

ORIGINAL ARTICLE

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PRELIMINARY LEVEL STUDIES ON DIABETIC RETINOPATHY AMONGST DIAGNOSED AND UNDIAGNOSED DIABETIC PATIENTS

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ABSTRACT

An attempt has made to investigate the disorder, diabetic retinopathy among the diabetic patients belonging to Hyderabad and its adjoining areas. In this context, the cases of diabetic retinopathy were investigated according to the questionnaire from the different hospitals of Hyderabad, Jamshoro and Tando Muhammad Khan. The investigations were made with the help of different tests like, Fundoscopy and Optical Coherence Tomography (O.C.T). It was concluded from the results achieved that majority of the diabetic retinopathy was due to heredity. Most of the patients had high blood pressure with hyperglycaemia and pain in bones, whereas, in some patients obesity with hyperglycaemia and high blood pressure was also prevailed. As far as the vision is concerned most of diabetic patients had blurry vision whereas, short and long sightedness was also found in many patients. Majority of the patients involved in this disorder having type 2 diabetic mellitus (INDDM).

Keywords: Diabetes mellitus, Diabetes retinopathy, Hyperglycemia, Insulin, Preliminary.

INTRODUCTION

Pancreas is an endocrine as well as exocrine gland. The endocrine secretions of pancreas are responsible for maintaining body's sugar levels. The most common disease resulting from impaired pancreatic hormone release is diabetes mellitus.⁽¹⁾ The 2 forms of diabetes, type 1 and type 2 are characterized by impaired insulin release. Type 1 diabetes is an

autoimmune disorder also known as insulin – dependent diabetes (juvenile- onset diabetes) is the result of impairment of beta cells in younger people. Type 2 diabetes results in irregular secretion of insulin hormone and accounts for more than 90% of diabetes cases. It usually presents in obese adults.⁽²⁻³⁾

The diabetic retinopathy is a major public concern. It is a diabetic eye disease resulting

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from chronic high blood glucose levels causing damage to the retinal capillaries. It is the most common microvascular complication of diabetes mellitus. ⁽⁵⁻⁷⁾ Diabetic retinopathy is the leading cause of vision loss in working age adults. It is one of the most common causes of blindness in adults between 30 and 65 years of age in developed countries. It causes damage to the retina. The eyes are organs of sight enabling us to encounter shape, colour and movements of objects and persons around us. ⁽⁸⁾

The inner most sensitive layer of eye is the retina. The cells in the retina namely Rods and Cones help in the formation of image on retina above the point of entry of optic nerve called blind spot. Diabetic retinopathy occurs when blood glucose level changes in retinal blood vessels. In some cases, these vessels will swell up and leak fluid into rear of the eye. ⁽⁹⁻¹¹⁾ In other cases, abnormal blood vessels will grow on the surface of retina. The progression of significant diabetic retinopathy may occur without symptoms. There are two types of diabetic retinopathy: Non-proliferative and proliferative. In non-proliferative diabetic retinopathy, the initial visible lesions are micro aneurysms that form on the terminal capillaries of retina. Increased permeability of the capillaries is manifested by the leaking of proteinaceous fluid, causing hard exudates. Dot and blot haemorrhages occur from the red blood cells. These findings by themselves do not lead to visual loss and are categorized as non proliferative retinopathy. Proliferative retinopathy by contrast, develops when the retinal vessels are further damaged, causing retinal ischemia. The ischemia triggers new fragile vessels to develop a process termed neovascularisation. These vessels may grow into the vitreous cavity and may bleed into the pre retinal area or vitreous, causing significant vision loss. Loss of vision also may result from

retinal detachment which often accompanies neovascularisation. ⁽¹²⁻¹⁵⁾

The purpose of present study is to collect the information about retinopathy in diabetic patients belonging to Hyderabad city and its adjoining area. The emphasis of present study will also be on all the patients who are suffering from this disorder regardless of type hyperglycaemia or hyperglycaemia subjects. The present study shall hopefully give us an understanding about this disorder and the information sought will be used in the society for getting preventive measures to get rid of the problem.

PATIENT AND METHODS

An attempt was made to collect the information about the diabetic retinopathy in the patients attending the hospitals of Hyderabad, Jamshoro and Tando Muhammad Khan. In this context 40 patients of diabetic retinopathy were interviewed according to a questionnaire prepared to collect the information about the diabetic disorder. In order to collect the information about eye different tests like, Fundoscopy and optical coherence tomography (O.C.T) was conducted by this we had the actual condition of the eye that is affected by the diabetic pathology. All the information with regard to the retinopathy was aggregated in the table form and then interpreted accordingly.

