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General Medicine

PREDICTORS OF DIABETIC RETINOPATHY IN PATIENTS WITH TYPE 2 DIABETES MELLITUS WITH NORMOALBUMINURIA

Seeni Mohamed Irsath — Assistant Professor, Department of General Medicine, Govt. Mohan Kumaramangalam Medical College, Salem

Sundaraj Ravindran — Professor, Department of Internal Medicine, Madurai Medical College.

ABSTRACT

AIMS AND OBJECTIVES: To estimate the prevalence of Diabetic Retinopathy in patients with Type 2 Diabetes Mellitus who have normoalbuminuria.

To study the predictors (Anemia, Duration of Type 2 Diabetes Mellitus, Hypertension) of Diabetic Retinopathy in patients with normoalbuminuria.

MATERIALS AND METHODS : This study was conducted among 100 patients with Type 2 Diabetes Mellitus attending Department of General Medicine in Govt. Rajaji Hospital, Madurai.This study is done in 100 type 2 diabetes mellitus patients. Patients are first performed renal function test and microalbumin in urine. Patients with normal renal function test and normoalbuminuria are selected.Then they undergo haemoglobin estimation, measurement of blood pressureand history of duration of type 2 diabetes mellitus are elicited.Now the patient undergoes fundus examination and screening for diabeticretinopathy is done.Then the prevalence of diabetic retinopathy and the predictors of diabetic retinopathy in patients with normoalbuminuria are calculated.

RESULTS: In our study, the diabetic retinopathy estimated prevalence in patients with normoalbuminuric type 2 diabetes mellitus is around 40%. Hence in normoalbuminuric type 2 diabetes individuals, presence of other predictors like anemia (Hb < 8 gms), systemic hypertension and longer duration of diabetes can identify the individuals with diabetic retinopathy which was statistically significant in our study.

CONCLUSIONS: In patients of type 2 DM, inspite of normoalbuminuria diabetic retinopathy is very much common. Absence of albuminuria should not be the criteria to defer for screening of diabetic retinopathy. Various predictors for the determination of DR are the estimated levels of haemoglobin, diabetes duration, and associated systemic hypertension. Hence, even in type 2 diabetes patients with normoalbuminuria, presence of other predictors like low haemoglobin, systemic hypertension and longer duration of diabetes can identify high risk individuals who develop diabetic retinopathy.

KEYWORDS : .Type 2 Diabetes Mellitus, Normoalbuminuria, Diabetic Retinopathy, Anemia, Systemic Hypertension, Longer duration of Diabetes.

INTRODUCTION

Diabetes mellitus, one of the important non communicable diseases in our. country and has become major health concern in recent times. Microvascular disease is a common complication in type 2 diabetes and diabetic retinopathy (DR) and nephropathy represent leading causes of visual impairment and end stage renal disease respectively in adults of both developed and developing world. Patients with type 2 diabetes may have Diabetic Retinopathy without microalbuminuria. Various studies have shown risk factors for DR that include hypertension, longer duration of diabetes and anemia. This has been supported by several studies reporting 10-30% prevalence of DR in type 2 diabetes with normoalbuminuria. Hence, early identification and correction of these predictors are necessary to avoid sight threatening complications due to diabetic
retinopathy.

METHODOLOGY:

This study is done in 100 type 2 diabetes mellitus patients.
Inclusion criteria:
Type 2 DM patients with:
Fasting plasma glucose level≥126 mg/dl or 2-hour post prandial glucose level >200 mg/dl
Patients treated with dietary modification alone or in combination with Oral hypoglycemic agents or insulin were also categorized as type 2 DM
Patients with Normoalbuminuria, which is defined as a urinary albumin excretion rate (UAER) <20 µg/min or <30 mg/g in 2 out of 3 tests taken within 2–3 months consecutively.
Normal Renal function Test

Exclusion criteria:

- Age <18 years or >80 years
- Dyslipidemias
- Hepatic failure
- Renal failure
- Smokers
- Thyroid dysfunction
- Acute systemic infection
- Exercise
- On treatment for anemia
- Pregnancy
- Malignancies
- Refractive errors

Patients are first performed renal function test and microalbumin in urine. Patients with normal renal function test and normoalbuminuria are selected. Then they undergo haemoglobin estimation, measurement of blood pressure and history of duration of type 2 diabetes mellitus are elicited.Now the patient undergoes fundus examination and screening for diabetic retinopathy is done.Then the prevalence of diabetic retinopathy and the predictors of diabetic retinopathy in patients with normoalbuminuria are calculated.
Tests done on patints were:

