A Retrospective Study of Clinical and Biochemical Profile in Geriatric Patients with Type-II Diabetes Mellitus

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ABSTRACT

AIM: The aim of the study was to evaluate the clinical and biochemical characteristics of geriatric patients with type 2 diabetes mellitus (DM) attending tertiary care teaching hospital, SVIMS, Tirupati. **OBJECTIVES**: To document clinical features, biochemical parameters and anti-diabetic medications received as per records. **METHODOLOGY:** This retrospective study was performed in Department of Endocrinology in SVIMS, Tirupati, over a period of 6 months. Demographic details, laboratory parameters and pharmacotherapy details were collected in the pre-designed annexure form. **RESULTS:** A total of 100 diabetic elderly patients were included in the study. Out of which 57 were men, 43 were women. Most of them were under the age group of 60-64 years followed by other age groups. 28 patients were having the diabetes duration of 11-15 years. Some of them were having diabetic complications (such as diabetic retinopathy, diabetic neuropathy, diabetic nephropathy). Among 100 patients, 32 patients were normal weight, 22 patients were overweight, 28 patients were obese-I, 18 patients were obese-II. About 85% of patients were having high lipid levels. Some patients were on Oral Hypoglycemic Agents (OHAS), some patients were using both Insulin & OHAS.**CONCLUSION:** The present study comprised of 100 elderly type 2 diabetic patients in which males were higher in number when compared to females, most of the patients were in the age of group of 60-64 years. Hypertension was the most common co-morbidity associated with DM followed by Coronary Artery Disease (CAD). Diabetic neuropathy was the most prevalent complication followed by Diabetic retinopathy and diabetic nephropathy. In this study 46% of the patients were obese. Most of the patients were on OHAS alone, some were on OHAS and Insulin combination therapy while very few were on insulin therapy alone. Dyslipidemia was present in 85% of the patients and the most common form of dyslipidemia was low HDL and high LDL.

INTRODUCTION

Diabetes mellitus is a group of metabolic disorders characterised by hyperglycemia. It is associated with abnormalities in carbohydrate, fat and protein metabolism and results in chronic complications including microvascular, macrovascular and neuropathic disorders. Approximately two-thirds of all diabetic cases have been diagnosed. [1] Type1 DM results from autoimmune destruction of beta cells. Although these form of DM usually occurs in children's and adolescents but can occur at any age. [2] whereas type 2 DM increases with age. [3] It is the long term complications of diabetes that are the main causes of morbidity & mortality. People with diabetes suffer more from cardiovascular and renal diseases than other people and diabetes is the principle cause of acquired blindness. Most people with diabetes do not die from metabolic crises such as ketoacidosis but from stroke, myocardial infarction and chronic renal failure. [4] DM is not a single disease entity but rather a group of metabolic disorders sharing the common underlying feature of hyperglycemia. Hyperglycemia in diabetes results from defects in insulin secretion, insulin action or most commonly both. One of the chief injuries arising from hyperglycemia is injury to vasculature, which is classified as either small vascular injury (microvascular disease) or injury to the large blood vessels of the body (macrovascular disease). The chronic hyperglycemia and attendant metabolic dysregulation of DM may be associated with secondary damage in multiple organ systems, especially the kidneys, eyes, nerves, heart and blood vessels. [5]. The percentage of elderly Indians is projected to rise to 9% by 2016. During 1999, 7% of Singapore's population was over the age of 65; however, by 2030, this will increase to 19%. [6] China has about 102 million elderly (those aged 65 and over) or over one-fifth of the world's elderly population. Moreover, the percentage of elderly in China is projected to triple from 8 to 24% between 2006 and 2050, to a total number of 322 million. From a global perspective, elderly will constitute one-third of total population of the world by the year 2050. [6],[7] Risk factors of DM includes Over Weight, Inactivity, Family history of diabetes, Age, Prediabetes, Gestational diabetes mellitus and Polycystic ovarian syndrome (PCOS)[8]. Patients with type 2 DM often present without symptoms, even though complications tell us that they may had type 2 DM for several years. The clinical presentations of DM includes polydipsia, polyphagia, dry mouth, polyuria, nocturia, Unexplained weight loss, Weakness, fatigue, Blurred vision, Peripheral neuritis, diabetic foot ulcers, ketoacidosis and Frequent infection.[1],[9] Diabetic retinopathy, Diabetic nephropathy, Diabetic neuropathy, Peripheral