RESULTS

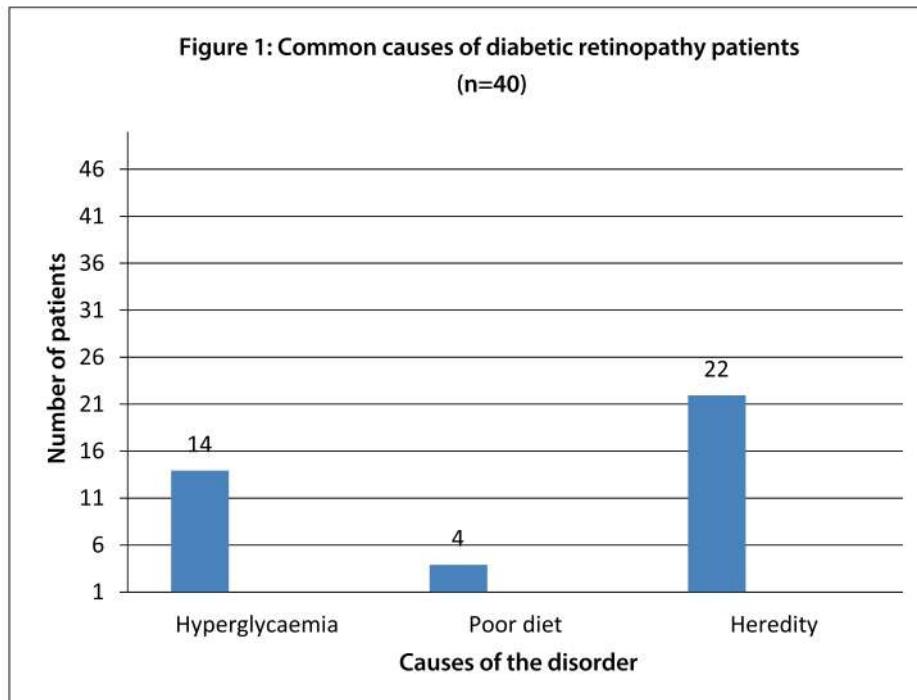


Figure 1 explains that as per data / information collected from different hospitals with respect to the diabetic retinopathy , the result indicates that from 40 patients examined 14 patients involved in diabetic retinopathy were hyperglycaemic whereas, in only 04 from all the patients examined, the disorder was developed due to poor diet. In rest of 22 patients as per their version and other diagnostic causes of the disorder retinopathy was heredity.

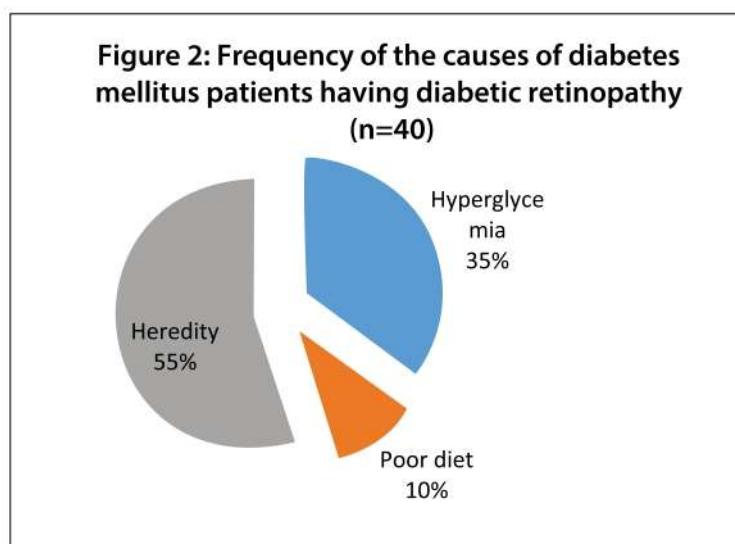


Figure 2 shows that the causes of diabetic retinopathy in percentage (%) are: 55% Heredity, 35% Hyperglycaemia and 10 % poor diet.