Laboratory investigations:
Hemoglobin estimation
Fundus Examination
Urine albumin
Renal function test
Liver function test
Lipid profile
RBC, PCV
Peripheral Smear

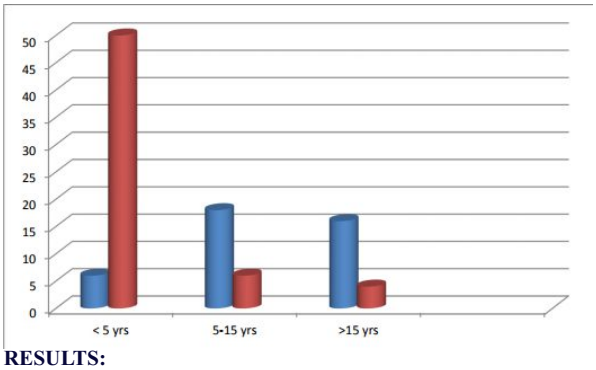
ANALYSIS:

SIMPLE STATISTICAL ANALYSIS

Diabetic retinopathy Incidence with Longer duration of Diabetes in study population (n = 100)

Hypertension	Diabetic retinopathy (Present)	Diabetic retinopathy (Absent)	Total
Stage 1	14	4	18
Stage 2	9	3	12
Total	23	7	30

Diabetic retinopathy Incidence with Longer duration of Diabetes in study population (n = 100)



RESULTS:

In our study, the diabetic retinopathy estimated prevalence in patients with normoalbuminuric type 2 diabetes mellitus is around 40%. Hence in normoalbuminuric type 2 diabetes individuals, presence of other predictors like anemia (Hb < 8 gms), systemic hypertension and longer duration of diabetes can identify the individuals with diabetic retinopathy which was statistically significant in our study.

DISCUSSION

Diabetic retinopathy is a specific microvascular complication related to sight threatening problem in diabetes. DR is characterized by progressive alterations in microvasculature of retina, leading to hypoperfusion of retina, increased vascular permeability and retinal vessels proliferation. Normoalbuminuria does not imply normal renal function. In type 2 diabetes mellitus, concordance rate with albuminuria and glomerular filtration rate is much less when compared to type 1 diabetes mellitus. Hence many type 2 diabetes patients may have decreased glomerular filtration rate, which itself is a risk factor for DR without albuminuria. Hence, even in type 2 diabetes patients with normoalbuminuria, presence of other predictors like low haemoglobin, systemic hypertension and longer duration of diabetes can identify high risk individuals who develop diabetic retinopathy. This study was conducted among 100 patients attended Department of General Medicine in Government Rajaji Hospital, Madurai. Gender distribution was almost equal with 52% were males and 48% were females, Most of the study group was in the age group of 35 to 65 years (67%), rest of the study group was at age groups 18-35 and 65-85 years (33%). Anemia of haemoglobin < 8 grams was present in 31 patients in the study group. Out of which 24 patients had diabetic retinopathy which was statistically significant with the 'p' value of 0.021.Systemic hypertension was seen in 30 patients in the study group. Out of which 23 patients had diabetic retinopathy which was statistically significant with the 'p' value of 0.028.In the study group, 44 patients had more than 5 years duration. Out of which 34 patients had diabetic retinopathy which was statistically significant with the 'p' value of 0.005.Even though type 2 diabetes mellitus patients have normoalbuminuria, they may still have diabetic retinopathy. Hence the other predictors of diabetic retinopathy like low haemoglobin, systemic hypertension, and longer duration of diabetes should be carefully monitored in every patient with type 2 diabetes for early identification and efficient treatment of diabetic retinopathy.

CONCLUSION

In patients of type 2 DM, inspite of normoalbuminuria diabetic retinopathy is very much common. Absence of albuminuria should not be the criteria to defer for screening of diabetic retinopathy. Various predictors for the determination of DR are the estimated levels of haemoglobin, diabetes duration, and associated systemic hypertension.

Hence, even in type 2 diabetes patients with normoalbuminuria, presence of other predictors like low haemoglobin, systemic hypertension and longer duration of diabetes can identify high risk individuals who develop diabetic retinopathy.

Large number of diabetic individuals could be anemic. Anemia identification and treatment will make a great change in the progression of diabetic complications like retinopathy.

By early identification and timely intervention of diabetic retinopathy, many sight threatening complications can be avoided.

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