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PREVALENCE OF DIABETES MELLITUS WITH MAJOR COMPLICATIONS, THE EVALUATION OF RISK FACTORS AND TREATMENT STRATEGIES FOLLOWED IN A TERTIARY CARE HOSPITAL - A PROSPECTIVE OBSERVATIONAL STUDY

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ABSTRACT

This study was carried out to evaluate the prevalence, risk factors, major complications and treatment strategies in patients with diabetes and to determine what extent management of diabetes in a tertiary care hospital at Salem, Tamil Nadu. Total 100 diabetic patients were randomly selected during the month of November to April. The study group comprised of about 46% male and 54% female with varying risk factors including family history (38%), smoking (23%). Results showed deteriorating glycemic control with mean FBG (fasting blood glucose), PPG (postprandial blood glucose) and HbA1c level was 41% ± 150-200 mg/dl, 44%± 200-350 mg/dl and 45% ± 8-9 % respectively. The rates of diabetic complications were Coronary artery disease 10%, Stroke 4%, Atherosclerosis 3%, Retinopathy 18%, Nephropathy 6% and Neuropathy 6%.Proportion of patients on oral hypoglycemic agent (OHA), insulin and combination of insulin & OHA was 10, 10 and 53 percent respectively. Hence this study has given information about the demographic datas, the clinical outcome of 100 Type II diabetic patients. In conclusion the purpose of this prospective- observational study was planned to evaluate the current prevailing scenario of diabetes mellitus prevalence, risk factors, major complications and treatment strategies of patients in order to correlate with the findings of previous studies.

KEYWORDS: Type II Diabetes mellitus, Prevalence, Risk factors, Complications, Management.

INTRODUCTION

Diabetes Mellitus (DM) is a group of metabolic disorders characterized by Hyperglycemia, Glycosuria, Hyperlipidemia, Negative Nitrogen Balance and sometimes Ketonaemia, which is associated with abnormalities in carbohydrate, fat and protein metabolism and results in chronic complications including microvascular, macrovascular, and neuropathic disorders.

Type II Diabetes Mellitus accounts for 80-90 of all diabetes cases. This form of diabetes is characterized by insulin resistance and at least initially, a relative lack of insulin secretion. Most individuals with type 2 diabetes exhibit abdominal obesity which itself causes insulin resistance. In addition, hypertension, dyslipidemia, is often present in these individuals. This clustering of abnormalities is referred to as the "insulin resistance syndrome" or the "metabolic syndrome." Because of these abnormalities, patients with type 2 diabetes are at increased risk of developing macrovascular complications.[1]

India is considered to be the 'Diabetic capital of the world'. International Diabetes Federation (IDF) estimates the total number of diabetic subjects to be around 40.9 million in India and this is further set to rise to 69.9 million by the year 2025.The prevalence of Diabetes at different time periods in Tamilnadu in the year 1989 was 8.3%, this rose to 11.6% in 1995 and to 13.5% in 2000 later in the year 2003-2004 it is 14.3%. Thus within a span of 14 years the prevalence of Diabetes increased by 72.3%.[2]

The major acute complications of type 2 diabetes mellitus are: Hypoglycemia, Hyperglycemic crises, Diabetes Ketoacidosis (DKA), Hyperglycemic hyperosmolar state (HHS) and chronic complications including Microvascular complications (Diabetic retinopathy, Diabetic nephropathy, and Diabetic neuropathy) and Macrovascular Diseases (Cardiovascular diseases, Stroke, Peripheral Vascular diseases). The risk factors for type 1 diabetes are still being researched. However having a family member with type 1 diabetes slightly increases the risk of developing the disease. Environmental factors and exposure to some viral infections have been linked to the risk of developing type 1 diabetes. Several risk factors have been associated with type 2 diabetes and include Family history of diabetes, Overweight, Unhealthy diet, Physical inactivity, Increasing age, High blood pressure, Ethnicity, Impaired glucose tolerance (IGT), History of gestational diabetes, Poor nutrition during pregnancy. Type 2 diabetes mellitus is a progressive disorder that can be treated initially with oral agent monotherapy but will eventually require the addition of other oral agents and that in many patients; insulin therapy will be needed to achieve targeted glycemic levels.[3]

