**Ophthalmology**

# MICROALBUMINURIA AND LOW HEMOGLOBIN AS RISK FACTORS FOR THE OCCURRENCE AND INCREASING SEVERITY OF DIABETIC RETINOPATHY.

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**ABSTRACT** **AIM:** To assess the influence of urinary microalbuminuria and hemoglobin concentration on the occurrence and severity of diabetic retinopathy (DR).

**MATERIALS AND METHODS:** In this prospective cross-sectional study carried out over a period of 1 year, type 2 diabetic patients seeking ocular evaluation for DR were assessed for presence and severity of DR.

**RESULTS:** out of 100 patients were included in the study. DR of any grade was seen in 43 patients, Duration of diabetes (P < 0.001), microalbuminuria (P < 0.001) and low hemoglobin (P = 0.001) were found to be highly significant risk factors for the development and increasing severity of DR.

**CONCLUSION:** Microalbuminuria and low hemoglobin are strong predictors for DR, in type 2 diabetics., Although not directly involved in the pathogenesis, microalbuminuria can help in identifying patients at risk for more severe diabetic eye disease. Microalbuminuria warrants intensive monitoring of both retinal and renal status. The hemoglobin levels should be monitored regularly in diabetic patients to detect and treat anaemia so that we reduce one risk factor for DR.

## KEYWORDS :

## INTRODUCTION

- Diabetic retinopathy (DR) is a common ocular complication of DM and is considered to be one of the leading causes for visual loss and visual impairment globally.
- Diabetic retinopathy may also indicate and predict other diabetic complications.
- It is documented that more than 77% of patients who survive for over 20 years with DM are affected by retinopathy.
- CLASSIFICATION OF DIABETIC RETINOPATHY:



Various risk factors for diabetic retinopathy (DR) includes: Duration of diabetes ,Poor glycemic control, Hypertension, Hyp erlipidemia, Nephropathy, Anemia,Pregnancy.

## AIM:

To establish correlation of microalbuminuria and low hemoglobin in type 2 diabetics with the occurrence and increasing severity of Diabetic retinopathy.

## MATERIALS AND METHODS;
## STUDY DESIGN:
**PROSPECTIVE CROSS SECTIONAL STUDYSTUDY PER IOD:** August 2017

## TO JULY 2018.STUDY SETUP :
study was conducted in Depar tm ent of ophthalmology, Andhra medical college, Visakhapatnam.SAMLE SIZE : 100 patients.

## INCLUSION CRITERIA :
All patients with type 2 diabetes, which is defined as a fasting plasma glucose of more than or equal to 126 mg/dl or a 2-hour post glucose load plasma glucose of more than or equal to 200 mg/dl or a random plasma glucose of more than or equal to 200 mg/dl in the presence of symptoms of hyperglycemia.

## EXCLUSION CRITERIA:
All other posterior segment pathologies.coexisting ocular disorders like uveitis, opaque/hazy media.Recent intraocular surgeries (<6 months). Accelerated hypertension Active systemic infectionsPregnancy.

## METHODLOGY:
Patients satisfying the inclusion criteria were included for the study. Informed consent was taken from every participant. Identification data like Name, Age, Sex, Address, and Occupation were collected. A detailed history pertaining to the ocular complaint and history of any associated systemic illnesses was recorded. Best corrected Visual acuity of the patient was recorded, A detailed Ocular Examination was done which included Slit lamp Examination of the Anterior Segment ,followed by Examination of the Posterior Segment with 78D lens and Slit Lamp Biomicroscopy as well as Indirect Ophthalmoscopy. A thorough Systemic Examination was done.For purposes of analysis, patients were subdivided as mild-moderate nonproliferative DR (NPDR),severe NPDR and proliferative diabetic retinopathy (PDR). All the patients were subjected to the following investigations:24 hour albumin excretion.Haemoglobin concentration.Fasting and postprandial blood glucose levelsMicroalbuminuria was defined as urinary albumin excretion of 30-300mg/day.Hypertension was defined as Blood Pressure of >130/80 mmHg recorded at two different instances with a minimum interval of 6 hours in between the two recordings, with a manual Sphygmomanometer at the left arm in supine position, if the patient was not a diagnosed case of Hypertension.

## RESULTS:
Of the 100 participants in our study, There were 62 males and 38 females.The age of the patients ranging from 35 to 80 years.With mean age of the patients in the study was 56.4 years.The duration of DM ranged from 1 to 30 years, with a mean of 7.59 years.DR was found in 43 patients.Of these 43 patients with DR, 25(60%) had mild-moderate NPDR,9(20%) had severe NPDR and 9(20%) had PDR.

## MICROALBUMINURIA COMPARED WITH SEVERITY OF DR:

| microalbuminuria | Mild NPDR | Moderate NPDR | Severe NPDR | PDR |
|---|---|---|---|---|
| 30-100 | 25% | 16% | 2.3% | 4.6% |
| 100-200 | 7% | 7% | 7% | 2.3% |
| 200-300 | 4.6% | 4.6% | 11.6% | 13.9% |

With lesser ranges of microalbuminuria NPDR was more common whereas with larger amounts of microalbuminuria PDR was more common.

## Anaemia in comparison with severity of DR:

| HB% | Mild NPDR | Moderate NPDR | Severe NPDR | PDR |
|---|---|---|---|---|
| 12 or above | 11.6% | 7% | 2.3% | 2.3% |
| 8.1-11.9 | 18.6% | 21% | 16% | 18.6% |
| 8 or below | - | - | 2.3% | - |

With milder anemia ,NPDR was more common whereas with severe anemia PDR was more common.

The results were analysed using anova test, which showed statistically significant correlation noted between diabetic retinopathy and microalbuminuria and also with diabetic retinopathy and anemia

Risk factors like anaemia and microalbuminuria shows p value of 0.001 when comparewd with severity of diabetic retinopathy.

## DISCUSSION:

- In our study, there was a statistically significant association between microalbuminuria with the occurrence and severity of DR.
- An independent association between microalbuminuria and NPDR was observed in a study from Cameroon by Sobngwi et al.
- Larger cross-sectional studies have concluded that microa lb uminuria is a reliable marker for DR.
- However, a recent study from Thailand has found no significant association between retinopathy and microalb umi nuria.
- These findings support the suggestion that both DR and nephropathy progress in a parallel way. These findings stress on the need for close monitoring of DR in patients with microalbuminuria to prevent irreversible visual loss.
- In type 2 diabetes, microalbuminuria may not only be a marker of renal disease but also have a close association with generalized cardiovascular disease, increasing the risk of myocardial infarction or stroke.
- This study also established correlation between DR and low hemoglobin.
- Low hemoglobin was an independent baseline risk factor for the development of PDR and severe visual loss.
- Other studies have corroborated this finding and have also found improvement in the DR status following correction of anemia.
- Thus, the potential threat of anemia should always be taken into consideration while managing a patient with DR.

## CONCLUSIONS:

- We have observed a significant correlation between microalb uminuria and severity of DR, lower levels of hemoglobin and severity of DR.
- The presence of microalbuminuria should warn the treating physician of the need to monitor the retina along with kidney function. This in turn, may reduce the occurrence of irreversible visual loss due to DR.
- Low hemoglobin level, which is common in patients from developing countries like India, needs to be detected and treated, thereby reducing the risk for developing DR.

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