An evaluation of lipid profile in patients with metabolic syndrome at a tertiary care teaching hospital based in Tamilnadu

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Abstract---Background: Metabolic risk factors contributing are abdominal obesity, dyslipidemia, hypertension, elevated plasma glucose, pro-thrombotic state and proinflammatory state. Diabetes mellitus (DM), a metabolic disorder caused by impaired insulin secretion, peripheral insulin resistance or both, has become a major public health problem in India. Aims and Objectives: To evaluate the lipid profile in patients with Metabolic Syndrome at a tertiary health care centre Tamilnadu. Materials and methods: This is a cross-sectional study carried out in the Department of Medicine, Shri Sathya Sai Medical College and Research Institute in Patients diagnosed with Metabolic syndrome were identified and randomly selected in all age groups. 50 metabolic syndrome patients (Cases) and age matched 50 normal patients (Controls) were enrolled into the study with written explained consent. All patients underwent lipid profile testing and fasting and post -prandial sugar level as per standard protocol. Statistical analysis was done with unpaired t-test and chi-square test using SPSS version 19 software. Results and Observations: our study contains that the majority of the patients were in the age group 61-70y – 42%, 50-60y.29%, >70y 13% similarly controls were also 60-70y- 38%, 50-60y -29%, >70y were 8% and hence both the cases and controls were comparable with age (p>0.05). The majority of the patients were male in both groups and male/ female ratios in the both cases and controls were comparable with each other (p>0.05). The mean FBS was significantly higher in cases than control i.e. 168.52±32.23 and 87.65±11.89 (<0.001**) The PPBS mg/dl was 290.23±41.24, 129.62±15.82 (<0.001**).The Total cholesterol mg/dl i.e.210.13±21.78, 192.54±16.94 (<0.001**). LDL mg/dl 129.43±12.43, 101.45±12.87) (p<0.01**) ; Triglyceride mg/dl-

230.42±38.82,142.17±34.52(<0.01**)   VLDLmg/dl51.   24±6.72, 33.23±3.59 (p<0.001**); was significantly higher in cases as compared to controls and HDL mg/dl was 33.17±7.23, 45.62±4.52 (p<0.01**) was significantly lesser than controls. Conclusion: our study concludes that the all patients with metabolic syndrome were having the deranged lipid profile level and that metabolic syndrome was more prevalent in the older age groups and in male patients.

Keyword---Dyslipidemia, Metabolic Syndrome, Type II diabetes, Lipid Profile, Metabolic risk factors, TGL, HDL.

Introduction

Metabolic risk factors contributing are abdominal obesity, dyslipidemia, hypertension, elevated plasma glucose, pro-thrombotic state and proinflammatory state [1-4]. Dyslipidaemia characterized by increase TGL and decrease HDL leads to cardiovascular complications. It is seen in 20-80% of NAFLD patients [5] and the leading cause of deaths. Several studies were. Diabetes mellitus (DM) has become a major public health problem in India. This is a metabolic disorder caused by impaired insulin secretion, peripheral insulin resistance or both. It is characterized by raised blood glucose with diminished uptake and metabolism of cellular glucose as well as altered lipid and protein metabolism.[6] Diabetes not only increases morbidity and mortality, but also decreases the quality of life. Also, this disease and its complications are causing a heavy economic burden for patients suffering from it.[7,8] A clustering of cardiovascular risk factors that appeared in certain patients was identified as syndrome X by Reaven in 1988. The risk factors identified by Reaven included glucose intolerance, hypertension, elevated triglyceride and low high density lipoprotein cholesterol.[9] In 1998 the WHO proposed a definition for metabolic syndrome (MS) that included the presence of hypertension, dyslipidemia, glucose intolerance and microalbuminuria.[10] The National Cholesterol Educational Program's Adult Treatment Panel III (NCEP ATP III) proposed a new definition which utilized components that were typically measured in these patients (Blood pressure, lipids and glucose) or could be easily measured in clinical practice (waist circumference).[11] There is an alarmingly high prevalence of diabetes and hypertension in the Indian population which has been attributed to metabolic syndrome. Several studies have shown a high incidence of this syndrome in Indians compared to Western population. ATP III considered the obesity epidemic is mainly responsible for the rising prevalence of metabolic syndrome. Obesity contributes to hypertension, high serum cholesterol, low HDL, and hyperglycaemia and it is otherwise associated with high cardiovascular disease risk[12,13] Women tend to have fewer cardiovascular events, the populationattributable risk for hypertension is higher for women than men due to their longer life expectancy and the rise in the incidence of hypertension with age.[14] Advancing age affects all levels of pathogenesis which likely explains why the prevalence of MS increases with age.[15]