MATERIALS AND METHODS

A Prospective observational study was carried out over a period of six months in a tertiary care hospital at Salem, Tamil Nadu. A suitable data collection form was designed to collect and document the data. 100 consecutive patients of both genders above 18 years diagnosed with type 2 diabetes mellitus were selected for the study. Emergency care patients, Paediatric patients, mentally retarded patients, Type I Diabetes mellitus, Pregnant and lactating women were excluded from the study. Data's were collected from the case sheets of medical records. The patient was interviewed and data was taken about their diabetes including type of diabetes, level of complication, blood glucose reading, diabetes education, complications and diabetes management including medication, diet, exercises, and other activities. Patient base line characteristics such as age, sex, risk factors, family history of diabetes, duration of diabetes, medical history, and other health problem related to diabetes, therapeutic management socioeconomic status of the patients was recorded for each patient.
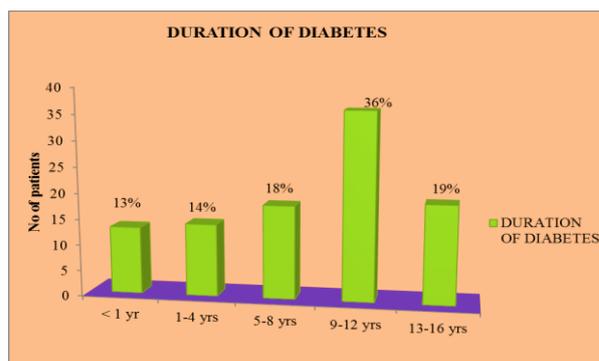
RESULTS

Prevalence of diabetes in different age groups

S. No	Age	Number of Male patients	Percentage (%)	Number of Female patients	Percentage (%)
1	35-45	6	13	5	9
2	46-55	11	24	17	31
3	56-65	21	46	27	50
4	66-75	8	17	5	10
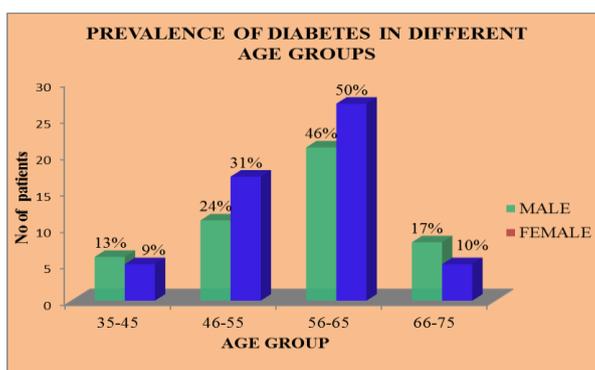
Distribution based on the Duration of diabetes

S. No.	Duration in years	No of cases	Percentage (%)
1	< 1 yr	13	13
2	1-4 yrs	14	14
3	5- 8 yrs	18	18
4	9- 12 yrs	36	36
5	13- 16 yrs	19	19

Variations in Blood glucose levels

S. No	Variables	Range (mg/dl)	No of patients	Percentage (%)
1	FBS	a) 150-200	41	41
		b) 100-150	36	36
		c) 100-130	23	23
2	PPBS	a) 200-350	44	44
		b) 180-240	32	32
		c) 160-190	24	24
3	HbA1c	a) 6-7 %	35	35
		b) 8-9%	45	45
		c) Not done	20	20

Assessments of Blood Urea and Serum Creatinine levels

| S. No	Variables	Range (mg/dl)	No of patients	Percentage (%)
1	Urea	a) 14-18	28	28
		b) 19-22	41	41
		c) 23-28	25	25
2	Creatinine	a) 0.4-0.6	51	51
		b) 0.7-0.9	43	43
		c) >1.4	6	6

