METABOLIC SYNDROME AMONG ADULTS POPULATION SINGLE CENTER EXPERANCE IN BASRAH

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ABSTRACT

Metabolic syndrome increases the risk for coronary heart disease and stroke by three folds with marked increase in cardiovascular mortality. The aim of this work is to study metabolic syndrome in adult's persons in Basrah in single center. A cross sectional hospital based study of adults persons including persons seen in the in-patient and out-patient clinic of the Al-Faiha General hospital over a period from January to August 2004, who agree to participate. The presence of 3 metabolic abnormalities is enough to establish the diagnosis of metabolic syndrome. The metabolic abnormalities were abdominal obesity, high serum triglycerides, low high-density lipoprotein cholesterol, hypertension, and high fasting plasma glucose. Total number of persons was 500, of them 152 women and 348 men. Age range 20-88 year, with mean age of 49.9± 11.3 year. Metabolic syndrome was seen in 332 persons (66.4%), 214 of males (61.4%), and 118 females (77.6%). There was a clear increase in the prevalence of the metabolic syndrome with increasing age up to the age of 79 year. In conclusion: This study reported high figure of metabolic syndrome. Adoption of Westeraern life in our society with overweight, physical inactivity, sedentary behavior, and unhealthy dietary habits may be the cause.

INTRODUCTION

According to the third report of the national cholesterol education program (NCEP) expert panel on detection, evaluation, and treatment of high blood cholesterol in adults in USA-adult treatment panel III (ATP III),[1] metabolic syndrome is considered when three or more of the following abnormalities are present, which are: abdominal obesity with waist circumference for men >102 cm and women >88 cm, serum triglycerides ≥150 mg/dl (≥ 1.7 mmol/l), low high density lipoprotein cholesterol for men <40 mg/dl (<0.9 mmol/l), and for women <50 mg/dl (<1.0 mmol/l), blood pressure≥130/85 mmHg, and fasting plasma glucose >/=110 mg/dL (6.1 mmol/l). The WHO definition of metabolic syndrome[2] is different from that of American heart association and NCEP where the WHO in 1998 defined the metabolic syndrome as presence of at least two of the following 1) hypertension, defined as antihypertensive treatment and/or elevated blood pressure (>160 mmHg systolic or >90 mmHg diastolic); 2) dyslipidemia, defined as elevated plasma triglyceride (>/= 1.7 mmol/l) and/or low high density lipoprotein cholesterol (< 0.9 mmol/l in men, < 1.0 mmol/l in women) concentrations; 3) obesity, defined as a high body mass index (BMI) (>/= 30 kg/m)[2] and/or a high waist to hip (WHR) ratio (>0.90 in men, >0.85 in women); and 4) microalbuminuria (urinary albumin excretion >/= 20 µ m g/min),[2] but some questioned the significance of microalbuminuria because of its rarity and lack of association with insulin resistance in some studies.[3,4] The NCEP definition less consistently predicted cardiovascular and all-cause mortality than WHO definition.[5,6] Metabolic syndrome increase the risk for coronary heart disease and stroke by three folds with marked increase in cardiovascular mortality.[7] The metabolic syndrome is well established entity has now been given international classification of disease (ICD-9) code 277.7.[8] Fifty percent of the population over age 60 year shows evidence of the metabolic syndrome.[4]

The aim of this work is to study metabolic syndrome in adult's persons in Basrah in single center according to the definition of the NCEP (ATP III report).

METHODS

This was a cross sectional hospital based study of adult's persons. It included persons seen in the in-patient and out-patient clinic of the Al-Faiha General Hospital over a period from January to Augest 2004, who agree to participate. Patient who were currently on drug treatment for diabetes and hypertension were considered hypertensive and diabetic respectively. For blood pressure the average of second and third blood pressure measurements in the office were considered. Two blood

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pressure recordings were obtained from the right arm of patients in a sitting position after 30 minutes of rest at 5-minutes intervals, and their mean value was calculated. The women were none pregnant, and the blood estimation of lipoprotein were taken after at least 8 hr fast with enzymatic method. A nurse measured the waist circumference with a soft tape on standing subjects midway between the lowest rib and the iliac crest. The presence of 3 metabolic abnormalities is enough to establish the diagnosis of metabolic syndrome. Chi–square test used as appropriate. Level of significance was set to be <0.05 through out analysis.

