OriginalArticle

Metabolic syndrome in type-2 diabetics: an update on the silent epidemic.

Mohammad Tariq, Abdul Hadi, Dr Sadeeq Ur Rahman,

Department of Medicine, Medical B ward, Khyber teaching hospital, Peshawar.

ABSTRACT

Objective

To determine frequency of metabolic syndrome in patients with type-2 diabetes.

Methods

This was a cross sectional study was conducted in Khyber Teaching Hospital, Peshawar and during an eight months period, 200 adult type-2 diabetics were evaluated for the presence of metabolic syndrome. ATP-III criteria was used for its frequency.

Result

Of 200 patients, 154 (77%) had metabolic syndrome. Out of these154 patients, 92 (59.7) were female and 62 (40.2%) were male. Ninety seven (62.98%) patients were between the age group 41 to 60 years. In 68 (44.15%) patients, all the five risk factors for the metabolic syndrome were present. However, in 57 (37.01%) patients only 3 risk factors were present. Abdominal obesity was present in 80 (51.94%) female and in 43 (27.92%) male patients. However, 68 (44.15%) female and 49 (31.81%) males had low HDL levels. Fifty six (36.36%) females and 41 (26.62%) males had elevated levels of triglycerides. Hypertension was present in 82 (53.24%) females and 48 (31.16%) males.

Conclusion

This study showed a very high prevalence of the metabolic syndrome in type 2 diabetic population. Females were more affected than males in all respects. (Rawal Med J 2010;35:).

Key Words

Metabolic syndrome, Type-2 diabetes, obesity, hyperlipidemia.

INTRODUCTION

The association between diabetes, obesity, and hyperlipidaemia is long known and has been termed “insulin resistance syndrome”, “syndrome X”, and “Metabolic syndrome”.[1] The syndrome is recognized as constellation of metabolic risk factors for the development of type-2 diabetes mellitus (DM) and atherosclerotic cardiovascular disease.[2] In the third report of the National Cholesterol Education Programme expert panel (NCEP) on detection, evaluation and treatment of high blood cholesterol in adult (ATP-III), a working definition of this syndrome was given for the first time. It was defined as presence of central obesity among men with waist circumference >102 cm (40 inches) and among women with waist circumference >88 cm (34 inches), blood pressure $\geq$130/85 mmHg, triglcerides >150 mg/dl, high density lipoprotein (HDL) in men <40mg/dl and women <50mg/dl and fasting blood sugar (FBS) >110mg/dl. The diagnosis is made when three or more of these risk factors are present.[3]

The prevalence of metabolic syndrome within individual cohorts varies with the definition used.[4] Using NCEP 2001 and 2004 (revised) criteria, the prevalence of metabolic syndrome in the Diabetes Epidemiology Collaborative Analysis of Diagnostic Criteria in Europe (DECODE) was 25.9% and 32.2% for men, and 23.4%

and 28.5% for women, respectively.[5] The prevalence in adult type-2 diabetics was 85.8%, of those 95% were female in a national survey, using ATP-III criteria.[6] Prevalence of diabetes in Pakistan is high and studies suggest that more than 12% of Pakistani adults above 25 years of age have DM.[7] Presence of metabolic syndrome increases the risk of coronary artery disease (CAD) by 7.3 times in male and 10.2 times in female patients.[8] The exact prevalence of metabolic syndrome in Pakistan is not known.[9] The aim of this study was to determine the frequency of metabolic syndrome among type-2 diabetics.

PATIENTS AND METHODS

This cross sectional study was conducted at Khyber Teaching hospital, Peshawar for an eight months period from July 2008 to February 2009. We enrolled a total of 200 adult type-2 diabetics above 30 years of age who were admitted to the medical ward for glycaemic control. All type-1 diabetics as well as young type-2 diabetics age <30 years, patients with nephrotic syndrome, renal failure, Cushing syndrome or with ascites due to any reason, patients with secondary hypertension, hepato-biliary disease and hypothyroidism and patients taking lipid-altering drugs were excluded from the study. Informed consent was taken from all participants.

