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General Medicine

A CLINICAL STUDY OF MICROVASCULAR COMPLICATIONS IN A NEWLY DIAGNOSED DIABETES MELLITUS

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ABSTRACT

INTRODUCTION: Diabetes is characterized by asymptomatic phase between actual onset of hyperglycemia and clinical diagnosis , which has been estimated to last atleast 4-7 years .although microvascular complication do not occur at onset of disease, due to delay in diagnosis they are commonly present at the time of diagonosis.

AIM & OBJECTIVE: the study is to detect micovascular complications at the time of diagnosis

MATERIALS AND METHODS: Patients with Newly diagnosed Diabetes Mellitus presenting to department of general medicine ,ASRAM MEDICAL COLLEGE,ELURU, from 2017 to 2018. They presented to physician either for routine check up or have been admitted for some other illness and Diabetes by chance for first time .known cases of diabetes mellitus under treatment were excluded from study.

RESULTS : The total of 100 patients with newly diagnosed DM were studied out of which 60% were males and 40% females. the mean age duration was found to be55.26±20.24, 56 % of the patients presented with classical symptoms of DM,32% with symptoms due to microvascular complications and 12% were asymptomatic. 90% of newly diagnosed diabetics had positive family history. Out of 100 newly diagnosed diabetics 37% of the patients were overweight,41% were obese.27%of females had central obesity to compare to 14% in males.34% of the total patients had some infections at the time of diagnosed of DM with 10% of them having pneumonia and6% TB.36% of the patients presented with peripheral neuropathy at the time of diagnosed of DM with 29% of them having only symptoms of PN , 8%with only signs and 28% of them with both.22% of the patients had Retinopathy at the time of diagnosed of DM in which BDR is more common accounting for12%.10% of the patients had PPDR.32% of the patients had diabetic nephropathy at the time of diagnosed of DM with 28% of them having incipient nephropathy.

CONCLUSION: About 41% of the newly diagnosed diabetes had microvascular complications .hence microvascular complications at the time of diagnosed of DM were high in our patients who was found to be due to low sociology economic status, poverty and life style, signals physicians to have serious awareness about these unusual presentations and helps in concentrating on further evaluation and appropriate intensive control of diabetes to prevent further complications.

KEYWORDS : Microvascular complications, Diabetic Retinopathy, Diabetic Neuropathy, Diabetic Nephropathy, Diabetes mellitus, Micro albimunuria, Macro albimunuria, Obesity, Fasting plasma glucose, Post prandial plasma glucose.

INTRODUCTION

Diabetes Mellitus has become a global health problem due to rapidly increasing prevalence of obesity and physical inactivity. It is common and a serious disease with chronic complications and constitutes a substantial burden for both patient and health care system. Microvascular complications such as Diabetic Retinopathy, Diabetic Nephropathy and Diabetic Neuropathy are associated with considerable medical and economic impact among people with Diabetes.in UK prospective diabetes study(UKPDS0,37% of patients with newly diagnosed type2 diabetes developed at least one microvascular complication over a period of 10 years

AIM & OBJECTIVE

To Study the presence of various Microvascular Complications in Patients with Newly detected Diabetes Mellitus.

MATERIAL & METHODS

SOURCE OF DATA: Patients with newly diagnosed diabetes mellitus presenting to department of General Medicine, ASRAM Medical College, Eluru, from 2017 to 2018.They presented to physician either for routine check up or have been admitted for some other illness and Diabetes by chance for first time. Known cases of Diabetes mellitus under treatment were excluded from study.

SAMPLE SIZE: 100 cases

SAMPLE PROCEDURE: Cross sectional study

STUDY DURATION: 2017-2018

INCLUSION CRITERIA

Patients with newly diagnosed diabetes mellitus presenting to ASRAM Medical college,Eluru,criteria for establishing diabetes mellitus : 1.Fasting plasma glucose >126 mg/dl(7.0 mmol/dl),(Fasting is defined as no calorie intake for atleast 8hr). 2.Post prandial plasma glucose >200mg/dl92hrs after 75mg of oral glucose) 3. HbA1c 6.5%.the test performed in a laboratory using a method that is NGSP certified and standardized to the DCCT assay.

EXCLUSION CRITERIA

Patients with 1.Congestive cardiac failure.2.Urinary tract infection 3. Known hypertensives.4.fever. 5.Renal diseases. 6.other diseases causing peripheral neuropathy.

METHOD OF COLLECTION OF DATA

Detailed history regarding the symptoms of diabetes like polyuria, polydipsia,polyphagia and weightless were taken in detail.History of micovascular complicatons were taken in detail.