RESULTS

Total number of persons studied was 500, of them 152 were women and were 348 men. Age range 20-88 year, with mean age of 49.9±11.3 year. Metabolic syndrome was seen in 332 person (66.4%), 214 of males (61.4%), and 118 females (77.6%) (Table-1).

Table 1. ***Prevalence of metabolic syndrome according to sex.***

Sex	No.	Prevalence rate (%)
Males	214	61.4
Females	118	77.6
Total	332	66.4

All 5 metabolic abnormalities were seen in 11.6%, 4 metabolic abnormalities seen in 20.8% and 3 metabolic abnormalities seen in 34%. Only 2.2% of persons have no metabolic abnormalities what so ever (Table-2).

Table 2. ***Prevalence one or more abnormalities of metabolic syndrome among study group.***

Number of metabolic abnormalities	Men *No*. (%)	Women *No*. (%)	Total *No*. (%)
0	10(2.8)	1 (0.6)	11(2.2%)
1	48(13.7)	9(5.9)	57(11.4%)
2	76(21.8)	24(15.7)	100(20%)
3	124(35.6)	46(30.2)	170(34%)
4	57(16.3)	47(30.9)	104(20.8%)
5	33(9.4)	25(16.4)	58(11.6%)
Total	348(100)	152(100)	500(100%)

There was a clear increase in the prevalence of the metabolic syndrome with increasing age up to the age of 79 year (Table-3).

Table 3. ***Metabolic abnormalities and syndrome distribution according to age.***

Age range Year	Number of metabolic abnormalities						Metabolic syndrome *No* (%)
	5	4	3	2	1	0	
20-39	5	10	31	23	13	6	46(9.2)
40-59	41	70	106	55	35	5	217(43.4)
60-79	12	24	39	21	8	0	75(15)
≥80	0	0	3	1	1	0	3(0.6)
Total 20-88	58	104	170	100	57	11	332(66.4%)

Hypertension was the commenst metabolic abnormality (Table-4), followed by abdominal obesity, high triglycerides, high fasting glucose or diabetes mellitus (DM) and low high density lipoprotein cholesterol consequently. For age group 40-59, only abdominal obesity and high triglycerides were more common in males then females.

Table 4. ***The prevalence of metabolic syndrome and the different components of metabolic syndrome among patients according to age and sex.***

Component of metabolic syndrome and age range in years	Men	Women	Total *No*. (%)
Hypertension			
20-88	282	135	417(83.4)
20-39	53	12	65
40-59	184	73	257
60-79	41	49	90
≥80	4	1	5
Abdominal obesity			
20-88	172	133	305(61%)
20-39	35	15	50
40-59	119*	75	194
60-79	18	42	60
≥80	0	1	1
High triglycerides			
20-88	218	85	303(60.6%)
20-39	43	9	52
40-59	152*	50	202
60-79	21	25	46
≥80	2	1	3
High fasting glucose or DM			
20-88	173	74	247(49.4%)
20-39	23	5	28
40-59	123	40	163
60-79	25	29	54
≥80	2	0	2
Low high density lipoprotein			
20-88	110	72	183(36.6%)
20-39	16	5	21
40-59	79	41	120
60-79	14	26	40
≥80	1	0	1