Levels of Total Cholesterol, LDL and HDL

S. No	Variables	Range (mg/dl)	No of patients	Percentage (%)
1	Total cholesterol	130-200	43	43
		201-239	44	44
		>240	13	13
2	LDL	100-129	56	56
		130-159	28	28
		>160	16	16
3	DL	<40	43	43
		41-60	57	57
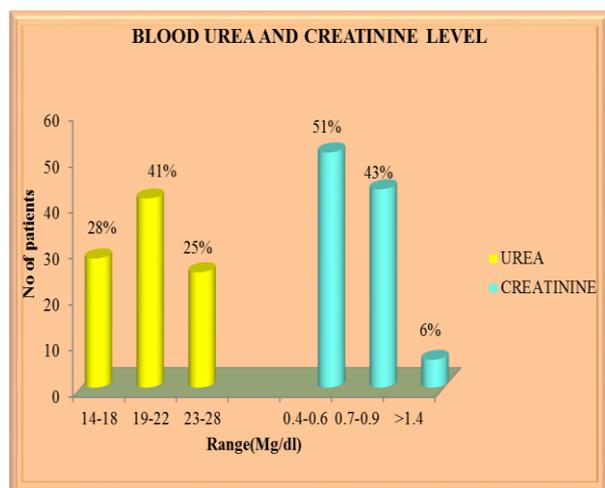
Levels of Triglycerides and VLDL

| S. No.	Variable	Range (mg/dl)	No of patients	Percentage (%)
1	Triglycerides	<150	48	48
		151-199	29	29
		>200	23	23
2	VLDL	5-20	56	56
		21-30	25	25
		>30	19	19
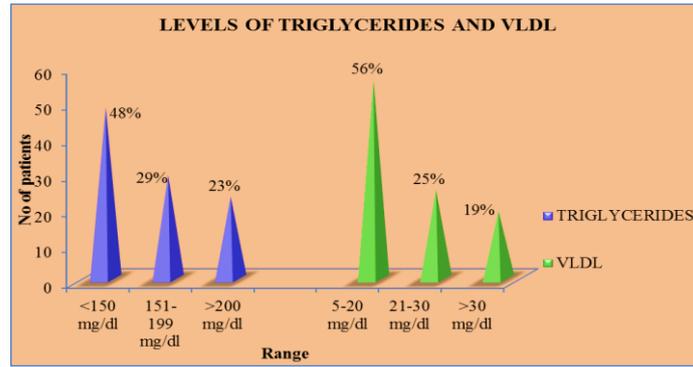
Association with other Co-morbid condition

| S. No	Co-morbid condition	No of male patients	Percentage (%)	No of female patients	Percentage (%)
1	Hypertension	12	26	23	43
2	Foot ulcer	6	13	3	6
3	Acid peptic disease	7	15	11	20
4	Bronchial asthma	5	12	3	6
5	COPD	9	19	2	4
6	No co-morbid condition	7	15	12	21
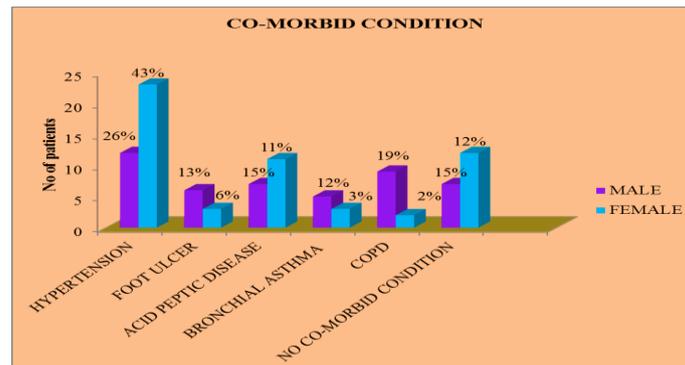
Distribution based on Complications

S. No.	Presence of complications	Duration of diabetes	No of cases	Percentage (%)
1	Coronary artery disease	13 yrs	10	10
2	Stroke	11 yrs	4	4
3	Atherosclerosis	16 yrs	3	3
4	Retinopathy	7 yrs	18	18
5	Nephropathy	15 yrs	6	6
6	Neuropathy	10 yrs	32	32
7	No complications		27	27
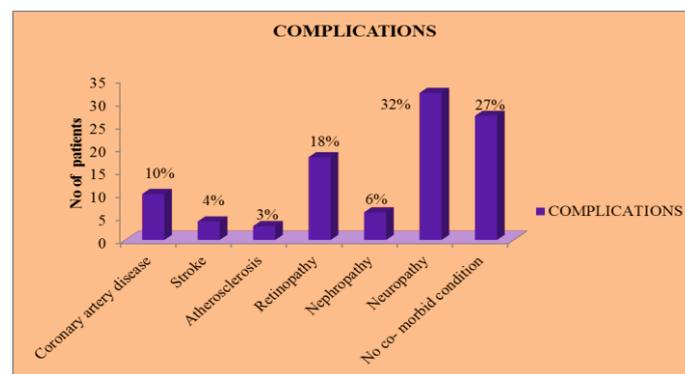
Distribution based on Treatment given