Demographic and clinical data, including ischemic heart disease (history of angina pain, myocardial infarction or coronary artery surgery); family history of DM, and hypertension were recorded. Diagnosis of DM was confirmed by FBS >110mg/dl on two occasions. Sitting blood pressure was measured with mercury sphygmomanometer, using the patient's right arm and two readings were taken and the mean was calculated. Waist circumference was measured at the level of the navel with the person lightly clothed. Diagnosis of metabolic syndrome was made when three or more of these risk

factors are present. All the data were entered and analyzed by using SPSS version 14 software.

RESULTS

Out of 200 cases of type-2 DM, 117 (58.5%) were female and 83 (41.5%) were male. Of these, 154 (77%) were diagnosed to have metabolic syndrome. Out of 154 patients, female comprised 92 (59.7%), whereas 62 (40.2%) were male. The mean age was 45.3 years. Ninty seven (62.98%) patients were between the age group 41 to 60 years (Table 1).

Table 1. Metabolic syndrome in different age groups.

Age in years	No of patients	Percentage of patients
31-40	14	09.09%
41-50	36	23.37%
51-60	61	39.61%
61-70	24	15.58%
>71	19	12.33%

The mean duration of diagnosis of DM was 4.5 years. Majority of patients (85.06%) were currently on oral hypoglycemic agents. In 68 (44.15%) patients, all the five risk factors for the metabolic syndrome were present and in 57 (37.01%), only 3 risk factors were present (Table 2).

Table 2. Risk factors for metabolic syndrome among study participants.

Factors	Female	Male
3	34 (22.07%)	23 (14.93%)
4	18 (11.68%)	11 (07.14%)
5	40 (25.97%)	28 (18.18%)

The various risk factors for patients with metabolic syndrome showed that abdominal obesity was present in 80 (51.94%) female and in 43 (27.92%) male patients. However, 68 (44.15%) female and 49 (31.81%) males had low HDL levels. Fifty six (36.36%)

females and 41(26.62%) males had elevated levels of triglycerides. Hypertension was present in 82 (53.24%) and 48 (31.16%) females and males respectively.

DISCUSSION

The diagnosis of metabolic syndrome in patients might hold promise for enhanced prevention of diabetes and cardiovascular disease. Our study showed a high prevalence of 77%. An earlier national survey estimated a prevalence of 85.5%.[6] Studies from 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 DM.[11] Different studies report quite varied effects of gender on the metabolic syndrome in different populations. We observed that metabolic syndrome was more common in females with type-2 DM. The higher percentage was also reported in Nigerian women with type-2 DM.[12] The reason may be a relatively sedentary lifestyle of women, in this part of the world, due to religious and social barriers.

Prevalence of the metabolic syndrome tends to increase with age.[13] Our study also showed its increase with increasing age. Hypertension was the most frequent risk factor while abdominal obesity was the second most prevalent factor, as has been reported.[14] Hypertriglyceridemia was the least frequent. The combination of abdominal obesity and low HDL level was also reported as the most common combination among Chinese type 2 diabetics with metabolic syndrome.[15] In Greece also the most prevalent risk factor was abdominal obesity.[16] In our study, 79.86% participants were obese. High incidence of obesity contributes to a very high frequency of metabolic syndrome in our patients, especially women. In the FINRISK cohort, the metabolic syndrome was present in 75% of the subjects with impaired glucose tolerance,[17] but this cohort showed much greater frequency in men. Physical inactivity and excess weight have

been shown to be the main underlying contributors to the development of metabolic syndrome.[18]

The goal of identifying metabolic risk factors is to prevent morbidity and mortality due to type 2 DM and cardiovascular disease. Most of the risk factors are preventable and, identifying these at early stage at screening clinics might be of significant help.[19] There is worldwide epidemic of Type-2 diabetes, obesity and physical inactivity, clearly pointing to prevention of obesity as the most direct route for prevention.[20] Hypertension, diabetes, obesity and ischemic heart disease have become a problem of public health magnitude with substantial economic burden not only in developed but also in the developing countries.[21]

CONCLUSION

` Frequency of metabolic syndrome was significantly high in this study. It was more common in females with type-2 DM. Majority of patients had hypertension and obesity, which needs to be addressed more aggressively among females. Individual risk factors need to be corrected; however, prevention of these factors in the community requires more awareness. Preventive measures require substantial political will and financial investment.

Correspondence: Dr. Mohammad Tariq,
Medical "B" Unit, Khyber Teaching Hospital Peshawar, Pakistan.
Mob: 0334-9171135. Email: drtariqkhattak@yahoo.com
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