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vascular diseases, Stroke and Heart diseases are common complications seen in uncontrolled DM.[10]

MATERIALS AND METHODS

A retrospective study was performed in Department of Endocrinology and Metabolism, SVIMS, Tirupati. In the study, the sample size taken was 100 diabetic patients and all the patient data is available in medical records. The study was performed for 5months with regular follow up. We included only type2 DM patients above 60 years as per ADA criteria, seriously ill patients and type 1 DM patients were excluded. Data was collected using a proforma Baseline clinical and demographic characteristics were obtained from all patients. Data collection included patient information as age, weight, height, diet habits. Statistical analysis was carried out using the statistics software version 2007. All data was entered and saved to excel software of Microsoft windows 7 and data cleaning was carried out by a professional statistician. Baseline demographic, clinical and laboratory data was summarized in the form of mean ± Standard Deviation for continuous variables, numbers and percentages for categorical variables. Graphic representations like bar graphs and pie charts were used for visual interpretations to analyze the data. There were no ethical issues as present study was a retrospective study based on existing patient medical records.

RESULTS

Gender distribution of the study population Out of 100 diabetic patients 57(57%) patients were males and 43(43%) patients were females. Males were found to be higher than females. Out of 100 diabetic patients the age distribution in study population 38 patients were under the age group of 60-64 years; 20 patients were under the age group of 65-69 years; 22 patients were under the age group of 70-74 years; 14 patients were under the age group of 75-79 years; 6 patients were under the age group of 80-84 years. The minimum age of the selected study population found was 60 years and the maximum was 84 years. The mean age of the study population was 68.52 ± 6.52. The mean age of males was found to be 68.95 ± 6.281, Mean age of females was found to be 67.93 ± 6.87. The minimum age in study was 60 years and the maximum age was 82 years. Out of 100 diabetic patients majority of them were having Hypertension (HTN) (85%) whereas 34% of the patients were having Cardio-vascular Diseases (CAD). In our study majority of patients have diabetes duration of 11 − 15 years, followed by 6 − 10 years remaining patients were having different years of

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duration. In the study we found that 36 patients were having Neuropathy, 25 patients were having Retinopathy and 18 patients were having Nephropathy as diabetic complications. Out of 100 diabetic patients, 32 patients were having normal BMI, out of which 16 were men and 16 were women. Mean BMI was found to be 25.59± 4.63kg/m2, 22 patients were under BMI category II, Out of which 15 were men and 7 were women. 28 were under BMI category III, out of which 18 were men and 10 wemen.18 were under BMI category IV, out of which 8 were men and 10 were women. The overall BMI status in the study population in percentage were obtained as 28% of males as normal BMI whereas 37% of females were having normal BMI. 26.3% of males were overweight whereas 16.20% of females were overweight. 31.50% of males were in Obese I category whereas 23.20% of females were in Obese I category. 14% of males were having obese II category and 23.20% of females were having obese II category.

Out of 100 diabetic patients, about 18 patients were having high levels of total cholesterol (>200mg/dL), out of which 10 were men and 8 were women. 41 patients were having high levels of triglycerides (>150mg/dL), of which 23 were men and 18 were women. 68 patients were having low levels of HDL, of which 38 were men (<40mg/dL) and 30 were women (<50mg/dL). 45 patients were having high levels of LDL (>100 mg/dL), of which 26 were men and 19 were women.

The following drugs were given to the patients in our study out of which 100 diabetic patients, majority of them 78% were on Metformin, 48% of patients were on Glimepride, 18% of patients were on Insulin, 8% of patients were on Acarbose, Voglibose and Pioglitazone respectively, 7% of patients were on Gliclazide, 4% of patients were on Glibenclamide and Glipizide respectively, 3% of patients were on Sitagliptin, 1% were on Miglitol and Tenegliptin each.

