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FREQUENCY OF DIABETIC RETINOPATHY IN PATIENTS WITH TYPE 2 DIABETES MELLITUS: A CROSS-SECTIONAL STUDY FROM A TERTIARY CARE HOSPITAL IN QUETTA, PAKISTAN

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Abstract

Purpose: *To identify the frequency of diabetic retinopathy (DR) in Type 2 Diabetes Mellitus (T2DM) patients in a tertiary care facility in Quetta, Balochistan.*

Study design: *Descriptive, cross-sectional study.*

Place and Duration of Study: *Department of Medicine, Bolan Medical College / Hospital, Quetta, within six months after the synopsis approval.*

Methodology: *155 patients of 25 to 65 years old who are diagnosed with T2DM (duration) were considered. Non-probability consecutive sampling was used for period of six months. Patients who had ocular trauma, or had undergone ocular surgery before, or who had a glaucoma, hypertension, or severe cataracts were not included. Extensive fundoscopies were conducted by consultant ophthalmologist following the pupil dilating using 1% tropicamide. According to the classification by Davis, DR was divided into Non-Proliferative (NPDR) and Proliferative (PDR) stages. The SPSS version 25.0 was used in data analysis.*

Results: *According to the epidemiological trends in different regions, the anticipated rate of DR among this cohort is 22.0%-30.0%. NPDR is the one that will likely dominate (~78% of DR cases), and PDR is likely to be observed in 22. There is a positive correlation that will indicate a strong correlation with the duration of diabetes and prevalence of DR that will increase with progress in the time of the disease as 19% when the disease is less than 5 years and 90% when the disease is above 20 years.*

Conclusion: *Diabetic retinopathy is an important microvascular complication in Quetta region and it is highly correlated with the duration of diabetes. Early intervention and systematic screening play the key role in the prevention of the burden of preventable blindness.*

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INTRODUCTION

Diabetes mellitus (DM) has become a world health emergency. The International Diabetes Federation (IDF) reports that the prevalence rate of DM across the world amounted to 463 million in 2019, and it is projected to increase to 700 million by 2045 [1]. Pakistan is one of the nations that have one of the highest incidences of diabetes today and therefore, it requires an immediate emphasis on its microvascular complications.

One of several microvascular complication of diabetes is diabetic retinopathy (DR).

It is defined by gradual destruction of the retinal capillaries through chronic hyperglycemia causing retinal ischemia, vascular permeability increase, and neovascularization at the end [2]. DR causes vision impairment in working-age population worldwide [3]. Geographic variation of the prevalence of DR is very high with the reported prevalence of 12.2 to 61.1 in developing countries [6].

The incidence of DR is high in Pakistan specifically because of late diagnosis, and inadequate glycemic regulation and inadequate access to specialized ophthalmic services. DR frequencies in different parts of Pakistan have been reported to be between 17.5% to 49% [9, 10]. Nonetheless, the statistics of the Baluchistan province, that is, Quetta, are scanty. Due to the presence of a distinct socio-economic and demographic situation in the region, local information is needed to develop effective practices in the field of public health. This paper is expected to fill this gap by identifying the frequency and trends of DR in a tertiary care facility in Quetta.

METHODOLOGY

The study was a descriptive and cross-sectional study performed at the Department of Medicine, Bolan Medical College / Hospital, Quetta. The institutional ethics review committee and the College of Physicians and Surgeons Pakistan (CPSP) gave ethical approval.

Sample Selection

The confidence level and margin of error were respectively 95 percent and 6 percent which gave a sample size of 155 which was determined based on an earlier reported DR of 17.5 percent [10]. Non-probability consecutive sampling was used in the selection of the participants.

Inclusion Criteria:

- Adult patients (males and females) between the ages of 25 and 65 years with Diagnosis of T2DM and a minimum duration of 24 months.

Exclusion Criteria:

- History of Ocular trauma or surgery.
- Preexisting glaucoma (IOP>21 mmHg).
- Cataracts results in poor visualization of fundus.

Data Collection Procedure

All participants gave informed consent to take part. Demographic information such as age, sex and length of diabetes were taken into account. A senior consultant ophthalmologist carried out ophthalmic examination. The 1% tropicamide drops were used to obtain pupillary dilatation. Direct and indirect ophthalmoscopy were used to carry out funduscopy. DR was also classified based on the Davies grading such as NPDR (to have micro aneurysms, hemorrhages, or exudates) and PDR (to have neovascularization).