Materials and Methods

This is a cross-sectional study carried out in the Department of Medicine, Shri Sathya Sai Medical College and Research Institute in patients with Metabolic syndrome. Metabolic syndrome has been defined as a cluster of conditions increased blood pressure, high blood sugar, excess body fat around the waist, and abnormal cholesterol or triglyceride levels that occur together. The criteria that we used, for diagnosing metabolic syndrome (three or more of the risk factors) were according to the National Cholesterol Educational Program's ATP III 5 criteria. Risk factor defining levels (1) Abdominal obesity Waist circumference Men >102 cm (40 inches) Women > 88 cm (35 inches) (2) TG ≥ 150 mg/dl (3) HDL-C Men 130/>85 mmHg (5) Fasting glucose ≥110 mg/dl. Patients of Metabolic syndrome thus identified were randomly selected in all ages to obtain 52 (Cases) and age matching 52 normal patients (Controls). These were enrolled into the study after written explained consent. All patients underwent lipid profile test and Fasting and Post -prandial Sugar level as per the standard protocols. The statistical analysis was done using unpaired t-test and chi-square test calculated by SPSS 19 version software.

Results and Observations

Table1: Age distribution

Age in years	Cases		Controls	
	No	%	No	%
20-30	3	6	5	10
40-50	5	10	8	15
50-60	15	29	15	29
60-70	22	42	20	38
>70	7	13	4	8
Total	52	100	52	100

The majority of the patients were in the age of 61-70 – 42%, followed by 50-60 i.e.29%, >70 were 13% .Similarly controls were also 60-70- 38%, 50-60 -29%, >70 were 8% and hence both the cases and controls were comparable with age (p>0.05), as in table 1 and figure 1.
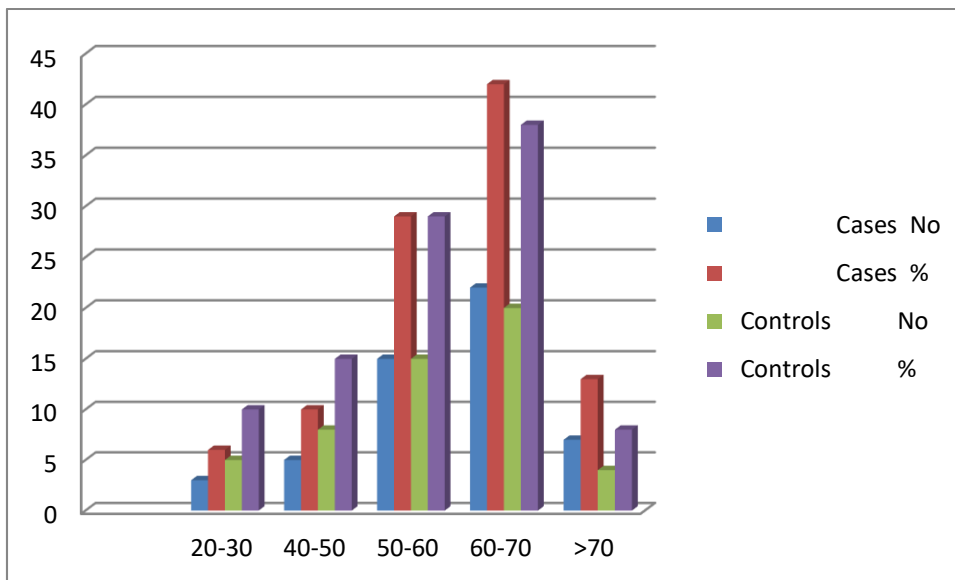
Figure 1. Age distribution in both the groups.

Table 2: Gender distribution

Sex	Cases		Controls	
	No	%	No	%
Male	31	60	33	63
Female	21	40	19	37
Total	52	100	52	100

The majority of the patients were Male in both groups and male female composition in the both cases and controls were comparable with each other (p>0.05). as in table 2 and figure 2.
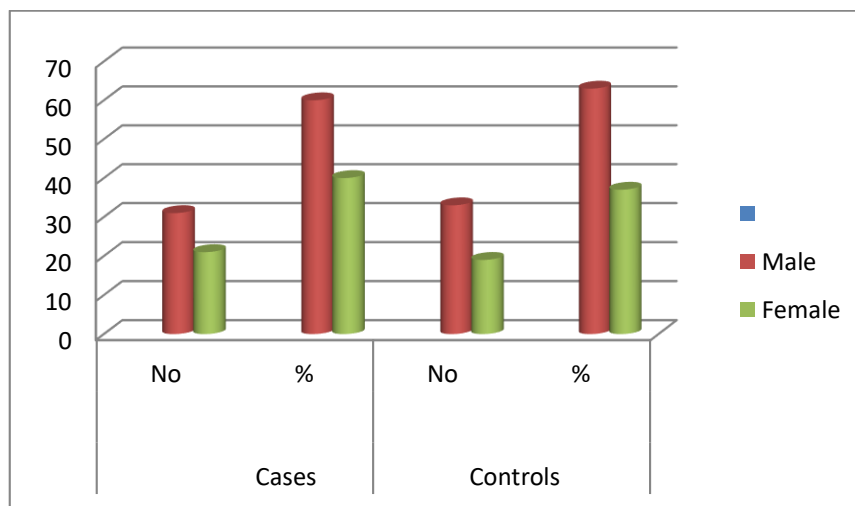

