

Prevalence of Diabetic Retinopathy in Quetta Balochistan

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Purpose: Early detection, to study the frequency, appropriate photocoagulation therapy and to educate masses at broader level.

Material and Methods: This study was carried out at department of Ophthalmology, Bolan Medical College / Helpers' Teaching Eye Hospital, Quetta from June 2006 to June 2008. All patients were known diabetic. About 2580 patients were selected for the study. All the patients, screened for diabetic retinopathy, had complete detailed history including family history. The investigations included Urine and blood sugar analysis both in fasting and random states. Every patient had complete ocular examination. It included visual acuity, refraction, slit lamp biomicroscopy, tonometry, ophthalmoscopy with both, direct, indirect ophthalmoscope and +90D lens. FFA and Fundus photography were done where it was necessary. The patients of proliferative diabetic retinopathy (PDR) and diabetic maculopathy were subjected to photocoagulation therapy. The patients with vitreous haemorrhage and tractional retinal detachment (TRD) were dealt by vitrectomy.

Results: Approximately 2580 patients were registered for study. Age group ranged between 22-75 years. Average age was 51 years. Among them 1497 (58%) were male and 1083 (42%) were females. About 582 patients were having IDDM while 1998 were NIDDM variety. Out of 2580 patients, 1410 patients were suffering from diabetic retinopathy. The male patients were about 59% (832) and female were 41% (578). 92% of patients presented with bilateral retinopathy and 8% with unilateral retinopathy. The relationship of retinopathy with duration was as under. It was 19% in 1-5 years duration, 27% in 6-10 years, 70% in 11-15 years, 82% in 16-20 years and 90% in more than 20 years duration period. 1652 eyes (61%) presented as Non-Proliferative diabetic retinopathy (NPDR) and 1056 (39%) as Proliferative diabetic retinopathy (PDR). Clinically significant macular edema (CSME) was seen in 677 eyes with NPDR and 216 eyes with PDR i.e. 893 eyes (33%). Vitreous haemorrhage was seen in 189 eyes (7%) and tractional retinal detachment in 54 eyes (2%), Neovascular glaucoma in 27 eyes (1%). Laser photocoagulation was done in 1056 eyes. Visual Acuity improved in 327 eyes (3%). It remained same in 507 eyes (48%) while it got worse in 222 eyes (21%).

Conclusion: In this hospital based descriptive study, diabetic retinopathy was more frequently seen in male individual.

- (a) The presentation of diabetic retinopathy was bilateral in majority of patients.
- (b) The prevalence of diabetic retinopathy was related with duration of diabetes. Non-Proliferative diabetic retinopathy (NPDR) was more frequent as compared to Proliferative diabetic retinopathy (PDR).

Laser photocoagulation improved vision in patients of diabetic retinopathy who had no vitreous haemorrhage and tractional retinal detachment.

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Diabetes mellitus is undoubtedly of an ancient origin¹. The history of diabetes mellitus is as old as medicine itself. In the Pre-Christian ERA, "the honey urine" was described by Su'srute in Hindu medicine and the flesh and the limbs to urine by Aretaeus of Cappadocia². The diabetes mellitus is one of major cause of blindness in the World.

In United States from 1980 through 1987, the annual prevalence of diabetes mellitus increased 9% from 24.4 to 27.6 / 1000 United States residents³.

According to WHO estimates in 1995, 4.3 million people in Pakistan had diabetes mellitus. It will swell up to 11.6 million by the year 2025⁴. According to Pakistan National Survey, overall prevalence of diabetes mellitus is 11.47%. The advanced age, inheritance, excessive caloric intake, obesity, less physical activity and various forms of stress are associated risk factors⁵.

Of all systemic diseases that affect eye, diabetes mellitus is the most common condition that leads to visual loss and blindness⁶. The diabetic retinopathy now ranks with glaucoma and senile macular degeneration as the leading cause of blindness in developing countries⁷. The prevalence of diabetic retinopathy is related to the duration of diabetes mellitus. It occurs particularly in 5th to 7th decade of life, 50% of cases appear between ages of 40 & 50 years, only 51% (This percentage needs correction) in first decade and 3% in eighth. The incidence of diabetic retinopathy is influenced by several factors like, age of onset of diabetes, the length of its duration, the control of glycosuria, and above all, on the diligence of observer in searching early lesion.

Vageners et al pointed out that prior to introduction of insulin; the incidence of diabetic retinopathy was 8.3%. Although after introduction of insulin, the life span of diabetic becomes long, but unfortunately the incidence of diabetic retinopathy has increased⁸. The incidence is 27% during first 5-10 years 71% if the duration is more than 10 years and 90-95% after 30 years⁹.

