



MICROALBUMINURIA AND ITS SIGNIFICANCE IN VASCULAR COMPLICATIONS IN DIABETIC PATIENTS RECEIVING ORAL HYPOGLYCEMIC DRUGS.

General Medicine

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ABSTRACT

INTRODUCTION: To determine the importance of detection of microalbuminuria in patients with diabetes mellitus (NIDDM).

METHODS: Hundred patients of diabetes (NIDDM) admitted to ASRAM Hospital, Eluru were studied. Patients were considered to be diabetic based on WHO criteria for diagnosis of diabetes. Detection of microalbuminuria was done using MICRAL test.

RESULTS: Prevalence of microalbuminuria (incipient nephropathy) was 37%. Mean age of onset of microalbuminuria was 51.7 ± 9.8 years. Maximum prevalence of microalbuminuria was found between age group of 60-80 years.

CONCLUSION: The incidence of microalbuminuria increases as duration of diabetes as evidenced by prevalence of 7.4% in 5 years. 50% in patients with duration between 5 to 10 years. 90% in patients with duration of 10-15 years and 100% in patients with diabetes of >15 years. Incidence of retinopathy 63.63%, neuropathy 46.66%, ischemic heart disease 60%, hypertension 74%, peripheral vascular 58% among microalbuminuric patients. There was significant relation between uncontrolled diabetes and microalbuminuria (51.36%)

KEYWORDS

Microalbuminuria: Diabetic Nephropathy, Retinopathy, Neuropathy.

INTRODUCTION:

Diabetes mellitus is characterized by metabolic abnormalities and by long term complications involving eyes, kidneys, nerves and blood vessels. The prevalence of diabetes is on the rise, more alarming in the developing nations. Moreover it is the leading cause of acquired blindness and accounts for 25 percent of cases with end stages renal failure as well as 50 percent of non traumatic lower limb amputations. Diabetic nephropathy occurs in 30% of insulin dependent diabetics and 25 percent of non insulin diabetics.

Diabetic nephropathy is an important cause of morbidity and mortality and is now is the most common causes of end stage renal failure. The presence of microalbuminuria precedes the development of overt diabetic nephropathy by 10-14 years. It is at this stage that one can hope to reverse diabetic renal disease or prevent its progression with therapeutic interventions which include intensified insulin treatment, dietary protein restriction, control of hypertension by ACE inhibitors and beta blockers.

AIMS OF THE STUDY:

• AIM OF OUR STUDY WAS

1. To evaluate significance of microalbuminuria in detection of incipient diabetic nephropathy and
2. To find out incidence of other microvascular Complications of diabetes in patients with microalbuminuria.

OBJECTIVES OF THE STUDY:

1. To find out the prevalence of microalbuminuria among non insulin dependent diabetic patients.
2. To find out the age of onset of microalbuminuria among non insulin dependent diabetic patient.
3. To find out the time of onset of microalbuminuria after diagnosing diabetes in an individual.
4. To find out the incidence of other microvascular complications of diabetes in patients with microalbuminuria.

MATERIALS AND METHODS:

1. 100 patients of diabetes (NIDDM) admitted in various medical wards of ASRAM Medical college were taken for the study from August 2018 to August 2019.
2. Patients were considered to be diabetic based on WHO criteria for diagnosis of diabetes.

• INCLUSION CRITERIA:

1. Patient detected to be diabetic for 6 months or more duration.
2. Urine sugar - positive
3. Fasting blood sugar >126mg/dl

4. Ophthalmic checkup.

• EXCLUSION CRITERIA:

1. Patients having overt albuminuria by albustic (combur) test i.e. >350mg/day
2. Patients with congestive cardiac failure, urinary tract infection, ketonuria.
3. Pregnant patients
4. Patients confined to bed for more than 2 weeks
5. Patients on ACE inhibitor therapy for hypertension
6. Patients with hypertension of more than 6 months

The patients taken for the study are subjected to following investigations:

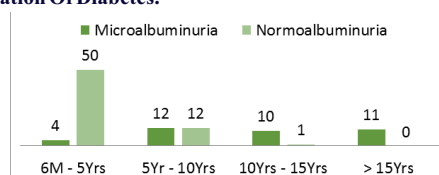
1. Microalbuminuria was estimated by Micral test.
2. Fasting Blood sugar and Post Prandial Blood sugar,
3. Blood urea,
4. Serum creatinine,
5. Serum cholesterol,
6. Urine Routine and culture,
7. Haemoglobin estimation,
8. Fundus examination and
9. Electrocardiogram.

RESULTS:

Table -1: Showing Prevalence Of Microalbuminuria In Relation To Duration Of Diabetes.

