Original Research

Clinico-Biochemical Profile and Treatment Response of Type 2 Diabetics Visiting Medicine OPD: An Institutional Based Study

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ABSTRACT

Background:Diabetes is a group of metabolic diseases characterized by hyperglycemia resulting from defects in insulin secretion, insulin action, or both. The chronic hyperglycemia of diabetes is associated with long-term damage, dysfunction, and failure of different organs, especially the eyes, kidneys, nerves, heart, and blood vessels.Hence; the present study was conducted for clinico-biochemical profile and treatment response of type 2 diabetics visiting medicine OPD.

Materials and Methods:90 patients diagnosed with Type 2 Diabetes (T2D) were enrolled. A significant proportion of the participants (62.2%) were administered two or three oral antidiabetic agents. Metformin emerged as the most frequently prescribed medication, utilized by over 90% of the cohort, followed by sulfonylureas, which were prescribed to 55.7% of the patients. Specifically, 91% of the lean group and 94% of both the normal-weight and overweight/obese groups received metformin. Statistical analyses were performed using the Statistical Package for Social Sciences and Microsoft Excel.

Results: In this study, there were 90 subjects of which 35 were females and 55 were males. Total cholesterol levels of lean, normal and overweight diabetic subjects were 182.1±47.6 mg/dl, 180.23±43.9 mg/dl and 181.55±36.9 mg/dl, respectively. Triglyceride levels of lean, normal and overweight diabetic subjects was 184.23±79.5 mg/dl, 178.2 ± 81.4 mg/dl and 186.1 ± 77.7 mg/dl, respectively. Hypertension was present in 15 lean subjects, 7 normal subjects and 28 obese subjects. Neuropathy was seen in 10 lean subjects, 5 normal subjects and 27 obese subjects. Hence; co-morbidities were significantly higher among obese patients.

Conclusion: Overweight and obese individuals may experience advantages in glycaemic regulation through reductions in HbA1c levels; conversely, patients of lean and normal weight often present with more pronounced and challenging hyperglycaemia that is harder to manage.

Keywords: Type 2 diabetes, Clinical profile, Biochemical profile.

INTRODUCTION

Diabetes is a group of metabolic diseases characterized by hyperglycemia resulting from defects in insulin secretion, insulin action, or both. The chronic hyperglycemia of diabetes is associated with long-term damage, dysfunction, and failure of different organs, especially the eyes, kidneys, nerves, heart, and blood vessels.[1]

Several pathogenic processes are involved in the development of diabetes. These range from autoimmune destruction of the β-cells of the pancreas with consequent insulin deficiency to abnormalities

that result in resistance to insulin action. The basis of the abnormalities in carbohydrate, fat, and protein metabolism in diabetes is deficient action of insulin on target tissues. Deficient insulin action results from inadequate insulin secretion and/or diminished tissue responses to insulin at one or more points in the complex pathways of hormone action. Impairment of insulin secretion and defects in insulin action frequently coexist in the same patient, and it is often unclear which abnormality, if either alone, is the primary cause of the hyperglycemia.[2,3]Hence; the present study was conducted for clinico-biochemical profile and treatment response of type 2 diabetics visiting medicine OPD.

MATERIALS AND METHODS

90 patients diagnosed with Type 2 Diabetes (T2D) were enrolled. The treatment regimen consisted of conventional medical therapies for T2D, which included antidiabetic medications. A significant proportion of the participants (62.2%) were administered two or three oral antidiabetic agents. Metformin emerged as the most frequently prescribed medication, utilized by over 90% of the cohort, followed by sulfonylureas, which were prescribed to 55.7% of the patients. Specifically, 91% of the lean group and 94% of both the normal-weight and overweight/obese groups received metformin. Statistical analyses were performed using the Statistical Package for Social Sciences (SPSS 21.0) and Microsoft Excel 2019. The Kolmogorov-Smirnov test was employed to assess the normality of continuous variables, with data presented as mean ± standard deviation.

RESULTS

In this study, there were 90 subjects of which 35 were females and 55 were males.The mean age of lean, normal and overweight diabetic subjects was 47.8 ± 13.1 years, 50.5 ± 12.2 years and 48.3 ± 2.4 years, respectively. The mean duration of diabetes in lean, normal and overweight subjects 2.9 ± 2.1 years, 3.1 ± 5.6 years and 5.0 ± 6.3 years, respectively. The mean BMI of lean, normal and overweight diabetic subjects was 18.3 ± 3.4 Kg/m^2 , 20.3 ± 6.7 Kg/m^2 and 27.5 ± 8.4 Kg/m^2, respectively. Total cholesterol levels of lean, normal and overweight diabetic subjects was 182.1±47.6 mg/dl, 180.23±43.9 mg/dl and 181.55±36.9 mg/dl, respectively. Triglyceride levels of lean, normal and overweight diabetic subjects was 184.23±79.5 mg/dl, 178.2 ± 81.4 mg/dl and 186.1 ± 77.7 mg/dl, respectively. Hypertension was present in 15 lean subjects, 7 normal subjects and 28 obese subjects. Neuropathy was seen in 10 lean subjects, 5 normal subjects and 27 obese subjects. Hence; co-morbidities were significantly higher among obese patients.