The diabetic retinopathy is classified as Non-Proliferative diabetic retinopathy (NPDR), Proliferative diabetic retinopathy (PDR) and clinically significant macular edema (CSME). Non-Proliferative diabetic retinopathy is described as mild moderate, severe and very severe. Proliferative diabetic retinopathy (PDR) is described as early, high risk and advanced. Macular edema is more common cause of visual blindness in diabetic patients¹⁰.

MATERIAL AND METHODS

This hospital based descriptive study was carried out at department of Ophthalmology, Bolan Medical College / Helpers Teaching Eye Hospital, Quetta from June 2006 to June 2008.

All the patients were selected from diabetic clinic which is held twice a week at department of Ophthalmology Bolan Medical College Quetta.

All the patients had detailed history and ocular examination. The history includes chief complaints, both systemic and ocular, were registered. Type and duration of diabetes were thoroughly noted. The associated risk factors like hypertension, obesity, family history, social history includes smoking and alcohol use were noted.

The method and frequency of blood sugar monitoring were assessed. Every patient had complete ocular examination. It included distance and near visual acuity assessment, refraction, slit lamp biomicroscopy, tonometry, fundoscopy - with direct and indirect ophthalmoscopy with 90D. Fundus Fluorescein angiography and fundus photography was done where it was necessary. The treatment modalities comprised of conservative treatment in non-proliferative diabetic retinopathy.

The laser photocoagulation was done in - Severe cases of PDR (PRP).

Clinically significant Macular grid pattern edema (CSME).

RESULTS

The age group ranged from 21-72 years of age and the average age was 51 years (Table 1). Total 2850 diabetic patients were studied. All were known diabetics. Among them 1998 had NIDDM and 582 patients had IDDM variety (Table 2). The male patients were 58% (1497) while female patients were 42% (1083) (Table 3). The number of diabetic retinopathy patients was 1410 (Table 4). Among them 59% (832) were male and 41% (578) were females (Table 5). The presentation of retinopathy was bilateral in 1298 (92%) patients including 792 male (61%), 506 female (39%) and unilateral in 112 patients (8%), 75 male (58%), 47 female (42%) (Table 6).

The relationship of duration of diabetes with diabetic retinopathy was as follows. It was 19% during first 1-5 years, 27% in 6-10 years duration, 70% in 11-15 years, 82% in 16-20 years while it was 90% in patients above 20 year of duration of diabetes. (Table 7).

Table 1. Age distribution of patients studied (n = 2580)

Age group	21-72 years
Average age	51 years

Table 2. Total number of patients studied with distribution of types of diabetes mellitus (n = 2580)

Type of Diabetes	No. of Patients n (%)
IDDM	582 (33)
NIDDM	1998 (77)

Table 3: Sex Distribution (n = 2580)

SEX	No. of Patients n (%)
Male	1497 (58)
Female	1083 (42)

Table 4. Number of Diabetic Retinopathy patients (n =1410)

Number of patients studied	2580
Number of diabetic retinopathy patients	1410 (55%)

Table 5. Sex distribution of Diabetic Retinopathy patients (n = 1410)

Male Patients	832 (59%)
Female Patients	578 (41%)

Table 6. Mode of Presentation (n = 1410)

Mode	No. of Patients n (%)
Bilateral	1298 (92)
Unilateral	112 (8)

Among 2708 eyes of 1410 patients, the non-proliferative diabetic retinopathy (NPDR) (Fig. 1) was seen in 1652 eyes (61%), proliferative diabetic retinopathy (PDR) (Fig. 2) in 1056 (39%) eyes, clinically significant macular edema in 892 eyes (33%) including 677 eyes with NPDR and 216 with PDR (Table 8) (Fig. 3).

Advanced diabetic eye disease was seen with Proliferative retinopathy, vitreous haemorrhage in 189 years (7%), tractional retinal detachment in 54 eyes (2%) and Neovascular Glaucoma in 27 eyes (1%) (Table 9). Laser photocoagulation was done in 1056 eyes. PRP was carried out in severe cases of PDR (Figure-4) while in clinically significant macular edema, grid pattern done. The visual acuity improved in 327 eyes (31%), it remained same in 507 eyes (48%) while it got worse in 222 eyes (21%) (Table 10).