Duration of Diabetes	Total Number of Cases	Microalbuminuria	Normoalbuminuria
6 Months – 5 Yrs	54	4	50
5Yrs – 10 Yrs	24	12	12
10 Yrs – 15Yrs	11	10	01
> 15Yrs	11	11	00

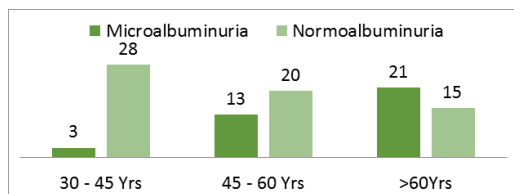
Graph -1: Showing Prevalence Of Microalbuminuria In Relation To Duration Of Diabetes.



- Mean duration of diabetes in microalbuminuric patient was 10.75 ± 5.0 years while in normoalbuminuric patient was 3.2 ± 2.0 years which is statistically highly significant.

Table-2: Relation Between Age Of Onset Of Diabetes And Microalbuminuria.

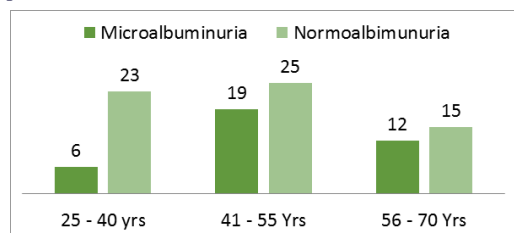
Age Of Onset (Years)	Total Number of Cases	Microalbuminuria	Normoalbuminuria
30 – 45	31	03	28
45 – 60	33	13	20
> 60yrs	36	21	15
Total	100	37	63

Graph - 2: Relation Between Age Of Onset Of Diabetes And Microalbuminuria.

- Age of diagnosis ranged between 28 - 70 years. mean age of onset of diabetes in microalbuminuric patient was 51.7 ± 9.8 years and in normoalbuminuric patient was 46 ± 11.6 years.

TABLE – 3: AGE AT DETECTION OF MICROALBUMINURIA

Age in years	Number of cases	Microalbuminuria	Normoalbuminuria
25 – 40	29	6	23
41 – 55	44	19	25
56 – 70	27	12	15
Total	100	37	63

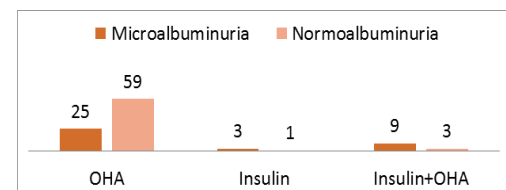
Graph – 3: AGE AT DETECTION OF MICROALBUMINURIA

Patients were in the age group of 28-70 years mean age at detection of microalbuminuria was 51.7 ± 9.8 .

- Mean age of patients with normoalbuminuria was 46 ± 11.6 .

TABLE – 4: MICROALBUMINURIA AND TREATMENT OF DIABETES

Diabetic Drugs	Number of cases	Microalbuminuria	Normoalbuminuria
O.H.A	84	25	59
Insulin	4	3	1
Insulin+OHA	12	9	3
Total	100	37	63

Graph – 4: MICROALBUMINURIA AND TREATMENT OF DIABETES

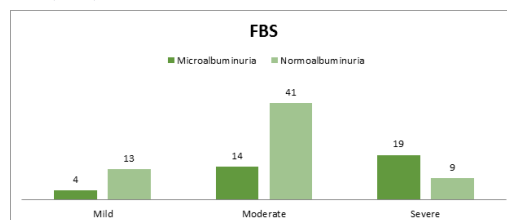
In present study out of 100 patients

- 84 patients (84%) were on oral hypoglycemic agents. Among them majority were (70.24%) with normoalbuminuria.
- 4 patients (75%) were on insulin. Among them 75% cases had microalbuminuria.
- 12 patients were on both insulin and OHA in which 9 were with microalbuminuria.

TABLE – 5: MICROALBUMINURIA IN RELTION TO SEVERITY OF DIABETES BASED ON FASTING BLOOD SUGAR (FBS)

FBS	Total No. Cases	Microalbuminuria		Normoalbuminuria	
		Number	%	Number	%
<150mg/dl	17	04	10.8	14	20.7
150 – 200mg/dl	55	14	37.8	41	65.0
>200mg/dl	28	19	51.4	09	14.3
Total	100.0	37	100.0	63	100.0

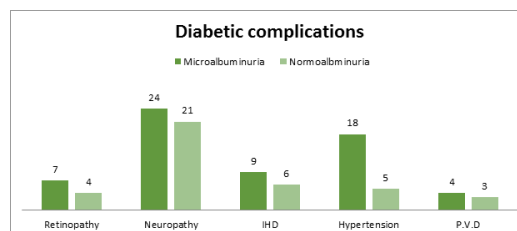
- Among microalbuminuric patients 19 patients had severe diabetes and 14 had moderate diabetes and 4 had mild diabetes.
- In normalbuminuric patients 9 had severe diabetes and 41 had moderate diabetes and 13 had mild diabetes.

