Profile of Patients with Diabetes Mellitus at Tertiary Care Hospital, Clinical Study

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Abstract

Introduction: In Diabetes mellitus, it is observed that there will be an increase in plasma glucose levels because of the failure in inhibition of hepatic glucose production in combination with reduction in uptake by tissues especially muscles. These occur due to combination of insulin resistance and inadequate insulin secretion by both liver and muscle failure to suppress plasma glucose.

Methodology: Data was entered using MS Excel (2010) and statistical analysis was done using SPSS software version 16. Statistical analysis was done by using percentages, mean values and standard deviation. All statistical analysis was carried out at 5% level of significance and p value <0.05 was considered as significant.

Results: The mean haemoglobin value was 11.11±1.94 g%. The fasting blood sugar and the post prandial blood sugar mean values were 157.52 ± 47.52 mg/dl and 226.34±56.93 mg/dl respectively. The HbA1c mean value was 7.94±0.54%. The serum creatinine and blood urea levels were 0.98 ±0.26 mg/dl and 31.28±12.56 mg/dl respectively.

Conclusion: Out of 90 patients, 47(52.2%) of patients were on OHA treatment and 43(47.8%) patients were on insulin.

Keywords: Diabetes mellitus; HbA1c; OHA.

Introduction

According to the International Diabetes Federation (IDF) Atlas guideline report, worldwide currently, there are about 352 million adults with impaired glucose tolerance and they are at high risk of developing diabetes in the future. In 2017, it was estimated that 425 million people (20–79 years of age) suffered from DM.[1]

In India the burden of diabetes has increased from 26 million in 1990 to 65 million in 2016. The prevalence of diabetes in adults aged 20 years or older has risen from numbers-5•5% (4•9–6•1) in 1990 to 7•7% (6•9–8•4) in 2016. In 2016, the prevalence was highest in Tamil Nadu and Kerala (high Epidemiological Tranition Level- ETL) and Delhi (higher-middle ETL), followed by Punjab and Goa (high ETL) and Karnataka (higher-middle ETL). About 6% of women and 8% of men age 15–49 had random blood glucose levels greater than 140 mg/dl.[2]

Diabetes mellitus is characterized by chronic hyperglycemia with disturbances of carbohydrate, fat, and protein metabolism resulting from defects in insulin secretion, insulin action, or both. When fully expressed, diabetes can also be recognized during less overt stages, mostly usually by the presence of glucose intolerance. The effects of diabetes mellitus include long-term damage, dysfunction, and failure of various organs, especially the eyes, kidneys, heart, and blood vessels.[3]

In Diabetes mellitus, it is observed that there will be an increase in plasma glucose levels because of the failure in inhibition of hepatic glucose production in combination with reduction in uptake by tissues especially muscles. These occur due to combination of insulin resistance and inadequate insulin secretion by both liver and muscle failure eto suppress plasma glucose. Three phases of Type 2 diabetes mellitus can be seen. In first phase, glucose level remains normal even in the presence of demonstrable insulin resistance because insulin levels are elevated. In second phase, insulin resistance worsens so that post meal hyperglycemia develops despite increased insulin concentrations. In the third phase, insulin resistance does not change but decline or decreased insulin secretion causes fasting hyperglycemia and overt diabetes.[4]

Hypersecretion of insulin leads to its resistance.[5] Majority of patients of Type 2 diabetes mellitus are obese and obesity is an important cause of insulin resistance, Also ,individuals with central pattern of obesity are more likely to have glucose intolerance, vascular disease, hyperlipidemia and hypertension a constellation of features which is termed as syndrome – X, also called Reevan's syndrome. Once even mild hyperglycemia develops, a final common pathway is entered that can lead towards further metabolic eterioration.[6]

Methodology

Study Design: Prospective study.

Inclusion Criteria

Patients diagnosed with diabetes mellitus, without any cardiac symptoms.

Exclusion Criteria

- Patients who are known cases of following diseases: Ischemic heart disease.
- Valvular heart diseases.
- Hypertension.
- Connective tissue disorder.
- Chronic renal failure.

Sample Size: Sample size was calculated assuming (p)=66% as the prevalence, 10 % margin of error, the minimum required sample size at 5% level of significance is 90 patients. Sample size was calculated using the formula:

Where p is the prevalence

q = 1-p

d is the margin of error.

$Z_{\alpha/2}$ is the ordinate of standard normal distribution at α% level of significance.

Materials For Data Collection: Case proforma and investigations as follows:

Investigations include,

- Complete hemogram
- FBS, PPBS
- HbA1c
- Complete urine examination
- Serum creatinine
- Blood urea
- ECG
- 2D Echo
- Chest X-Ray.

Data Entry And Analysis: Data was entered using MS Excel (2010) and statistical analysis was done using SPSS software version 16. Statistical analysis was done by using percentages, mean values and standard deviation. All statistical analysis was carried out at 5% level of significance and p value <0.05 was considered as significant.

Results

Table 1: Age distribution of patients.

Age group (in years)	Frequency (n)	Percentage (%)
≤30	3	3.3
31–40	23	25.6
41–50	14	15.5
51–60	23	25.6
>60	27	30.0
Total	90	100.0

Out of the total 90 patients, 27(30%) belonged to more than 60 years age group followed by 23(25.6%) each in age group 31–40 years and 51–60 years, 14(15.5%) in age group 41–50 years and least in age group <30 years, 3(3.3%). (Table 1)

Table 2: Gender distribution of patients.

