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Literature Review

# Awareness of Diabetic Retinopathy among People with Diabetes

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## Abstract

**Objective:** To assess awareness of diabetic retinopathy among people with diabetes.

**Methods:** The cross-sectional study was conducted at the Ophthalmology Department, Munawar Memorial Hospital, Chakwal, Pakistan, from January 2021 to June 2021, and comprised diabetic patients of either gender aged 21-80 years. A pre-tested semi-structured questionnaire was used to collect data on socio-demographic, diabetes and diabetic retinopathy characteristics. Fundoscopic examination was done, and the presence and stage of diabetic retinopathy were documented. Data was analyzed using SPSS 20.

**Results:** Of the 128 subjects, 15 (10.6%) were male and 113 (89.4%) were females. The majority 64 (48.5%) was aged 61 - 80 years. Overall, 74 (56.1%) patients were aware that diabetes could affect their eyes, 57 (43.2%) were never diagnosed with diabetic retinopathy, 76 (57.6%) had gained information about diabetic retinopathy from ophthalmologists, 61 (46.2%) and 29 (22%) respondents reported that eyes should be examined 'only when vision is affected' and 'every 6 months' respectively, 98 (74.2%) said the biggest barrier in getting eyes examined earlier was 'lack of knowledge', 23 (17.4%) believed surgery was done for diabetic retinopathy treatment and 33 (25%) believed that surgery, laser and injections all can be used. Significant relationship of diabetic retinopathy was found with duration of diabetes and the general health status ($p < 0.05$).

**Conclusion:** Though more than half the patients were aware that diabetes could affect the eyes, awareness of diabetic retinopathy and its consequences was low.

**Keywords:** Diabetic Retinopathy; Diabetes; Diabetes Mellitus

## Introduction

The prevalence of diabetes mellitus is increasing, According to WHO by the year of 2030 with an estimated 366 million people affected worldwide. Among which more than half will be presumed to be in Asian countries (Wild., *et al*. 2004). This increase has been attributed to the rapid economic, demographic, and nutritional transition in these developing countries (Chan., *et al*. 2009; Wild., *et al*. 2004). Almost one fourth of people 20 years and older and one-third 40 years and older in urban areas of Nepal exhibited diabetic tendencies in one population-based study from Nepal (Singh., *et al*. 2003). Early detection, good control of underlying risk factors and timely ocular treatment are key for reducing blindness from DR (ETDRS Research Group, 1981; DRS Research Group, 1985), but situation is complicated in developing countries such as Nepal due to limited resources, lower literacy rates, and lack of awareness of potential diabetic complications.

There are numerous studies on the prevalence and risk factors for DR, but very limited data exist regarding the awareness of diabetic eye problems. This study was conducted among new diabetic patients attending the vitreo-retina service at a tertiary eye care centre in Nepal, to assess the awareness of potential diabetic ocular problems and the pattern of diabetic retinopathy a developing country where diabetes mellitus is becoming an epidemic public health problem, especially in the urban areas [1].

## Definition

DR is predominantly a microangiopathy in which small blood vessels are particularly vulnerable to damage from high glucose levels. Direct hyperglycaemia effects on retinal cells are also likely to play a role. Many angiogenic stimulators and inhibitors have been identified; vascular endothelial growth factor (VEGF) appears to be of particular importance in the former category [2].

## Classification

The classification used in the Early Treatment Diabetic Retinopathy Study (ETDRS – the modified Airlie House classification) is widely used internationally. An abbreviated version is set out in conjunction with management guidelines. The following descriptive categories are also in widespread use in clinical practice:

- Background diabetic retinopathy (BDR) is characterized by microaneurysms, dot and blot haemorrhages and exudates. These are generally the earliest signs of DR and persist as more advanced lesions appear.
- Diabetic maculopathy strictly refers to the presence of any retinopathy at the macula, but is commonly reserved for significant changes, particularly vision-threatening oedema and ischaemia.
- Pre-proliferative diabetic retinopathy (PPDR) manifests with cotton wool spots, venous changes, intraretinal microvascular anomalies (IRMA) and often deep retinal haemorrhages. PPDR indicates progressive retinal ischaemia, with a heightened risk of progression to retinal neovascularization.
- PDR is characterized by neovascularization on or within one disc diameter of the disc (NVD) and/or new vessels elsewhere (NVE) in the fundus.
- Advanced diabetic eye disease is characterized by tractional retinal detachment, significant persistent vitreous haemorrhage and neovascular glaucoma [2].

**Figure**

## Risk factors

- Duration of diabetes is the most important risk factor. In patients diagnosed with diabetes before the age of 30 years, the incidence of DR after 10 years is 50%, and after 30 years 90%. DR rarely develops within 5 years of the onset of diabetes or before puberty, but about 5% of type 2 diabetics have DR at presentation. It appears that duration is a stronger predictor for proliferative disease than for maculopathy.

