July 1999

Syndrome X and family practitioners

S Dodani
Aga Khan University

R Qureshi
Aga Khan University, riaz.qureshi@aku.edu

B S. Ali
Aga Khan University

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Pages with reference to book, From 177 To 180

Sunita Dodani,Riaz Qureshi,Badar Sabir Ali (Division of Family Medicine, Department of Community Health Sciences, The Aga Khan University, Karachi.)

Abstract

Background: Increased incidence of hypertension, non-insulin dependent diabetes (NIDDM) and coronary heart disease often cluster in the same individuals and there have been speculations that a common mechanism may be responsible for all of these pathological conditions. This risk factor constellation, which is associated with an enhanced risk for cardiovascular disease, is sometimes referred to as the 'Insulin Resistance Syndrome", 'Syndrome X", or the "Metabolic Syndrome".
Aim: To find out the prevalence of Syndrome X in the population of patients coming to a preventive health check clinic at a tertiary care teaching hospital in a megacity of the developing world.
Methods: A total of 270 patients, above the age of 40 years, who attended preventive health check clinics of 2 Family Physicians at the Aga Khan University from January 1996 to July 1997 were selected. Patients below 40 years were excluded from the study.
Results: The prevalence of Syndrome X, defined as association of obesity, NIDDM, hypertension, raised LDL and raised triglycerides is 2.6% in patients above 40 years, who were screened in this study.
Conclusion: The significant prevalence of Syndrome X is alarming and we need to strengthen our existing educational programs for prevention of obesity, increased physical activity and better control of hypertension. When drugs are selected for pharmacological treatment, priority should be given to those, which improve the insulin sensitivity index or are at least neutral in this respect (JPMA 49: 177, 1999).

Introduction

all of these pathological conditions. Obesity is one
Ageing is associated with increased incidence of component of a risk factor constellation that consists of hypertension, non-insulin dependent diabetes (NIDDM) insulin resistance and / or hyper-insulinaemia, and coronary heart disease[1]. As these conditions often hypertension, dyslipidaemia characterized by a low HDL cluster in the same individual, there have been cholesterol or raised LDL-cholesterol levels and high speculations that a common mechanism is responsible for triglycerides levels[2].
This risk factor constellation, is associated with an enhanced risk for cardiovascular disease and is sometimes referred to as the "Insulin Resistance Syndrome", "Syndrome X", or the "Metabolic Syndrome". Although the hyperinsulinaemia and insulin resistance associated with the syndrome X appears to play a central role, the relationship between insulin and the other manifestations of the syndrome have remained obscure[3].
It is hyper-insulinaemia, with its complex array of adverse metabolic effects that has recently worried physicians. Acceleration of atherosclerosis,, hypertension and worsening of the lipoprotein profile have been cited as possible adverse effects of hyperinsulinaernia[4]. Currently available data and clinical observations suggest that there is a pathogenetic relationship between hypertension, diabetes mellitus and atherosclerosis, which together are components of Syndrome X, found predominantly in males[5].
The hypothesis of insulin resistance leading to arterial hypertension is based on increased sympathomimetic activity, sodium retention and trophic effects of insulin[6].
Reduced vascularization of the skeletal muscles associated with insulin resistance leads to enhanced

development of hypertension with subsequent hypertrophy of the vascular wall and left ventricle leading to the development of arteriosclerosis[7].

Syndrome X has been defined in different ways. It was first described by Reaven as Reaven's Syndrome[8], which included hyper-insulinaemia, glucose intolerance, hyperlipidaem ia, hypertension and fibrinolytic impairment. Another name used is 5H Syndrome i.e., association of hyper- insulinism, hyperglycemia (NIDDM), hyperlipoproteinaemia, hypertension, hirsutism and the polycystic ovary syndrome[9].

Syndrome X-plus is a newly suggested condition, which includes hyperuricemia as an additional feature to Reavens components but does not include fibrinolytic impairment. For the purpose of this study, Syndrome X has been defined as an association of hypertension, hyperglycemia (NIDDM), obesity, low HDL and raised LDL[4-6].