S. No.	Drugs prescribed	No of cases	Percentage (%)
1	Metformin alone	10	10
2	Metformin + Glimepride	44	44
3	Metformin + Glimepride+ Insulin	9	9
4	Metformin + Insulin	27	27
5	Insulin alone	10	10
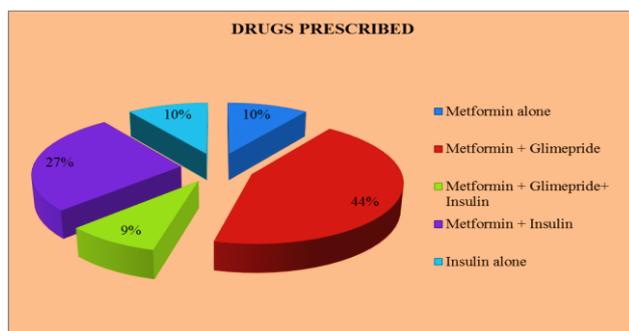
SUMMARY AND CONCLUSION

The mortality due to Diabetes was comparatively reduced than that happened in the past decades in India. This is due to active surveillance by the medical personals along the involvement of paramedical personals in preventing complications or treating the complications so that it doesn't progress.

A Prospective Observational study was done to analyse 100 Diabetic patients to find out the Prevalence, complications, Risk factors and Treatment strategies followed in VMKVMC&H, Salem, Tamilnadu.

Our study group comprised of 46% of males and 54% of females showing the prevalence of Diabetes is higher in females. Assuming the prevalence of Diabetes Mellitus in different age groups our study shows a marked increase in the prevalence of Diabetes between 56-65 years in both genders.

Duration of Diabetes Mellitus was directly proportional with the severity and the complication. Around 36% of our cases had long duration of diabetes for 9-12 years.

In our present study the patients glycemic targets has been taken into account and demonstrated that 41% of subjects has FBG level of 150-200 mg/dl, 44% of subjects has PPBS level of 200-350 mg/dl and 45% of subjects has HbA1C level of 8-9%.

Serum levels of Urea and Creatinine can be useful prognostic markers and predictors of renal damage in Diabetic patients. The duration and severity of Diabetes strongly correlates with serum urea level but not Creatinine level. In our study out of 100 patients 41% are having a urea level of 19-22 mg/dl, 28% with normal level of 14-18 mg/dl followed by 25% with higher level 23-28 mg/dl.

Diabetes is a dyslipedemic state where there is increase in the level of LDL, Triglycerides and decrease in the level of HDL which increases the risk of heart diseases and Stroke. In our study 44% of patients was having borderline cholesterol 201-239 mg/dl followed by 56 % of patients with LDL level of 100-129 mg/dl and HDL 57% patients with HDL level 41-60mg/dl.

The various Co-morbid conditions are distributed as 31% of Hypertension, 24% of Acid Peptic Disease, 7% of foot ulcer, 7% of Bronchial asthma and 4% of COPD.

The frequency of complications is Neuropathy 32%, Retinopathy 18%, Coronary artery disease 10%, Nephropathy 6%, Stroke 4%, and Atherosclerosis 3%.

The majority of patients receive oral hypoglycemic agents (OHA) that is Metformin + Glimepride for the management of their Diabetes. Some patients take combinations of OHA with Insulin 27% and 10% are taking Insulin alone.

A total of 100 subjects were monitored for possible adverse effects and the data showed that 45% has an episode of hypoglycemia 32% with headache and 20% with giddiness. Hence this study has given information about the demographic datas, the clinical outcome of 100 Type II diabetic patients.

Thus summarizing, this clinical study opens the basic platform for carrying out the cross sectional studies in this topic. Moreover multiple drug comparison trials can be done in this hospital population in the future related to diabetes.

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