To Compare The "Presenting Complications" of the Lean With Normal Weight / Obese Type 2 Diabetes Patients.

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ABSTRACT

Background: Type 2 diabetes mellitus is the most prevalent form of diabetes seen worldwide. Epidemiological data over the past decades have shown that the pattern and profile of type 2 diabetes mellitus are very different in India compared to the West. Aim: To study the presenting complications of lean, normal and obese type 2 diabetes mellitus. **Methods:** 100 patients Type 2 diabetes mellitus patients were divided into 3 groups. Group A includes BMI < 18.5 Kg/m2 (Lean Body Weight Type 2DM) and Group B includes BMI, between 18.5 and 24.9 Kg/m2 (Normal Weight Type 2 DM). Group C: BMI > 30Kg/m2 (Obese Type 2 DM). **Results:** Incidence of hypertension is 4.6% in lean patients as compared to 44.2% in normal and 51.2%% in obese diabetics. Like wise cardiac complications are low in lean diabetics (8.3%) as compared to 50% in normal and 41.7%in obese diabetics. Neuropathy (45.5%), Retinopathy (35.2%) are common in lean diabetics. **Conclusion:** Increased incidence of microvascular complications like neuropathy, retinopathy was observed in lean diabetics. . Incidence of IHD was low in the lean as compared to normal and Obese.

Keywords: complications, Diabetics, Body Weight.

INTRODUCTION

Diabetes Mellitus is a group of metabolic disorders characterized by a deficiency of insulin secretion and / or insulin effect, which causes hyperglycemia, disturbances of carbohydrate, fat and protein metabolism and a constellation of chronic complications. Diabetes is and will remain a threat to global health. Up to 80% of diabetes live in low and medium social economic status. The prevalence of diabetes in India in 2013 was estimated to be 65.1 million. In asia, the prevalence of diabetes is increasing rapidly and diabetes phenotype is somewhat different from that in the European countries with an onset at a lower BMI and younger age, greater visceral adiposity and reduced insulin secretory capacity. The incidence of diabetes is showing an alarming rise in developing countries, particularly in India.[1] 60-80% of the diabetics in developed countries are obese, whereas in India we find that clinical profile of diabetics is different.[2] Most of the patients attending our diabetic clinic are not obese as defined by existing parameters such as BMI. It is interesting to note that most patients fall in normal weight group and some even lean group. Obesity in type 2 diabetes is less common in Indian population compared to western population.[3,4] So, it is worth studying the clinical profile of lean type 2 diabetes, by comparing with normal and obese population with type 2 diabetes.

Aim
To study the presenting complications of lean, normal and obese type 2 diabetes mellitus.

MATERIALS AND METHODS

This prospective observational study was conducted in Department of General Medicine, Annal Gandhi Memorial Government Hospital, Trichy. 100 patients Type 2 diabetes mellitus patients were divided into 3 groups. Group A includes BMI < 18.5 Kg/m2 (Lean Body Weight Type 2DM) and Group B includes BMI, between 18.5 and 24.9 Kg/m2 (Normal Weight Type 2 DM). Group C: BMI > 30Kg/m2 (Obese Type 2 DM). A detailed history were taken from each person, i.e. Age of onset, duration, any positive family history, dietary pattern, presenting complaints – at the time of diagnosis etc. Detailed examination was done for all the hundred patients to find out various complications, if any. Exclusion Criteria: Presence of history of pulmonary

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tuberculosis. Presence of other chronic illnesses that could affect body weight like chronic liver disease and chronic kidney disease. Type 2 Diabetes patients with Age of onset less than 30 years. History wise, particularly in lean patients those who were normal or obese at the time of presentation, but lost body weight significantly after the detection of type2 Diabetes mellitus. Patients with history of Cancer /HIV. Over weight patients with BMI between 25 to 30.

RESULTS

This prospective observational study was conducted in Department of General Medicine, Annal Gandhi Memorial Government Hospital, Trichy. 100 patients Type 2 diabetes mellitus patients were divided into 3 groups. Group A includes BMI < 18.5 Kg/m2 (Lean Body Weight Type 2DM) and Group B includes BMI, between 18.5 and 24.9 Kg/m2 (Normal Weight Type 2 DM). Group C: BMI > 30Kg/m2 (Obese Type 2 DM). A detailed history were taken from each person, i.e. Age of onset, duration, any positive family history, dietary pattern, presenting complaints – at the time of diagnosis etc. Detailed examination was done for all the hundred patients to find out various complications, if any. Exclusion Criteria: Presence of history of pulmonary tuberculosis. Presence of other chronic illnesses that could affect body weight like chronic liver disease and chronic kidney disease. Type 2 Diabetes patients with Age of onset less than 30 years. History wise, particularly in lean patients those who were normal or obese at the time of presentation, but lost body weight significantly after the detection of type2 Diabetes mellitus. Patients with history of Cancer /HIV. Over weight patients with BMI between 25 to 30.