Among 100 diabetic patients, 78% of patients were using biguanides, 63% of patients were using sulfonylureas, 17% of patients were using α-glucosidase inhibitors, 8% were using thiazolidinediones and 4% were using DPP-4 inhibitors when population is grouped drug classes they used. 82% patients were on OHAS only, of which 38 were using single drug, 31 were using 2 drugs, 12 were on 3 drugs and one patient was on 4 oral hypoglycemic agents and 2% of patients are on Insulin therapy alone and 16% of patients are on Insulin with OHS therapy.

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DISCUSSION

In the study, we evaluated the clinical and biochemical profile of elderly patients with type 2 DM attending a tertiary care hospital and Majority of the patients fell under the age group of 60-64 years which relates with a study conducted by S. Puri et. al from Chandigarh, where 67.5% of the elderly diabetic patients were in the age group of 60-70 years. In our study, males (57%) were more in number compared to females (43%). In a study conducted by Jingyan Li et. al. on 3,725 subjects, females were higher in number compared to males whereas according to a study conducted by S. Puri et. al. with a sample size of 273, males (58%) outnumbered females (42%) this proves that males and females were most probably affected equally.

In our study, the mean of duration of follow up was 12 ± 6.4 years and mean of duration of diabetes was 12.95 ± 6.7 years whereas according to a study conducted by Alwakeel et.al, the mean of duration of follow up was 7.9 ± 4.6 years and the mean of duration of diabetes was 10.4 ± 7.5 years.

Hypertension was reported in 85% and 34% with CAD. In a study conducted by Umesh Kapil et.al, 70% of the geriatric patients were having HTN with DM. According to S. Puri et.al, 41.9% of elderly patients were having hypertension and 28.1% had CAD. So HTN is a most common comorbidity in DM patients followed by CAD.

In our study, neuropathy was the most common diabetic complication. 36% of patients were having neuropathy followed by 25% having retinopathy and 18% of patients having nephropathy which is quite similar to a study conducted by Sandeep Singh et.al, with a sample size of 50 patients in which neuropathy was most common (26%) followed by Retinopathy (26%) and nephropathy (22%).

However study conducted by Alwakeel et al. on 1952 cases, nephropathy was the most prevalent complication i.e. 32.1% of the patients were having nephropathy.

In our study males were found to be more in number (26) in obese category when compared to females (20) but in the study conducted by Sandeep Singh et.al, diabetic females overpowered diabetic males in being obese. According to our study, 46% of the patients were obese whereas 29.7% of patients were obese according to study conducted by S. Puri et.al.

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Our study showed that 82% of patients were on OHS therapy but only 2% of patients were on insulin therapy and 16% of the patients were on insulin with OHS therapy. A study conducted by Sandeep Singh et.al showed that 64% of the patients were on OHS while 5.4% were on insulin.

Dyslipidemia was present in 85% of the patients in our study. Overall the most prevalent form of dyslipidemia was low HDL and high LDL in both males and females. In a study conducted by Sandeep Singh et.al, 88% of elderly patients were dyslipidemic and the most prevalent form of dyslipidemia was high LDL and low HDL. According to this study, the most prevalent form of dyslipidemia in diabetic males was low HDL and in diabetic females, high LDL and high TG were noted.

CONCLUSION

The study concludes with 100 elderly type 2 diabetic patients in which males were higher in number when compared to females, most of the patients were in the age of group of 60-64 years.

Hypertension was the most common comorbidity associated with diabetes mellitus followed by CAD. Diabetic neuropathy was the most prevalent complication followed by Diabetic retinopathy and diabetic nephropathy.

46% of the patients were obese in this study. Most of the patients were on OHS therapy alone, some were on OHS and Insulin combination therapy while very few ie. 2% were on insulin therapy alone. Dyslipidemia was present in 85% of the patients and the most common form of dyslipidemia was low HDL and high LDL.

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