***P value <0.05 comparison between men and women**

DISCUSSION

Array of metabolic, hemodynamic, and renal abnormalities constitutes the cardiometabolic syndrome.[9-13] A hallmark of this syndrome is visceral obesity and associated insulin resistance/ hyperinsulinemia. The syndrome is also associated with essential hyertension, abnormalities in the circadian rhythm of blood pressure and heart rate, the diabetic dyslipidemic syndrome, hypercoagulability, hyperuricemia, increased cardiovascular inflammation, and microalbuminuria, polycystic ovary syndrome, acanthosis nigricans and non-alcoholic fatty liver disease, all of which contribute to an increased risk of cardiovascular disease morbidity and mortality. Metabolic syndrome was not studded in our area before. By this study we try to shed some light on this problem in this developing society with astonishing results. The prevalence of the metabolic syndrome and its components is strongly dependent on the definition of the different components of the syndrome, which is still not accepted for all globally.[3,7,12,14] According to WHO definition of metabolic syndrome, in Palestinian, the age-adjusted prevalence of the metabolic syndrome was 17%.[15], and 14.2% of men and 16.0% of women in Mexico City diabetes study.[16] The prevalence of the metabolic syndrome ranged from 8.8% to 14.3%, depending on the definition among 1209 Finnish men.[5] For patients with type 2 DM, the story is different, and the prevalence of metabolic syndrome is much higher due to the diabetes pathogenesis it self. In Saudi patients metabolic syndrome seen in 56% of patients with Type 2 DM,[17] while in Botnia study (Finland and Sweden) the prevalence of metabolic syndrome among patients with type 2 DM according to WHO definition for women and men respectively was 84 % and 78%, (~ 80% for both sexes).[7] In Iraqi diabetics its seen in 86% (82.7% of males and 94.5% of females) (personal experience). The first large study use the NCEP definition was in USA, were metabolic syndrome among adults seen in 6.7% to 42% according to age (increase with age), with age adjusted rate of 23.7%.[12] In this study females were more commenly than men to have metabloic syndrome. For most studies females were more common than males to have metabolic syndrome.[12,16,17] Hypertension was the commenst metabolic abnormality in this study followed by abdominal, high triglycerides, high fasting glucose or diabetes and low high density lipoprotein consequently, while in USA similar study, abdominal obesity was commenst followed by low high density lipoprotein, hypertension, high triglycerides and high fasting glucose or diabetics consequently.[12] In Saudi diabetics, the commonest component of the syndrome was the hypertension.[17]

Figure 1, show comparison between our study and USA study.[12]There were high percent of high fasting glucose, which may be explained because our study was hospital based. However, for all metabolic abnormalities our population in the sudy showed higher Figures.

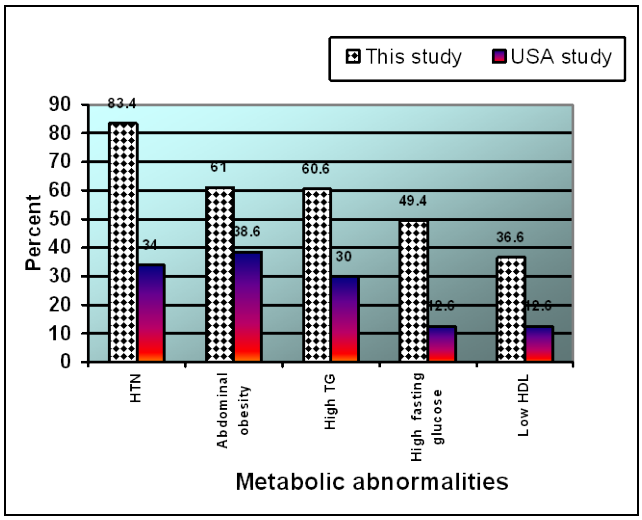

Fig 1. *Comparison between this study and USA study.*

Conclusion: we reported high figure of metabolic syndrome. One explanation of this high rate of metabolic syndrome in this study is adoption of Westeraern life in our sociaty with overweight, physical inactivity, sedentary behaviour, and unhealthy dietary habits *(non healthier lifestyle)*. The picture seen in this study consolidating the importance of conducting larger community based study to confirm the epidemic of this syndrome with high cardiovasculer morbidty and mortality. Lifestyle change is important in both treatment and prevention of the metabolic syndrome. The benefit of modest degrees of weight loss may reflect a much greater relative decrease in

visceral fat, which is considered as the key element of this syndrome.[8] Early identification, treatment, and prevention of the metabolic syndrome, though is difficult, but it may prevents greatly the cardiovascular morbidity and mortality associated with it.

Study limitations: this was a hospital-based study, so there may be a selection biased, which could explain the high figure. For that reason, we call for a larger study, community based, to give clearer picture about this syndrome in Basrah.

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