Graph – 5: MICROALBUMINURIA IN RELTION TO SEVERITY OF DIABETES BASED ON FASTING BLOOD SUGAR (FBS).

- Average FBS was 218 ± 52.5 mgs% in microalbuminuric patients which is higher than normoalbuminuric patients (Average FBS 177.5 ± 28.9).
- Relationship between severity of diabetes and microalbuminuric was significant.

Table: 6 - Prevalance of various complications in relation to microalbuminuria.

Complication	Total Number of Cases	Microalbuminuria	Normoalbuminuria
Retinopathy	11	07	04
Neuropathy	45	24	21
IHD	15	09	06
Hypertension	23	18	05
PVD	07	04	03

Graph: 6 - Prevalance of various complications in relation to microalbuminuria

- All Microvascular complications were higher in microalbuminuric patients when compared to normoalbuminuric patients.

Table - 7: RELATION BETWEEN COMPLICATIONS AND SEVEARITY OF MICROALBUMINURIA.

	Mild(+) 20 – 50mg/l	Moderate(++) 50 – 100mg/l	Severe (+++) 100 – 300mg/l	Total
No. Of Cases	09	18	10	37
Retinopathy	01	04	02	07
Neuropathy	04	13	07	24
IHD	01	07	01	09
Hypertension	01	12	05	18
PVD	-	02	02	04

DISCUSSION:

- The present study included 100 cases of NIDDM excluding

- patients with other diseases causing microalbuminuria.
- The present study had NIDDM patients ranging from 30-87 years.
 - The mean age of diabetic in the present study was 49.02 years as against 54.7 years in the the study of C.S.Yagnisk et al.,
 - Hans Henrick51 Parving et al., in their study of prevalence of microalbuminuria in 1988 among 957 patients found high prevalence 22% for microalbuminuria
 - Prevalence of microalbumin in NIDDM patients using micral strip test by R.Ghai et al showed prevalence of 25%.
 - Prevalance is slightly higher in our study compared to Fabre et al, and
 - Parving and et al studies. But it is comparable with study by J.Sheth91 et al.,
 - In our study we found the chance of developing nephropathy increases with duration of diabetes as observed by prevalence of 7.4% in patients with known diabetes of duration 6 months to 5 years.
 - Mean duration of diabetes in microalbuminuria patient in present study is 10.7±5 years which is significantly higher than normoalbuminuric patients i.e., 3.2±20 years (P<.001).
 - This is in accordance with finding of Marshall and Alberti et al, Ghai and Verma et al, J. Sheth et al and M.S. Lumba et al.
 - However Parving et al and Guptha et al did not find statistically significat difference.
 - In our study microalbuminuria positive patients were diagnosed to have incipient diabetic nephropathy at the average age 51.7±9.8 years.
 - This is in par with the study conducted by C.E. Mongensen et al study in 1984(52years).
 - This is slightly more when compared to the study done by Hans Henric Parving et al in 1988 (41Years)
 - In our study we found fasting and postprandial blood sugar in patients were higher when compared to normoalbuminuric patients.
 - Various other studies by Knoll et al, Klien et al, Mongensen et al, Ghai, Verma et al found significant relationship between glycemia and microalbuminuria.
 - Our reuslts concur with those studies.
 - In our study 18 (73.91%) had hypertension. Highly significant positive correlation has been found.
 - Similar observation were made by Mongensen, C.E. Mongensen and Christenson, R.Ghai and et al, P.G. Raman et al and J. Sheth and et al.
 - In our study the patients with microalbuminuria had significnatly higher prevalence of all micro and macro vascular complications of diabetes.
 - In study by P.G. Raman et al, Bahia L86., Gomes M.B., et al Worn Nazaimoon W.M. et al87., Kutter M.K., McComb J.M., et al reported significnat higher prevalence of ischemic heart disease, hypertension and retinopaty in microalbuminuric patients
 - If the patient with positive micral test is not treated properly or is on irregular treatment for diabetes, the patient has a 20 times greater risk for developing clinical nephropathy than other patients.

CONCLUSION:

- We studied 100 NIDDM patients for detection of incipient diabetic nephropathy by estimating microalbuminuria.
- Prevalence of microalbuminuria was 37%.
- Maximum prevalence of microalbuminuria was found between age group of 60-80 years (36%).
- The incidence of microalbuminuria increases as duration of diabetes increases.
- Incidence of retinopathy is 63.63%, neuropathy 46.66%, ischemic heart disease is 60%, hypertension 74%, peripheral vascular disease 58% among microalbuminuric patients
- There was significant relation between uncontrolled diabetes and microalbuminuria (51.36%).
- The incidence of microalbuminuria was found to be 32.9% among male patients and 43.9% among female patients.
- We conclude microalbuminuria may be an indicator of incipient diabetic nephropathy.

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