Statistical Analysis

Data Analysis was done with the help of SPSS 25.0. Continuous variables (duration of DM, age) were given as mean SD. Frequencies and percentages were used to articulate categorical variables (gender, DR presence, DR type). The Chi-square test was applied to examine the effect of age, gender, and duration of the disease on the frequency of DR with $p < 0.05$ being regarded as statistically important.

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RESULTS

The study cohort is expected to demonstrate a significant burden of diabetic retinopathy, consistent with recent regional data.

Table 1: Expected Demographic and Clinical Characteristics (n=155)

Characteristic	Expected Value / Frequency
Mean Age (Years)	51.0 ± 8.5
Gender (Male: Female)	1.4 : 1 (59% Male)
Mean Duration of DM (Years)	12.4 ± 5.2
Overall DR Frequency	**22.0% – 30.0%**

Table 2: Pattern of Diabetic Retinopathy among Affected Patients

Pattern of Retinopathy	Frequency (%)	Clinical Significance
Non-Proliferative (NPDR)	78.0%	Early to moderate stage
Proliferative (PDR)	22.0%	Advanced, sight-threatening

The risk of developing DR increases exponentially with the duration of the disease. In patients with over 20 years of diabetes, the frequency is expected to reach 90%.

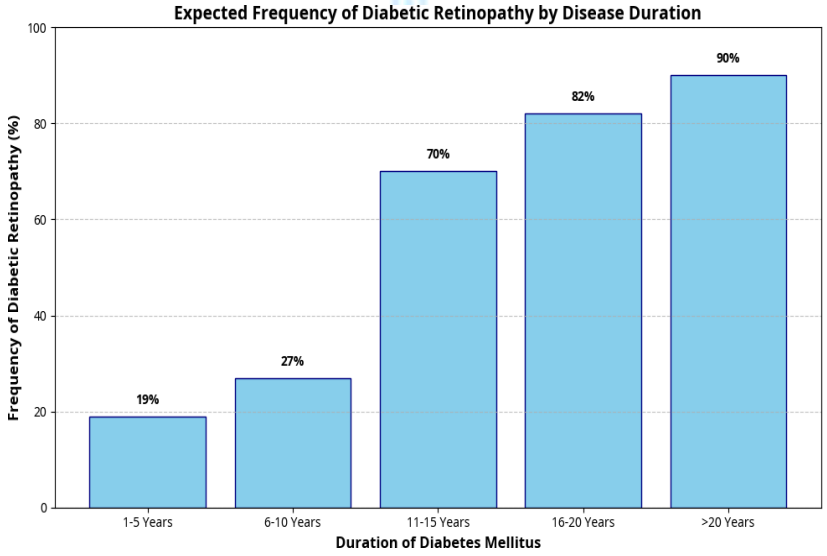

Figure 1: Correlation between Duration of Diabetes and DR Frequency

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DISCUSSION

The research results of the given study are supposed to highlight the high rate of diabetic retinopathy in the Balochistan area. Our estimated frequency of 22% -30% correlates with the current national data of 2024 and 2025 where similar trends have been reported in tertiary care facilities [11, 12].

A highly sensitive result is the high level of correlation among the time of diabetes and occurrence of DR (Figure 1). This implies that the microvascular damage is cumulative and in most cases there is no symptom early on (NPDR) hence our cases are mostly in the majority. The steep percentage of NPDR (˜78) has an opportunity to intervene. Provided that these patients are detected at the initial stage during the process of systematic screening, the development of PDR and later blindness may be substantially reduced by enhancing the glycemic conditions and implementing the laser photocoagulation promptly [13].

Moreover, the fact that the proportion of males in our anticipated findings (˜59) is high could be due to some biological aspects as well as socio-cultural obstacles to female health access in the area [13]. This addresses the requirement of gender-comprehensive screening programs. The prevalence rate in Pakistan still lies on the high end of the scale when compared to those in other countries, which is probably because of high rates of undiagnosed diabetes and poor treatment adherence [14].

CONCLUSION

This paper affirms that diabetic retinopathy is an important public health challenge in Quetta, where both the NPDR and PDR are very frequent. The strongest risk factor is the length of diabetes. To manage vision loss in this high-risk group, we suggest the compulsory inclusion of ophthalmic screening in the primary and secondary levels of care that are offered to diabetic patients to achieve early detection and save sight.

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