The hormonal and metabolic features of syndrome X suggest that Family Practitioners have an important role to play in the preventive and curative aspects of hypertension and other associated conditions which enhance the risk of cardio-vascular morbidity and mortality in the population. According to a study covering 10.9% of the total population aged above 40 years, the prevalence of Syndrome X characterized by presence of glucose intolerance, hypertension and hypertriglyceridemia was
1 .6%[10].

The objecives of this study were to find the prevalence of Syndrome X and look into factors associated with it in patients presenting to a Screening Family Medicine Clinic.

Methodology

It was a retrospective cross-sectional study, including all patients above the age of 40 years attending the Screening Family Medicine Clinics of two family physicians, at the Aga Khan University Hospital Karachi. The data was gathered through the confidential records of patients coming to the clinic between January 1996 and July 1997 (i.e., 18 months). For the purpose of this study, certain standard values were used (Table 1).

Table 1. Operational Definitions

Diabetes	FBS >140 mg/dl RBS >200 mg/dl
Obesity	Body mass index (BMI) >25
Cholesterol	>200 mg/dl (Abnormal)
Triglycerides	>240 mg/dl (Abnormal)
LDL	>150 mg/dl (Abnormal)
HDL	<30 mg/dl (Abnormal)
Hypertension	≥140/90

Analysis

Data was entered and analyzed in the EPI-Info
program at the Family Medicine Division, Department of Community Health Sciences at the Aga Khan University Hospital. Correlation of associated factors and other variables were analyzed with the help of level of significance (pvalue).

Results

A total of 401 patients were seen from January 1996 till July 1997 at the Family Medicine Screening clinics of 2 family practitioners at the Aga Khan University Hospital, out of which the data on 270 patients who were above the age of 40 years was collected and analyzed, as Syndrome X is seen in ageing patients.

Table 2. Characteristics of the Study Population

Variable		No.	Percent
Sex:			
	Male	151	55.9
	Female	119	44.1
BMI:			
	Normal	83	3.6
	Abnormal	164	66.4
Smoking:			
	Smoker	50	18.6
	Ex-Smoker	20	7.4
Hypertension		104	
Hyperglycemia		99	24.68
IGT (Impaired glucose tolerance)		27	10.0
	NIDDM	69	95.8
	IDDM	3	4.2
IHD	84	31.2	
	MI	17	20
	Angina	68	80.0
Hyperlipidaemia		151	56.1
	Cholesterol >200	135	89.4
	↑ TGs (Triglycerides)	51	33.3
	↓ HDL	5	3.3
	LDL > 150	88	57.0
CVA	5	1.9	
Raised uric acid		25	9.3

Table 2 shows few of the characteristics of the study patients. Raised BMI and dyslipidaemia were present in more then the majority of patients, whereas presence of hypertension and hyperglycemia was significant (Figure 1).