Table 1: Gender-wise distribution of subjects

Gender	Number of subjects	Percentage
Males	55	55
Females	35	35
Total	90	90

Table 2: Characteristics of lean, normal weight and overweight/obese patients with type 2 diabetes mellitus

Parameters	Lean	Normal	Overweight
Age (Years)	47.8 ± 13.1	50.5 ± 12.2	48.3 ± 2.4
Duration (Years)	2.9 ± 2.1	3.1 ± 5.6	5.0 ± 6.3
BMI (Kg/m^2)	18.3 ± 3.4	20.3 ± 6.7	27.5 ± 8.4
HbA1c	9.3 ± 1.7	8.7±2.9	7.6 ± 2.2
Total cholesterol	182.1±47.6	180.23±43.9	181.55±36.9
Triglycerides	184.23±79.5	178.2 ± 81.4	186.1 ± 77.7
High density lipoproteins	46.3 ± 11.3	42.8 ± 10.3	42.9 ± 16.3
Low density lipoproteins	98.50± 42.9	96.6 ± 38.9	94.5 ± 38.9
Nephropathy	10	5	27
Hypertension	15	7	28
Retinopathy	8	5	22
Neuropathy	9	6	23
Metformin	12	3	20
Sulphonylureas	10	2	22
Insulin	9	8	24

DISCUSSION

Epidemiological data over the past decades have shown that the clinical pattern and phenotype profile of patients with Type 2 diabetes (T2DM) are very different in India as well as in certain developing countries of Asia and Africa as compared to the West.[3- 5] Tripathy and Kar in 1965 drew attention to the variety of clinical types of DM and highlighted the

fact that 27% of elderly diabetics were lean.[4- 6] Nearly half a century later, there have been changes in the profile and presentation of diabetes, yet Type 2 DM-lean remains a distinct clinical entity. Its prevalence varies depending on type of population and ethnic origin.[6- 9]

The mean age of lean, normal and overweight diabetic subjects was 47.8 ± 13.1 years, 50.5 ± 12.2 years and 48.3 ± 2.4 years, respectively. The mean duration of diabetes in lean, normal and overweight subjects 2.9 ± 2.1 years, 3.1 ± 5.6 years and 5.0 ± 6.3 years, respectively. The mean BMI of lean, normal and overweight diabetic subjects was 18.3 ± 3.4 Kg/m^2,20.3 ± 6.7 Kg/m^2 and 27.5 ± 8.4 Kg/m^2, respectively. Total cholesterol levels of lean, normal and overweight diabetic subjects were 182.1±47.6 mg/dl, 180.23±43.9 mg/dl and 181.55±36.9 mg/dl, respectively. Triglyceride levels of lean, normal and overweight diabetic subjects was 184.23±79.5 mg/dl, 178.2 ± 81.4 mg/dl and 186.1 ± 77.7 mg/dl, respectively. Barma PB et al [5] evaluated 100 cases of lean type 2 diabetes mellitus (62 males and 38 females). The mean duration of diabetes was 51.7 months (range 5-180 months). The glycemic control was poor according to standard guidelines. The majority of them showed response to oral hypoglycemic agents. Secondary failure to oral hypoglycemic agents was seen in 27 patients. The prevalence of microvascular complications was much higher than macrovascular complications. Neuropathy was the commonest complication seen in 70%, followed by retinopathy in 25%. Only 12 patients had hypertension, one had coronary artery disease and two had cerebrovascular accident. Lipid profile was not significantly deranged in their patients.[8]

In the present study, hypertension was present in 15 lean subjects, 7 normal subjects and 28 obese subjects. Neuropathy was seen in 10 lean subjects, 5 normal subjects and 27 obese subjects. Hence; co-morbidities were significantly higher among obese patients. Jayakumari C et al[6]assessed the pattern of dyslipidemia and scope of ASCVD risk reduction in patients with diabetes by lipid management. Clinical, biochemical, and medication profiles of all patients with diabetes attending a tertiary diabetes care hospital over a 2-year period were collected. The prevalence of various lipid abnormalities was determined after excluding patients with thyroid dysfunction and those on lipid-lowering medications. Patients were stratified according to LDL cholesterol, HDL cholesterol, and triglyceride levels, and other clinical parameters were compared among the groups. The adequacy of statin treatment was assessed based on American Diabetes Association guidelines. Nine hundred and seventy-one patients were included. The prevalence of hyperlipidemia was 40.0%, of whom 14.6% were newly diagnosed. The most common lipid abnormality was elevated LDL cholesterol. Higher A1C and fasting blood glucose values were found to be associated with higher LDL cholesterol levels. Twenty-seven percent of patients with indications for treatment with statins were receiving them. Of those being treated with statins, 42.6% had an LDL cholesterol level ≥100 mg/dL. In South Indian patients with type 2 diabetes and fair glycemic control, high LDL cholesterol is the predominant lipid abnormality. There remains a huge potential for ASCVD risk reduction in this population if the knowledge practice gap is addressed.[9]

CONCLUSION

Overweight and obese individuals may experience advantages in glycaemic regulation through reductions in HbA1c levels; conversely, patients of lean and normal weight often present with more pronounced and challenging hyperglycemia that is harder to manage.

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