Table 1: Distribution of FBS in study groups.

FBS	Lean Group A	Normal Group B	Obese Group C	P value
Normal	4	9	11	0.243
Abnormal	15	40	21	
Total	19	49	32	

Table 2: Distribution of PPBS in study groups.

PPBS	Lean Group A	Normal Group B	Obese Group C	P value
Normal	1	6	5	0.544
Abnormal	18	43	27	
Total	19	49	32	

Table 3: Distribution of Macrovascular Complications.

Groups	Cardiac	Renal	Hypertension	P value
Lean Group A	3	6	2	0.013
Normal Group B	18	11	19	0.342
Obese Group C	15	8	22	<0.0001

Table 4: Distribution of Microvascular Complications.

Groups	Neuropathy	Retinopathy	Infections	P value
Lean Group A	10	6	9	0.010
Normal Group B	6	7	5	0.526
Obese Group C	4	4	3	<0.0001

Lean diabetics are less prone to develop macrovascular complications – like hypertension and Ischemic Heart Disease. Incidence of hypertension is 4.6% in lean patients as compared to 44.2% in normal and 51.2%% in obese diabetics. Like wise cardiac complications are low in lean diabetics (8.3%) as compared to 50% in normal and 41.7%in obese diabetics. [Table 3]

Among the microvascular complications neuropathy (45.5%), Retinopathy (35.2%) are common in lean diabetics in our study which are statistically significant. Only 24% of lean diabetics had nephropathy, which is not statistically significant. In normal weight group, incidence of neuropathy, retinopathy and nephropathy are 27.2%, 41.1% and 44% respectively. In obese patients, incidence of neuropathy, retinopathy and nephropathy are 18.1%, 23.5% and 32% respectively. In our study, 52.9% of lean patients with type 2 diabetes presented with infections as compared to 29.4% in normal and 17.6 % in obese 52 patients. Values are statistically significant- p value < 0.0001.Majority of the lean diabetics in our study group presented with infections. [Table 4]

DISCUSSION

Our study includes 100 patients with type 2 diabetes. Among them normal weight (49%), obese patients (32%) and lean type 2 diabetics (19%) were identified. In our study there is no statistically significant relationship between age and BMI observed. But study conducted by Prabhu et al,[5] mean age of onset of diabetes in lean were 60.34 + 13.5 years. In Gohel DR. et al study it was between 30-40 years.[6] In our study, lean type 2 Diabetes patients were slightly higher in female sex (21.2%) which was statistically significant. Study conducted by Prabhu M et al observed most lean type 2 DM were males (65% of total lean) type 2 DM which was statistically not significant.[5] Positive family history was present only in 9.6% of patients with lean body weight type 2 DM as compared to 35.4% in normal weight and 54.8% in obese patients with type 2 DM which were statistically significant. Study conducted by Prabhu M et al observed positive family history in 45% of lean and 62.6% in normal body weight diabetics.[6] Study conducted by Gohel DR et al observed low incidence of positive

family history (20%) in lean as compared to 40% in normal and 44% in obese patients.[6]

In our study, increased incidence of microvascular complications like neuropathy, retinopathy was observed in lean diabetics which is statistically significant. 47.3% of lean patients had neuropathy as a presenting feature as compared to 31.5% in normal and 21.1% in obese patients with a 'p' value of 0.010 (significant). Retinopathy also increased in lean type 2 Diabetics with 35.2% in lean, 41.1%in normal and 23.5% in obese patients though it is not statistically significant. Mohan et al in their study,[7] also found a higher prevalence of microvascular complications among lean type 2 diabetic patients, compared to diabetics with ideal body weight or obese diabetic patients. Mukhyaparna et al.,[8] reported 35%, 6.6% and 27% prevalence of neuropathy, nephropathy and retinopathy, respectively. Sinharoy et al.,[9] reported the prevalence of neuropathy to be 32%, nephropathy 28% and retinopathy 28%. In our study, the incidence of hypertension was 4.6% in lean as compared to 44.2% in Normal and 51.2 % in Obese. Incidence of IHD was low in the lean as compared to normal and Obese. Whereas hypertension and coronary artery disease tend to be more common in the obese group.

CONCLUSION

Lean diabetics have more severe hyperglycemia and poor metabolic control. They are more prone for infections. Increased incidence of microvascular complications like neuropathy, retinopathy was observed in lean diabetics. . Incidence of IHD was low in the lean as compared to normal and Obese.

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