Figure 2. Sex distribution in both the groups

Table 3: Comparison of sugar parameters in both the groups

Sugar parameters	Cases	Controls	P value
FBS mg/dl	168.52±32.23	87.65±11.89	<0.001**
PPBS mg/dl	290.23±41.24	129.62±15.82	<0.001**

The mean FBS was significantly higher in cases than control i.e. 168.52±32.23 and 87.65±11.89 (<0.001**). The PPBS mg/dl was 290.23±41.24, 129.62±15.82 (<0.001**).

Table 4: Comparison of lipid parameters in the groups

Lipid parameters	Cases	Controls	P value
Total cholesterol mg/dl	210.13±21.78	192.54±16.94	<0.001**
LDL mg/dl	129.43±12.43	101.45±12.87	<0.01**
Triglyceride mg/dl	230.42±38.82	142.17±34.52	<0.01**
HDL mg/dl	33.17±7.23	45.62±4.52	<0.01**
VLDL mg/dl	51.24±6.7	33.23±3.59	<0.001**

The Total cholesterol mg/dli.e.210.13±21.78, 192.54±16.94 (<0.001**); LDL mg/dl 129.43±12.43, 101.45± 12.87) (p<0.01**) Triglyceridemg/dl 230.42±38.82, 142.17±34.52(<0.01**); VLDLmg/dl 51.24 ±6.72,33.23±3.59 (p<0.001**) was significantly higher in cases as compared to controls and HDL mg/dl was 33.17±7.23, 45.62±4.52 (p<0.01**) was significantly lesser than controls.

Discussion

The chance of developing diabetes mellitus, cardiovascular disease, non-alcoholic fatty liver disease, non-alcoholic steatohepatitis, cirrhosis, cerebrovascular disease and chronic kidney disease are high in these particular groups of people. The prevalence of metabolic syndrome is approximated as 17%-25% in general population and 59% to 61% in people with diabetes mellitus. Researchers have shown a higher incidence of the metabolic syndrome in men than in women. Type 2 diabetes mellitus accounts for more than 90% of cases of diabetes mellitus, leading to major public health burden in community. Dyslipidemia is one of the important metabolic abnormalities related with diabetes mellitus.[16] Present study was carried to assess the prevalence and pattern of dyslipidemia in type 2 diabetes mellitus patients. In the present study it was observed that type 2 diabetic patients had poor glycemic control which was reflected by higher values of fasting and postprandial blood sugar [17,]. In our study we have seen that the majority of the patients were in the age of 61-70 – 42%, followed by 50-60 i.e.28% , >70 were 10% similarly controls were also 60-70- 38%, 50-60 -26%, >70 were 8% and hence both the cases and controls were comparable with age (p>0.05) The majority of the patients were Male in both groups and male female composition in the both cases and controls were comparable with each other (p>0.05) . The mean FBS was significantly higher in cases than control i.e 168.52±32.23 and 87.65±11.89 (<0.001**). The PPBS mg/dl was 290.23±41.24, 129.62±15.82

(<0.001**). The Total cholesterol mg/dli.e.210.13±21.78, 192.54±16.94 (<0.001**); LDL mg/dl 129.43±12.43, 101.45±12.87) (p<0.01**); Triglyceride mg/dl230.42±38.82 , 142.17±34.52 (<0.001**) was significantly higher in cases as compared to controls and HDL mg/dl was 33.17±7.23, 45.62±4.52 (p<0.01**) was significantly lesser than controls. These findings are similar to Pankaj J. Akholkar et al [18] they found abnormal triglyceride level in 32% (n=69) and abnormal FBS 34% (n=65). Amongst all females 92.4% (n=98) had an abnormal HDL-C levels followed by an abnormal waist circumference in 52.38% (n=55). Incidence of abnormal FBS and TG in females were 30.5% (n=33) and 32.4% (n=35) respectively. Bashu Dev Pardhe et al. [19] shows the bidirectional and mutual linkage of high density lipoprotein when compared to controls, which was significantly less as compared to the controls. Likewise another study was carried out by Agarwal et al. and Uttareshvar et al who reported that there was an increase in TC, TGL, LDL-C, VLDL-C but decrease in HDL-C levels indicating the possible atherogenic dyslipidaemia [20,21].

Conclusion

Our study concludes that all patients with metabolic syndrome were having a significantly deranged lipid profile level and that metabolic syndrome was more prevalent in older age groups and in male patients.

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Conflict of Interest: None

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