Table 7. Relationship of duration with Diabetes Retinopathy (n = 1410)

Duration	DM (Patients)	DR (Patients)	Age n (%)
1-5 years	572	108	19
6-10 years	655	177	27
11-15 years	449	349	70
16-20 years	436	356	82
20 and above	468	420	90

Table 8: Clinical Presentation (n = 2708)

Status	No. of Eyes n (%)
Total number of eyes	2708
Non-Proliferative diabetic retinopathy (NPDR)	1652 (61)
Proliferative diabetic retinopathy (PDR)	1056 (39)
CSME	893 (33)
CSME & NPDR	677 (25)
CSME & PDR	216 (08)

Table 9. Advanced diabetic eye disease

Disease	No. of Patients n (%)
Vitreous haemorrhage	189 (7)
Tractional retinal detachment	54 (2)
Neo Vascular Glaucoma	27 (1)

Table 10. Visual outcome after Laser Photocoagulation (n = 1056)

	No. of Patients n (%)
Same	507 (48)
Improved	327 (31)
Detoriated	222 (21)

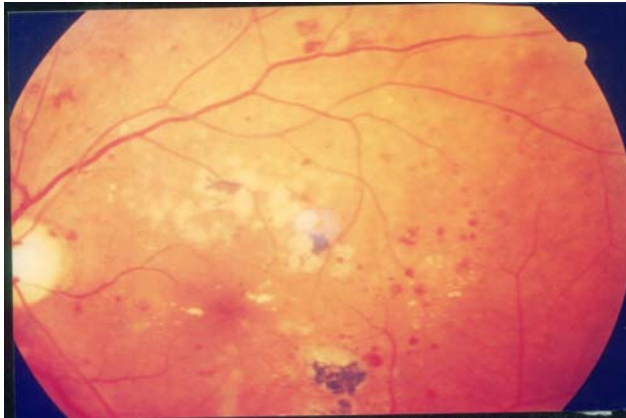


Fig.1: Fundus photograph showing NPDR

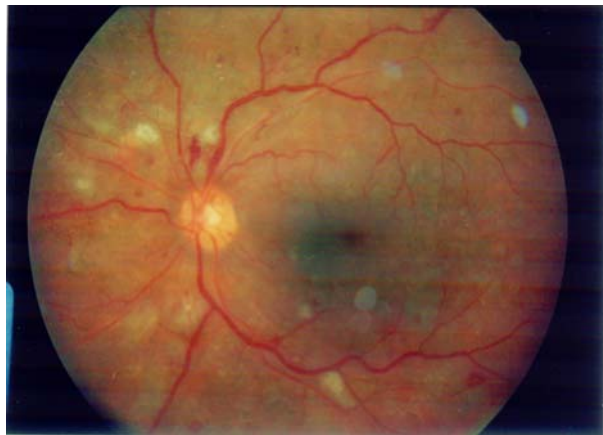


Fig. 2: Fundus photograph showing NVD (PDR)

DISCUSSION

In this hospital based descriptive study, Total 2850 patients were registered to assess the prevalence of diabetic retinopathy. Diabetic retinopathy is one of a major complication of diabetes mellitus which affects the retinal blood vessels and leads to blindness. About 4-8 million diabetics exist in Pakistan and very little work has done on complication of diabetes mellitus. The age group included in this study was 21-72 years; it shows that diabetic retinopathy is commonest cause of legal blindness in this age group. It is also reported by the Italian diabetologist Grassi¹¹. In our study, the

prevalence of diabetic retinopathy was about 55% (i.e. 1410 patients out of 2850 patients). It was higher among males (59%) as compared to females (41%); the male preponderance has also been reported by Kayani and her colleagues in their study at Lahore¹².

