

# EFFECT OF DURATION OF DIABETES ON SEVERITY OF RETINOPATHY

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## ABSTRACT

**Background:** Diabetic retinopathy is a leading cause of blindness worldwide. The aim of this study was to know the effect of duration of diabetes on severity of diabetic retinopathy.

**Material & Methods:** This descriptive study was conducted at District Head Quarter Hospital Karak and Group of Teaching Hospitals Bannu from July 2007 to July 2010. Diabetic patients were divided into three groups in relation to diabetic age. Group A  $\leq 10$  years, group B 11-20 years and group C  $> 20$  years. Pupils were dilated and funduscopy performed with direct, indirect ophthalmoscopy and slit lamp indirect biomicroscopy.

**Results:** During the study period, 370 patients were seen with age range 35-80 years. Out of these 205(55.5%) were males and 165(44.5%) females. Eighty-nine (24.1%) patients had type 1 while 281(75.9%) type 2 diabetes mellitus. In group-A 185(86.04%) patients had normal fundi and 24 (11.16%) non-proliferative diabetic retinopathy and proliferative diabetic retinopathy in 6(2.79%). In group-B 39(33.33%) had normal fundi, 46(39.31%) non-proliferative and in 32(27.35%) proliferative diabetic retinopathy. In group-C no patient had normal fundi, 15(39.47%) non-proliferative and 23(60.52%) proliferative diabetic retinopathy. By applying  $X^2$  to comparing groups A with B and B with C p value was  $< 0.05$  and A with C p value was  $< 0.001$  showing significant and highly significant results.

**Conclusion:** Severity of diabetic retinopathy increases with increasing duration of diabetes.

**KEY WORDS:** Diabetic mellitus, Diabetic retinopathy, Diabetic age.

## INTRODUCTION

Diabetic mellitus (DM) is the leading cause of blindness. The gravity of the problem can be appreciated by the fact that diabetic patients are 25 times more prone to develop legal blindness as compared to non-diabetic.<sup>1</sup> The number of patients with DM is increasing due to population growth, aging and increasing prevalence of obesity and physical inactivity. This number is likely to rise from 171 million in 2000 to 366 million in 2030.<sup>2</sup> The Pakistan National Diabetic Survey results show that for each known case of DM there are approximately two cases of undiagnosed DM.<sup>3</sup> In Pakistan more than 10% of its adult population has DM.<sup>4,5</sup>

Among people with type 1 DM about 25% have diabetic retinopathy (DR) during the first 5 years and about 100% in two decades. In type 2 DM 21% have DR at diagnosis and more than 60% have DR during the 1<sup>st</sup> two decades of diabetic life.<sup>6,7</sup> DM reduces life expectancy by 1/3<sup>rd</sup> from the age of diagnosis.<sup>8,9</sup> It has been reported that proliferative diabetic retinopathy (PDR) and maculopathy are the most serious vision threaten-

ing complications of DM.<sup>10</sup> DR is a leading cause of blindness worldwide and is a micro vascular complication of DM characterized by increased vascular permeability and haemostatic abnormalities, that result in retinal non perfusion and neovascularization.<sup>11-14</sup>

The aim of this study was to know the effect of duration of diabetes on severity of diabetic retinopathy in respect of Non-PDR and PDR.

## MATERIAL AND METHODS

This descriptive study was conducted from July 2007 to July 2010 at District Head Quarter Hospital Karak and Group of Teaching Hospitals Bannu. A proforma was prepared for documentation of patients including age, sex, type of DM and duration of DM. Patients were divided in to three groups according to the duration of diabetes. Group A consisted of patients with diabetic duration  $\leq 10$  years, group B 11-20 years while group C  $> 20$  years.

The pupils were dilated with tropicamide eye drops and funduscopy performed with direct, indirect ophthalmoscopy and slit lamp indirect

**Table 1: Relationship of duration of diabetes mellitus to Retinopathy.**

Group	Diabetic Age	Normal Fundi	NPDR	PDR	Total
A	0-10 years	185 (86.04%)	24 (11.16%)	6(2.79%)	215
B	11-20 years	39 (33.33%)	46 (39.31%)	32 (27.35%)	117
C	>20 years	0	15 (39.47%)	23 (60.52%)	38

\*NDPR = Non-proliferative Diabetic Retinopathy, PDR = Proliferative Diabetic Retinopathy

bimicroscopy. The findings were documented as normal, non-proliferative diabetic retinopathy (NPDR) and PDR.

## RESULTS

A total of 370 patients with known DM were studied. Age range of patients was 35 to 80 years. Out of them 205 (55.5%) were males and 165 (44.5%) females. Eighty-nine (24.15%) had type 1, while 281 (75.9%) had type 2 DM.

In group-A 185 (86.04%) patients had normal fundi and 24 (11.16%) NPDR and 6(2.79%) had PDR. In group-B 39 (33.33%) had normal fundi, 46 (39.31%) NPDR and 32 (27.35%) PDR. In group-C no patient had normal fundi, 15 (39.47%) had NPDR and 23 (60.52%) PDR. (Table 1)

By comparing groups A with B, A with C and B with C in context of NPDR and PDR applying  $\chi^2$  the values obtained are important.  $\chi^2$  values became 4.20 ( $p < 0.05$ ) for comparison of A with B, 3.89 ( $p < 0.05$ ) B with C and 11.25 ( $p < 0.001$ ) A with C.

## DISCUSSION

DM affects 4% of the world population; almost half of them have some degree of retinopathy during the course of their disease.<sup>15</sup> DR occurs in both type 1 and type 2 DM. It has been shown that nearly all type 1 and 75% of type 2 diabetics will develop DR after 15 years of diabetic age.<sup>16,17</sup>

Our study shows that severe DR takes place after 10 years of diabetic age and prevalence of PDR increases with the increasing duration of DM. A study by Omolase et al reveals that the severity of DR increases with diabetic duration which is comparable to our study.<sup>18</sup> The results of our study are consistent with other studies showing that individuals who suffered from DM for a longer period of time are at high risk for developing DR.<sup>19-21</sup> Aiello et al found that after 20 years of diabetes almost all patients with type 1 DM developed DR while approximately two third of patients with type 2 DM developed DR,<sup>22</sup> which is comparable to our study. Irini et al in their study revealed that patients with longer diabetic age had severe DR.

This study reveals that 45.8% of patients who were diagnosed with DM for twenty years or more exhibit PDR on the contrary 88.9% of patients who have been diagnosed with DM for 0-5 years were free from DR,<sup>23</sup> which is comparable to our study. Diabetic age appears as meaningful predictor for DR and its severity.<sup>24-26</sup>

## CONCLUSION

Severity of diabetic retinopathy increases with increasing duration of diabetes.

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