Peripheral neuropathy:Any history of tingling ,numbness,burning sensation or any sensory loss, Autonomic neuropathy: impotency and erectile failure,retention and incontinence of urine,impaired sweating, snoring, and sleep apnoea.

Diabetic Retinopathy: History of blurred vision,blackspots,floaters ,and sudden visual loss.

Diabetic Nephropathy: history of polyuria ,oliguria, puffiness of face, distension of abdomen and pedal odema.

RESULTS

- **Patients according to age and sex distribution**: out of total 100 patients with newly diagnosed diabetes,60% were males(60) and 40% were females(40). 44% of patients were within age of 45-54 yrs, 32% of them were within 35-44 yrs. So maximum number of

patients were clustered between 35-54 yrs of age(44% + 32% =76). Mean age duration was found to be 55.6+-20.24. one of the patients were above 8yrs.

- **Patients who were underweight or over weight and their percentage to BMI**:out of 100 newly diagnosed diabetics ,37% of the patients were over weight (28% males and 9% females. About 41% of them were obese(27% females and 14% males). 90% of the female patients were having increased BMI(67.5% obese and 22.55 overweight). Only 20% of the patients were having normal BMI (16% males and 4% females).
- **Patients who were having central obesity and their percentage according to waist hip ratio**: waist hip ratio was available for 99 patients ,30% males, and 27% females had central obesity . overall 57% of patients had central obesity at the time of diagnosis of diabetes mellitus . mean waist hip ratio was found to be 0.99+_0.08.
- **Patients who were presented with various infection**:34% of the patients at the time of diagnosis of diabetes mellitus had some infections9 24% males and 10% females). 2% of the patients had cellulitis, 45 of them had UTI, 2% of them had tuberculosis, 10% of them had pneumonia, and 25 had gluteal abscess.

Table :Showing total number of patients with peripheral neuropathy based on signs and symptoms

Peripheral neuropathy	Male	Female	Total
Only symptoms	17	12	29
Both signs and symptoms	16	12	28
Only signs	5	3	8

- Symptomatic peripheral neuropathy are more common than asymptomatic . 65% of the patients presented with peripheral neuropathy at the time of diagnosis of diabetes. 29% of patients (17% of males and 12% females) were presented with only symptoms of peripheral neuropathy, 8% of them were presented with only signs of peripheral neuropathy. 28% of them (16% males and 12% females) were having both signs and symptoms.

Table: Showing number of patients presenting with Retinopathy at the time of diagnosis

Retinopathy	Male	female	total
BDR	9	3	12
PPDR	6	4	10

- From the above data it is clear that BDR is more common than PPDR at the time of diagnosis. Totally 22%(12%males and 10% females) of the patients have retinopathy at the time of diagnosis)

Table: Showing number of patients with Diabetic nephropathy in patients with newly diagnosed diabetes mellitus.

Proteinuria	Male	Female	Total
Micoalbuminuria	12	16	28
Macroalbuminuria	2	2	4

- From the above data it is clear that 28% of patients presented with incipient nephropathy at the time of diagnosis. 4% of the patients had microalbuminuria. 24% of the patients were presented with Diabetic nephropathy at the time diagnosis of diabetes mellitus.

Table: Correlation of HbA1C in relation to microvascular complications.

HbA1C	Complications N (%)	Without complications(%)	Total
6.5-7.5	3(37.5)	5(62.5)	8
7.6-8.5	12(40)	18(60)	30
8.6-9.5	18(62.1)	11(37.9)	29
9.6-10.5	18(81.8)	4(18.2)	22
10.6-11.5	10(90.9)	1(9.1)	11
Total	61	39	100

- Statistical analysis of above obtained data reveals that patient with HbA1C >_8% have 4.4 times higher risk of developing microvascular complications than patients with HbA1c <-8%. This indicates HbA1c is a better predictor of microvascular complications in diabetes.

- **Patients who had lipid in the high risk at the time of diagnosis of diabetes mellitus**: hyperlipidemia under high risk category was almost equal in both males and females. Total cholesterol, HDL, LDL, cholesterol levels were higher in males than females under borderline risk, 24% of the patients had hyperlipidemia.
- **Blood urea and serum creatinine levels expressed in mg/dl**: Most of the patients had normal blood urea and serum creatinine levels. 25 patients had urea >40mg/dl. 2 patients had creatinine>2mg/dl. From the above data it is clear that significant increase in blood urea and serum creatinine levels which indicative of renal involvement is less common at diagnosis of diabetes mellitus.

DISCUSSION

- We studied newly diagnosed diabetic patients presented to medicine outpatient or admitted to ASRAM medical college and Hospital,Eluru ,Andhra Pradesh over a period of 2years. A total of 100 cases were studied.