Gender	Frequency (n)	Percentage (%)
Male	61	67.7
Female	29	32.3
Total	90	100

Out of 90 total patients, 61 (67.7%) were males and 29 (32.3%) were females. (Table 2)

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Table 3: Duration of DM.

Duration of DM (in years)	Mean ± Standard deviation
Male	7.17 ± 2.48
Female	8.22 ± 3.06
Total	7.54 ± 2.73

The mean duration of DM in male patients was 7.17 years and female patients was 8.22 years. (Table 3)

Table 4: Family history of DM.

Family history of DM	Frequency(n)	Percentage (%)
No	53	58.9
Yes	37	41.1
Total	90	100

There was family history of DM in 37(41.1%) of the patients. (Table 4)

Table 5: Habits in patients.

Habits	Frequency(n)	Percentage (%)
Alcohol	11	12.2
Smoking	20	22.2
Both alcohol and smoking	6	6.7
None	53	58.9
Total	90	100

Out of 90 patients, 20 (22.2%) patients had the habit of smoking, 11(12.2%) alcohol consumption and 6(6.7%) had both habits. (Table 5)

Table 6: Blood tests of patients.

Variables	Mean ± standard deviation	Range (min-max)
Hb (g%)	11.11±1.94	7.9-16.4
FBS (mg/dl)	157.52 ± 47.52	107–330
PPBS (mg/dl)	226.34±56.93	146–394
HbA1c (%)	7.94±0.54	6.9–9.0
Serum creatinine (mg/dl)	0.98 ±0.26	0.1–1.4
Blood urea (mg/dl)	31.28±12.56	15–75

The above table shows the blood tests mean values. The mean haemoglobin value was 11.11±1.94 g%. The fasting blood sugar and the post prandial blood sugar mean values were 157.52 ± 47.52 mg/dl and 226.34±56.93 mg/dl respectively. The HbA1c mean value was 7.94±0.54%. The serum creatinine and blood urea levels were 0.98 ±0.26 mg/dl and 31.28±12.56 mg/dl respectively. (Table 6)

Table 7: Treatment in patients.

Type of treatment	Frequency(n)	Percentage (%)
Insulin	43	47.8
OHA	47	52.2
Total	90	100

Out of 90 patients, 47(52.2%) of patients were on OHA treatment and 43(47.8%) patients were on insulin. (Table 7)

Discussion

In the present study, out of the total 90 subjects, 27(30%) belonged to more than 60 years age group followed by 23(25.6%) each in age group 31–40 years and 51–60 years, 14(15.5%) in age group 41–50 years and least in age group <30 years, 3(3.3%). Similarly, in a study done by Paul Poirier et al. 7 the patients belonged to 38–67 years.

More than half of patients, 61 (67.7%) were males and 29 (32.3%) were females in our study where as it was reverse in the study done by Kamil Ashour[8], where 56.29% were females and 43.70% were males and in the study done by T. K. V. Sharavanan et al[9] it was 60.8% males and 39.2% females.

In our study, the mean duration of DM in male patients was 7.17 ± 2.48 years and female patients was 8.22 ± 3.06 years, where as in the study done by Kamil Ashour8, it was 5± 2 in males and 6±2 in females and study done by Karan Jain et al.[10] it was 16.48±13.37.

The mean heat rate of the patients was 80.51 ± 7.32 beats/min in this study. Similarly, in a study done by Paul Poirier et al.[7], resting heart rate in normal patients were 67 ± 9, patients with impaired relaxation were 74 ± 12 and in patients with pseudonormalized pattern of LVDD it was 72 ± 10. The systolic blood pressure was 120.33±10.32mm of hg and diastolic blood pressure 74 ± 9.69 mm of hg in this study.

The mean fasting blood glucose levels were 157.52 ± 47.52 mg/dl, post prandial blood glucose levels were 226.34±56.93mg/dl in our study. Similarly, in the study done by Nikhil M Dikshit et al.[11] the mean fasting blood glucose levels were 180.8±78.41 and post prandial blood glucose levels were 231.8±86.95 and in the study done by Karan Jain et al.[10] the mean fasting blood glucose levels were 163.45 ± 15.95 and post prandial blood glucose levels were 221.59 ± 29.21.

In our study, HbA1c was 7.94±0.54 whereas in other studies it was higher; study done by Karan Jain et al.[10] HbA1c was 8.01 ±1.23 and in study by T. K. V. Sharavanan et al.[9] it was 9.59 ± 1.89.

The serum creatinine was 0.98 ±0.26 mg/dl and blood urea was 31.28±12.56mg/dl in our patients whereas in the study done by Karan Jain et al.[10], serum creatinine was 0.72 ±0.19 and blood urea was 22.06 ±3.84.

Conclusion

The mean duration of DM in male patients was 7.17 ± 2.48 years and female patients was 8.22 ± 3.06 years.

There was family history of DM in 37(41.1%) of the patients.

Only 20 (22.2%) patients had the habit of smoking, 11(12.2%) alcohol consumption and 6(6.7%) had both habits.

Majority of patients, 47(52.2%) were on OHA treatment and 43(47.8%) patients were on insulin.

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