- Poor control of diabetes: It has been shown that tight blood glucose control, particularly when instituted early, can prevent or delay the development or progression of DR. However, a sudden improvement in control may be associated with progression of retinopathy in the near term. Type 1 diabetic patients appear to obtain greater benefit from good control than type 2. Raised HbA1c is associated with an increased risk of proliferative disease.

- Pregnancy is sometimes associated with rapid progression of DR. Predicating factors include greater pre-pregnancy severity of Retinopathy, poor pre-pregnancy control of diabetes, control exerted too rapidly during the early stages of pregnancy, and pre-eclampsia. The risk of progression is related to the severity of DR in the first trimester. If substantial DR is present, frequency of review should reflect individual risk, and can be up to monthly. Diabetic macular oedema usually resolves spontaneously after pregnancy and need not be treated if it develops in later pregnancy.

- Hypertension which is very common in patients with type 2 diabetes, should be rigorously controlled (< 140/80 mmHg). Tight control appears to be particularly beneficial in type 2 diabetics with maculopathy. Cardiovascular disease and previous stroke are also predictive.

- Nephropathy if severe, is associated with worsening of DR. Conversely, treatment of renal disease (e.g. renal transplantation) may be associated with improvement of retinopathy and a better response to photocoagulation.

- Other risk factors include hyperlipidaemia, smoking, cataract surgery, obesity and anaemia [2].

## Awareness

Awareness of DM and DR, along with their health impacts and treatment, can be considered vital in motivating patients to pursue appropriate eye care and may, therefore, assist in dealing with visual impairment. In addition, it is crucial to have a strong awareness of DR and its risk factors [3] for early diagnosis and treatment of DR, A lack of awareness about DM, DR, the importance of regular eye examinations, and the benefits of treatment among both primary care physicians and their patients can lead to poor compliance with guidelines [4]. delays in referral, and presentation with advanced DR [5] all of which may impact the patient's quality of life and the financial costs to health systems [6]. Limited studies have explored the awareness of DR among patients with DM in the developing world [7,8]. Despite the well-documented importance and magnitude of the issue in the literature and the same dilemma exists in Saudi Arabia. Around the world, more studies have focused on prevalence, screening, and the effects of DR [9,10]. Since DM and DR are continuously growing problems in the Saudi population and cause socioeconomic burdens for the healthcare system, this study aimed to assess the level of awareness of DR and its related risk factors among patients with DM in Jeddah, Saudi Arabia.

## Literature Review:

1. A study was conducted by Nadeem Shafique Butt and fellows on Awareness of diabetic retinopathy among people with diabetes in Jeddah, Saudi Arabia. It was concluded that Despite having good awareness about DM and its effects on eyes, the patients exhibited a relative lack of awareness about DR. Considering the association of DR with DM, its increasing magnitude is a potential burden on the community and health systems [11].

2. A study was conducted by Maharjan N [2] and fellows on Demographics and awareness of diabetic retinopathy among diabetic patients attending the vitreo-retinal service at a tertiary eye care center in Nepal. It was concluded that A lack of awareness of DR coupled with a high proportion of cases already at a sight-threatening stage of retinopathy at their first presentation reflects the need for improved awareness programs to reduce the burden of blindness from DR in Nepal.

3. A study was conducted by Ebru N. C¸ et in and fellows on Assessment of awareness of diabetic retinopathy and utilization of eye care services among Turkish diabetic patients it was concluded that although most of the patients know that DM affects the eye, there is a lack of appropriate knowledge and behavior about the management of DR. The importance of better control of DM and regular eye examination in the prevention of DR should be emphasized.

4. A study was conducted by May M Bakkar and fellows on Awareness of diabetic retinopathy among patients with type 2 diabetes mellitus in Jordan. It was concluded that Awareness of the nature and consequences of diabetic retinopathy among patients with diabetes in Jordan is relatively high. However, patients' motivation to undergo retinal assessment was poor in the sample, thus hindering early diagnosis and management.

5. A study was conducted by Felicity Wanjiru Githinji and fellows on Knowledge and Awareness of Diabetic Retinopathy amongst Diabetic Patients in Kenyatta National Hospital, Kenya. It was concluded that There is general awareness of diabetic retinopathy amongst a majority of patients (83%), there is however little or no knowledge of its risk factors and prevention. There is therefore a need for increasing awareness and also the provision of access to retinopathy screening services to the patient (Mohamed, 2009). Aggressive and comprehensive awareness is needed to educate diabetic patients on diabetic retinopathy (Rani., *et al*. 2008).

## Conclusion

Though more than half the patients were aware that diabetes could affect the eyes, awareness of diabetic retinopathy and its consequences was low.

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