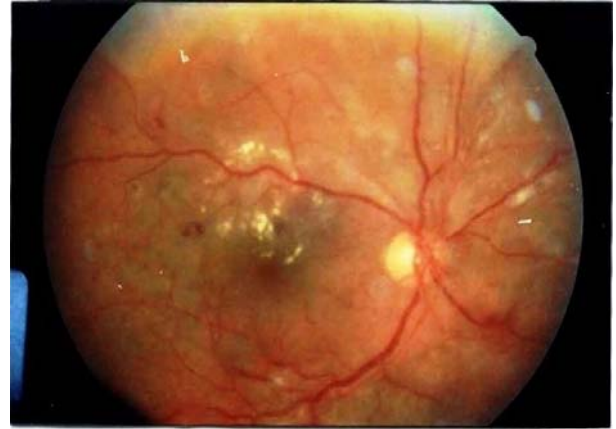


Fig. 3. Fundus photograph showing severe PDR with diabetic maculopathy

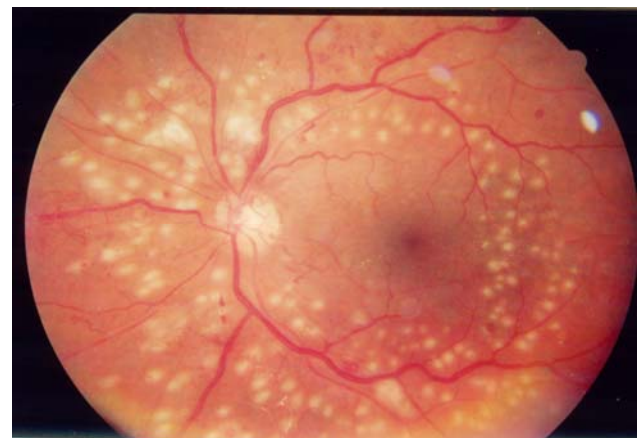


Fig. 4. Fundus Photograph showing PRP

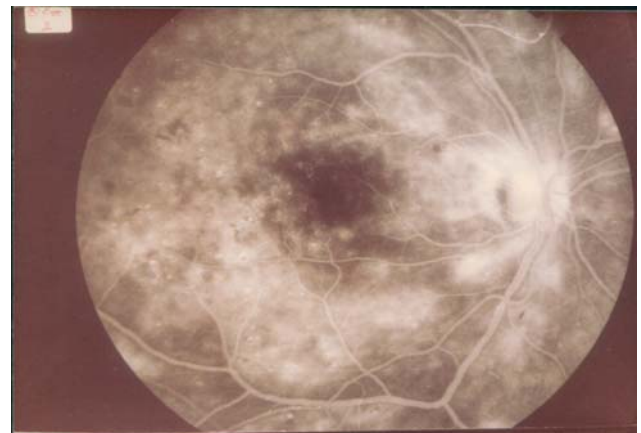


Fig. 5. Angiogram showing CSME

The diabetic retinopathy is bilateral disease. In our study, 1298 (92%) individual out of 1410 presented with bilateral disease and 112 (8%) with unilateral disease.

The incidence of diabetic retinopathy is influenced by duration of diabetes. At our centre, it was 19% (i.e. 108 out of 572 patients) in 1-5 years duration, 27% (177 out of 655) in 6-10 years duration, 70% (349 out of 449) in 11-15 years duration, 82% (356 out of 436) in 16-20 years duration, and 90% (420 out of 468) in above 20 years duration.

This relationship is also studied and reported by Akhter Jamal Khan in 1986 at Akhter Eye Hospital Karachi¹³. The report shows prevalence and duration of diabetic retinopathy in 1000 patients. The incidence and relationship of diabetic retinopathy with duration of diabetes is also mentioned in their report by Klein R, Klein BEK, Moss at al (Needs reference number).

The non-Proliferative diabetic retinopathy (NPDR) was present in (61%) of eyes, Proliferative diabetic retinopathy (PDR) in 39% eyes. This shows NPDR is more common as compared to PDR. This also has been reported by Kayani and her colleagues in their study¹². Clinically significant macular edema (CSME) was seen in 893 eyes (33%). CSME was seen in 677 eyes with NPDR and 216 eyes with PDR. Leske and his colleagues have reported the incidence of CSME 8.7% in their study at Stony Books University New York¹⁴.

Laser photocoagulation was performed in 1056 eyes. It was performed in eyes with severe bilateral NPDR showing extensive capillary non-perfusion on fundus fluorescein angiography (FFA), Proliferative diabetic retinopathy (PDR) and clinically significant macular edema (CSME). The photocoagulation maintains/stabilizes VA but not improve it¹⁵. According to visual outcome, the visual acuity remained same in 48% (507 eyes), improved in 31% (327 eyes) and deteriorated in 21% (222 eyes)¹⁶. It shows that timely laser photocoagulation obviates visual loss in diabetic retinopathy¹⁷. Prevention of blindness in patients with diabetic retinopathy, by appropriate laser therapy has been acknowledged as one of the most significant advances in medical history. The credit of these retinal disease trials goes to DRS¹⁸. We in ophthalmology think that information is widespread but we are misleading ourselves. It is our duty to see the facts about diabetic eye disease and its treatment are conveyed to the public on large scale for their maximum benefit¹⁹.