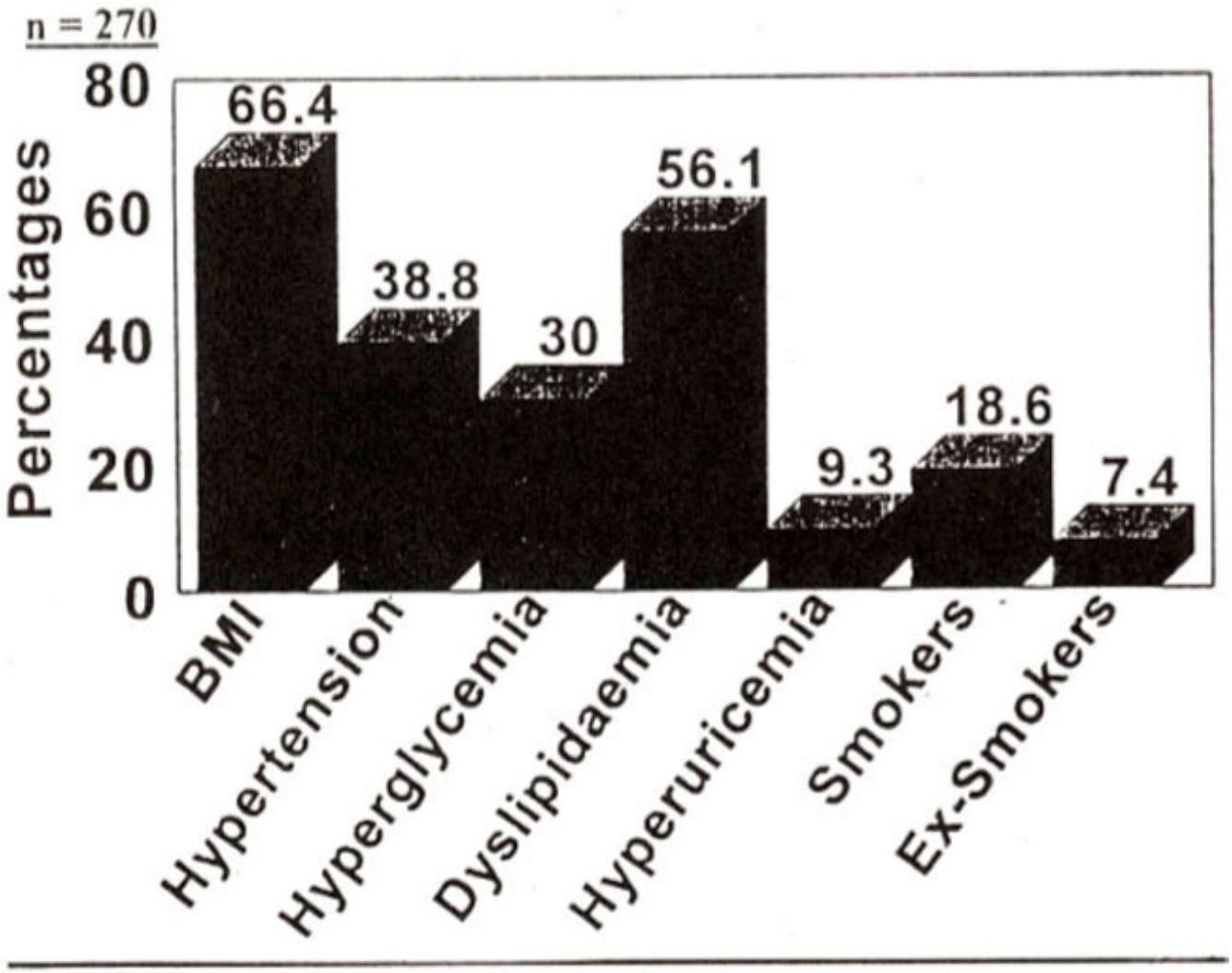

Figure 1. Characteristics of Study Population.

We correlated the relationship of CVA and IHD with respect to hypertension and found unexpectedly that CVA was seen more in our non-hypertensive group (Table 3);

Table 3. Prevalence of Syndrome X: In a Screening Clinic.

Correlation of Hypertensive Patients with IHD and CVA.

Hypertension	Yes	No
CVA	1	4
IHD	44	39
CVA + IHD	-	1
Total	45	44

this could possibly be due to small sample size.

The prevalence of Syndrome X, defined as an association of obesity, NIDDM, hypertension, raised

LDL and raised triglycerides was found to be 2.6% in patients above the age of 40 (Figure 2).

