabetic patients, majority (n=117, 78%) had MS. Though, the findings of components of MS like increased adipose tissues, reduced HDL cholesterol, increased triglyceride, increased blood pressure and increased glucose level were not reported. However, the comparison of metabolic syndrome with baseline characteristics has reported a significant association of metabolic syndrome with gender of the type 2 diabetes mellitus patients.[12]

Ahmed S et al[13] conducted a similar study in Combined Military Hospital Karachi in 2010 among 155 type 2 diabetic patients. Their study findings reported MS in 67% DM type 2.[13]

Another study by Ahmed N et al from Abbottabad has revealed the similar findings. They concluded in their study that MS considerably higher, Moreover, the risk of MS was significantly higher in females type 2 diabetic patients than that of male type 2 diabetics.[14]

Various studies have reported that effective management of the MS can halt CVD and diabetes.[15-22]

This is also evident from the finding of studies on the diabetes prevention program. The finding revealed that customized, organized and rigorous physical activities are the most effective strategies to prevent type 2 diabetes mellitus in high risk populations.[23,24] In addition to this, some drug therapy which influence primary glucose metabolism like metformin and acarbose or induced weight loss like orlistat also effectively control development of DM type 2.[25-27] The objective and methods of treating abnormal blood pressure, irritation, tenderness, increased tendency of the blood to form clots quotations and dyslipidemia are same for MS patients and for general population.[28,29]

Furthermore, it is also widely reported that type 2 diabetes mellitus increases the risk of cardiovascular disease by two to four times. The high risk of cardiovascular disease in patients with MS or DM type 2, in presence of obesity, also upraises these conditions. To control this, effective strategies to prevent determinants factors in patients with metabolic syndrome or type 2 diabetes mellitus are becoming increasingly important.[30,31]

It is serious to recall that because of the gathering of several major risk factors for CVD in persons with metabolic syndrome or DM type 2, multiple preventive strategies may be required, often simultaneously. Thus, MS cases have a fivefold higher risk of diabetes mellitus, which is responsible for a significant higher rate of death.[12-14]

MATERIAL & METHODS
A total of 342 new diabetic patients were initially evaluated as part of a descriptive cross sectional study at Dow University Hospital from October 2018 to January 2019. After informed consent was obtained, the subjects were sequentially enrolled from the outpatient diabetic clinic. All subjects had diabetes according to the criteria of the World Health Organization and metabolic syndrome was defined in this study using the NCEP-ATP III criteria as mention in operational definition.

Data was computed in SPSS version 21. Mean and SD were collected for quantitative data like age, waist circumference etc. While frequency and percentages were collected for categorical data like gender, categories of different measures (BMI, WC, SBP, DBP, etc).

RESULTS

A total of 342 new diagnosed diabetic were included in this study. 189 (55.26%) were males and 153 (44.74%) were females. The mean/SD of age was 48.21±9.28 years. The mean/SD of FBS was about 192±43 mg/dl with ranges from 98 to 482 mg/dl. The mean/SD of Serum TG was about 243±152 mg/dl with ranges from 189 to 325 mg/dl. The mean/SD HDL was about 38.9±9.23 mg/dl with ranges from 12 to 102 mg/dl. The mean/SD of waist circumference was about 110.5±11.90 cm. The mean/SD systolic and diastolic blood pressure was about 150 + 8.23 & 98 + 11.28 respectively. The mean/SD of BMI was 29.23+11.23. Metabolic syndrome was diagnosed in 252 (73.68%) in newly diabetic patients.

DISCUSSION

This study was conducted among newly diagnosed DM type 2 patients attending diabetic care clinic of a tertiary care hospital of metropolitan city of Pakistan. The finding of the study reported that frequency of MS was considerably higher, i.e. 73.68%.

In majority of the patients in this study belonged to the middle and late adulthood, i.e. minimum 42 years and maximum 85 years.

In this study, the average BMI of the type 2 diabetes patients was found to be considerably higher, which was suggesting that majority of the cases were overweight and obese. Similarly, average waist circumference was also found higher. These findings are supported by various previous studies.[32-34] It is reported that obesity, particularly abdominal obesity, is the main reason of confrontation to the belongings of insulin on peripheral glucose and fatty acid utilization, frequently foremost to DM type 2.[35,36]

Increasing prevalence of cardiovascular disease and factors leading to it are the main reason of attraction towards metabolic syndrome.[3,8] Insulin resistance, the associated hyperglycemia and hyperinsulinemia, and adipocyte cytokines (adipokines) may also responsible for vascular endothelial dysfunction.[37]

Variables	Mean + SD	Minimum	Maximum
Age (Years)	48.21+9.28	42	85
BMI	29.23+11.23	25	32
Waist Circumference	110.5+11.90	90	115
FBS	192+43	98	482
Systolic BP	150+8.23	140	170
Diastolic BP	98+11.28	85	100
Triglyceride	243+152	189	325
HDL	38.9+9.23	12	102

Table-I. Characteristics of study population. Data are means + SD

Characteristics	Yes	No
Waist Circumference (Men > 102 cm, Women > 88 cm)	78	22
Blood Pressure (Systolic BP ≥ 130 mmHg or diastolic BP ≥ 85 mmHg)	65	41
Triglyceride (≥1.7 mmol/l)	71	23
HDL (< 1.03 mmol/l (male) or 1.29 mmol/l (female)	38	4

Table-II. Metabolic syndrome in newly diabetic patients.

Diabetes and Impaired Glucose tolerance are in diagnostic criteria of MS. Higher rates of MS are obvious in Diabetics. Scientific documentation, exact expected prevalence and comparison of Pakistan with region are important.[12-14]

MS in addition to a predictor of CVD is associated with type 2 diabetes mellitus. In this study the evaluated the rate of MS in cases presenting with type 2 diabetes mellitus. The results of this study revealed that majority of the patients with type 2 diabetes had MS. These statistics agree with Ahmed N[14] and colleagues who found somewhat similar number of cases with metabolic syndrome.[14] Our results are similar to other studies, where the prevalence of 70% to 80% among Caucasian type 2 diabetics and more than 75% among Chinese population having type 2 diabetes mellitus.[8,38]

We found metabolic syndrome more commonly in female subjects as compared to male participants. Like finding, Ahmed N et al[14] also revealed that the frequency of MS was higher in females. Various studies revealed quite varied results regarding gender on the occurrence of MS in various populations. In United States, MS was found generally higher in males than that of females.[39] Other studies from Korea, India, Nigeria and Oman, Kinmen and Iran have reported that female ratio is higher as compared to males.[9,40-43] However, considering results in agreement with various other studies, it may consider that DM type 2 mellitus is an indicator of MS and enable us to easily diagnose MS in type 2 diabetic patients and by controlling MS may help in controlling diabetes mellitus.

LIMITATIONS
The findings of this study could be highlighted in the light of the limitation that this was a single center study conducted on a small number of sample size due to the limitation of the duration of study.

CONCLUSION
Metabolic syndromes were highly associated with newly diagnosed type II diabetic patients.
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