It is important to identify retinopathy in early stages, before there is irreversible damage. Screening of diabetic retinopathy is best undertaken by ophthalmologist because of complex diagnostic techniques involved and subtlety of the many of the physical signs. Indeed both retinal edema and ischaemia require special technique for their identification. This result is posing to training and staffing considerable problems in relationship majority of the population is not even aware of the ophthalmic care. The physicians also ignore this aspect and have poor information regarding the laser treatment of diabetic retinopathy¹⁹.

CONCLUSION

In this hospital based descriptive study, we conclude that the prevalence of:

1. Diabetic retinopathy is related with duration of diabetes.
2. The diabetic retinopathy was more frequently seen in male individuals.
3. Non-Proliferative diabetic retinopathy (NPDR) was more frequent as compared to Proliferative diabetic retinopathy (PDR).
4. Laser photocoagulation improves the vision in those patients:
 - a. Those who were treated in early stages of disease.
 - b. Those who had no vitreous haemorrhage.
 - c. Those who have tractional retinal detachment.
5. The presentation of diabetic retinopathy was bilateral in most of patients.
6. The incidence of diabetic retinopathy is increased as the duration of diabetes in enhanced.

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REFERENCE

1. **Assal JPH, Froesch FR.** The Pancreas, IN: Lablax A (ed). Clinical Endocrinology. Theory and practice, 2nd ed. Berlin, Springer Verlag. 1986; 749.
2. **Elder SD, Dobree JN.** Diseases of retina. In: Systems of Ophthalmology Steward Duke Elder (ed). Vol.10 - CV mosby, ST Louis. 1958; 422-3.
3. **MMWR.** Prevalence, incidence of diabetes mellitus, United States, 1980-1987. JAMA. 1990; 264:3126.
4. **Ahmed MM:** Diabetes Mellitus. Editorial: Pak J Ophthalmol. 2002; 18: 90.
5. **Kahn HA, Hiller, R.** Blindness caused by diabetic retinopathy. Am J Ophthalmol. 1974; 78: 58.
6. **G.O.H Naumann DJ.** Diabetes mellitus. In; Apple pathology of the eye. 1st ed. Springer Verlag. New York. 198; 875.
7. XIII Congress of the Asia - Pacific Academy of Ophthalmology May 12-7-1991 [Abstract]. International Congress Series 972. (Mendius AV, Colombo, Srilanka) Session 1921.
8. **Elder SD Dobree JH.** Diseases of retina. In: Systems of Ophthalmology edited by Sir Stewart Duke-Elder. Vol 9. CV. Mosby Co, ST Louis. 1958; 408-40.
9. **Klien R, Klein BEK, Moses SE et al.** The Winconsin epidemiological study of diabetic retinopathy. III Prevalence and risk of diabetic retinopathy when age is 30 or more years. Arch Ophthalmol. 1984; 102: 527-32.
10. **Kanski JJ.** Retinal vascular disorders. IN: Clinical Ophthalmology: A systemic approach 5th ed. Butter Worth and Co; Hong Kong. 572.
11. **Grass G.** Diabetic retinopathy. In Minerva Med. 2003; 94: 419-35.
12. **Kayani H, Rehan N, Ullah N.** Frequency of retinopathy among diabetes admitted in a teaching hospital of Lahore In: Ayub Medical College Abbottabad. 2003; 15: 53-6.
13. **Khan AJ.** Diabetic blindness; a preventable disease. Pak J Ophthalmol. 1988; 4: 7.
14. **Leske MC, WU YY, Henni SA et al.** Barbados Eye Study Group. In nine year study of diabetic retinopathy in the Barbados Eye Studies. Arch Ophthalmol. 2006; 124: 250-5.
15. **Sinclair SH, Del Vecchio.** The Internet's role in managing diabetic retinopathy: Screening for early detection. Cleve Clin J Med. 2004; 71: 151-9.
16. **Fennis FL.** How are effective treatment for diabetic retinopathy?. JAMA. 1993; 269: 1290-7.
17. **Nwosu SN.** Diabetic retinopathy management update. Niger Postgra. Med J. 2003; 10: 115-20.
18. Early Treatment Diabetic Retinopathy Study Research Group. ETDRS Report No.9. Ophthalmology. 1991; 98: 766-85.
19. **Witkin SR, Klein R.** Ophthalmological care for persons with diabetes. JAMA .1984; 251: 25-34.

A change in the appearance of optic disc may be the first detectable sign of glaucoma damage.

Characteristic configuration of neuroretinal rim is known as the = ISNT RULE = broadest in the inferior region, followed by the superior, nasal and temporal regions. Document the appearance of disc changes by making a sketch or taking a photograph.

Prof. M. Lateef Chaudhry
Editor in Chief