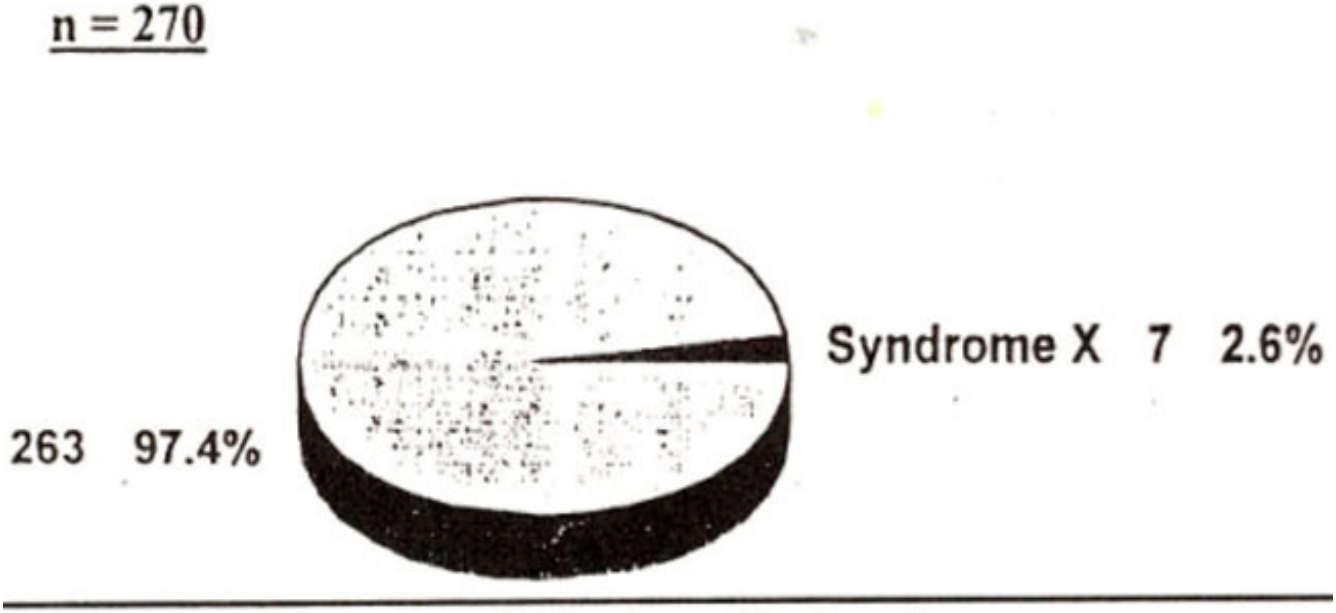

Figure 2. Prevalence of Syndrome X.

Discussion

The relationship betwen obesity and cardiovascular disease is a matter of debate for many years. Recent studies have demonstrated that obesity defined as body mass index of 25 kg/m^2 or higher is associated with an exponential increase of cardiovascular complications[10]. The effect is largely mediated by the induction of established risk factors such as dyslipidaemia. hypertension and type 2 diabetes mellitus. Recently, there is a growing evidence that the occurrence of most complications of obesity depends not only on the degree of overweight but also on the pattern of body fat distribution[10]. Many data suggest that the anatomical localization of body fat is more important for the risk of developing complications than the adipose tissue mass perse".

The components of the metabolic Syndrome X are characterized by varying forms and degrees of insulin resistance. It is assumed that insulin resistance, defined as diminished biological response to the action of insulin, represents the primary defect or at least the common pathogenetic link between these disturbances.

It is hyperinsulinaemia, with its complex array of adverse metabolic effects that has recently concerned physicians. Acceleration of autheroscelerosis, hypertension and worsening of the lipoprotein profile have been cited as possible adverse effects[11]. In this study, obesity and hyperlipidaemia was seen in significant number of patients attending screening clinics (Figure 1). The hypotheses of insulin resistance in the pathogenesis of arterial hypertension as part of the Syndrome X is based on sympathomimetic, sodium retention and trophic effects of insulin[8-10].

From the clinical aspects, this stimulating pathogenetic concepts within the framework of Syndrome X makes it possible to use a more adequate approach to prevention and treatment not only of arterial hypertension but also of associated phenomena which enhance the risk of cardiovascular morbidity and mortality in the population. This shows the impact of dyslipidaemias and diabetes in making the outcome worse.

Conclusion

This study has highlighted the prevalence of Syndrome X which is described as the constellation of obesity, NIDDM, hypertension, raised LDL and raised triglycerides in a population of patients presenting to a screening family medicine clinics at a city university hospital. The significant prevalence of Syndrome X is alarming and we need to strengthen our existing health education programs for prevention of obesity, increased activity, better control of hypertension and raised lipids. When drugs are selected for pharmacological treatment in such cases, priority should be given to those which improve the insulin sensitivity index (ACE-inhibitors, alpha blockers) or are at least neutral in this respect (Ca antagonists, beta blockers with ISA). Drugs must not enhance associated hyperlipoproteinaemia. A further study is planned for estimating the fasting levels of insulin on the cases identified in the study.

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