- **Age**: the mean age(55.26+_20.240 in our study is closely related to the study of manishsirshat et al(56) and was slightly higher than study done by nambuya AP et al(45) and RP agarwal et al(50.7+_12. 4).

- **Sex**: the male to female ratio in our study (1.5:1) is higher when compared to study conducted by Vijayaviswanatha et al(1.38:1) and Nambuya AP et al but lesser when compared to weersuriya N et al(1.97:1).

- **Symptoms** : in our present study 56% of patients presented with classical symptoms of diabetes mellitus and 36% with weight loss. In studya conducted by Vsekar et al classical symptoms were 21% and weight loss was 47%.

- **Family history of diabetes**:in our study family history of diabetes was 50% and Nambuya AP study was 16%.it indicates that family history of diabetes is higher in indians.

- **BMI**: the mean BMI in the present study was 25.26+_8.85 and it was 27+_1.78 in a study by anandmosses CR while it was 28.5+_4.7 in the study by CathelineauG.The mean BMI was slightly less in the present study as compared to other studies.

- **Waist hip ratio**: In the present study ,W:H ratio of men is almost equal to other studies. there is a minimal difference in percentage of central obesity , it was 57% in present study and 21.3% in the study conducted by Weersuriya et al. In our study mean W:H was 0.99+_0.08 and it was 0.95+_0.05 in study of an and mosses CR et al and 0.99+_0.1 in Cathelineau et al study. The mean W:H was almost equal when compared to other studies.

- **Infections**: In our study percentage of patients who presented with infections (34%)were high when compared to study conducted by Nambuya AP et al(11.9%).the percentage of patients with diabetic foot in our study (9%) is less when compared to Gregory R et al study(10%) and higher compared to Nambuya AP et al(4%) and Nagaraj BV et al study(6.3%).the percentage of patients(2%) who had tuberculosis in our study was very high when compared to Nambuya AP et al (1.2%)and little lower compared to Manish Sirishat et al study(7.5%). In our study 10% 0f patients had pneumonia, 4% had UTI , 2% had cellulitis,2% had gluteal abscess, 45 had tubercular pleural effusion.it probably indicates that Indians with diabetes were prone for infections and tuberculosis was little high in indian study including present when compared to Nambuya AP et al study.

- **Microvascular complications**
- **Neuropathy**: The percentage of peripheral neuropathy(29%) and autonomic neuropathy(18%) was high in our study when compared to Ratzman KP et al (6.3%&7.3%)and parker AL et al. overall percentage of neuropathy(36%) was almost equal when compared to Nambuya AP et al (46.4%)and high when compared to Thompson TJ et al(9%) and Ramachandran A et al(14%)study.symptomatic neuropathy was present in 36% of patients in present study and 7% in sekar V et al and 30% in TripathiBB et al study. It was little higher when compared to study by Tripathi BB et al and very high compared to V sekar et al study

- **Retinopathy**: The percentage of patients who presented with retinopathy in our study(22%) was nearly equal when compared

to Rajiv Raman(18%)et al, and A Ramachandran et al(23.7%).it was more when compared to Thompson TJ et al(20%) and CathelineauG et al.

- **Nephropathy**: The percentage of overall nephropathy(32%) in present study was almost equal to Verinoca R et al(26%) and Cathelineau G et al(30%) . but it was higher than A Ramachandran et al(16.2%) and Thompson PJ et al(8%) study.the percentage of microalbuminuria in present study was nearly equal to CthelineauG et al was higher than Ramachandra A et al study.

- **Blood sugar levels**: The FBS(230.2+_23.1) and PPBS (279.9+_87.2) levels were high in our study than studies done by S S Murthy and Cathelineau G et al . in our study almost all patients had severe fasting hyperglycemia at the diagonosis.

- **Lipid profile**: The percentage of patients with hypercholesterolemia(16%) was higher in our study than Weersuriya et al(11%) and lower than SS Murthy et al(48%) study. The percentage of patients with hypertriglyceridemia(24%) was high in our study when compared to Weersuriya N et al(14%) and less compared to SS Murthy et al(25.9%).the percentage of patients with decreased HDL(11%) was almost equal in present study compared to Weersuriya N et al(12%)

CONCLUSION

- 41 out of 100 newly diagnosed diabetes mellitus was presented with microvascular complications.
- Neuropathy was found to be the commonest microvascular complication followed by diabetic neuropathy and diabetic retinopathy.
- More than 50% of the patients had microvascular complications at the time of diagnosis of diabetes mellitus.
- HbA1c is a better predictor of microvascular complications in diabetes.

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