Table 1 showing duration of the disorder of the disorder of the patients investigated (n=40)

Number of Patients	Duration of Disease
2	5 Years
4	6 Years
2	9 Years
8	10 Years
2	11 Years
6	12 Years
2	13 Years
2	14 Years
6	15 Years
2	18 Years
2	20 Years
2	30 Years

Table 1 explains, as far as the age is concerned, the diabetic retinopathy was developed in the individual during different ages. From all the 40 patients, 8 patients having diabetes since 10 years, 06 patients having diabetes since 12 years, whereas 06 patients suffering from the same disorder since 15 years. However, rest of the patients examined were found involved with diabetes for 1-2 years.

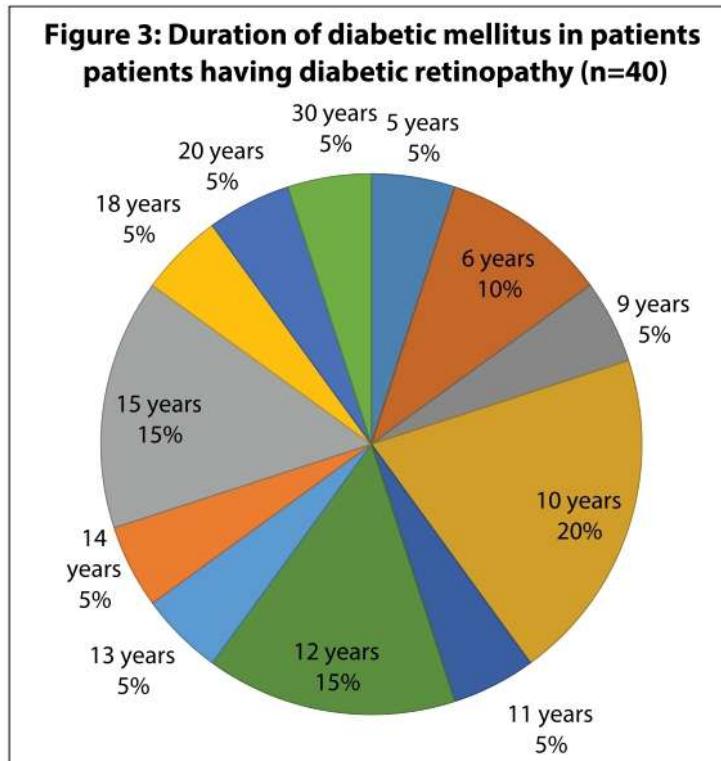


Figure 3 shows the % ratio of the duration which is minimum 5 years of duration 5% and the maximum 10 year duration 20%

Table 2: Clinical features in patients of diabetic retinopathy (n=40)

Number of Patients	Symptoms
12	Obesity, hyperglycaemia, high blood pressure.
4	Obesity, high blood pressure, swelling in hands and feet.
16	High blood pressure, hyperglycaemia, pain in bones.
4	Obesity, pain in joints, anaemic
4	Obesity, high blood pressure, nephropathy

Table 2 reveals that 16 patients out of 40 patients have suffering from high blood pressure, hyperglycaemia, and pain in bones; whereas, 12 patients were suffering from obesity, hyperglycaemia, and high blood pressure. Remaining 12 patients of DR patients had pain in joints, high blood pressure and nephropathy whereas obesity is common in all 06 patients. It was therefore concluded from this data about the prevalence of disorders in retinopathic subject that most common factor in diabetic retinopathy is the hyperglycaemia whereas; the obesity is also the cause of the diabetic retinopathy but at the secondary level.

Table 3: Patients of diabetic retinopathy having common visual problems (n=40)

Number of Patients	Visual problems
6	Blurry vision, long sightedness, short sightedness.
14	Blurry vision
12	Short sightedness, long sightedness
4	Blurry vision, dark spots
4	Vision loss

Table 3 reveals that 14 patients out of 40 patients of diabetic retinopathy had blurry vision, while 12 patients had long sightedness/ short sightedness. The 06 patients were suffering from blurry vision, long sightedness/ short sightedness; whereas, the other 04 patients had blurry vision with dark spots on retina of eyes. Remaining patients of diabetic retinopathy which are 04 in number had completely loss their vision. As per data is concluded the results of the vision difficulty in the shape of blurry vision were common problem whereas, the dark spots and complete vision loss was on low level.

Figure 4: Frequency of the type of diabetes mellitus patients having diabetic retinopathy (n=40)

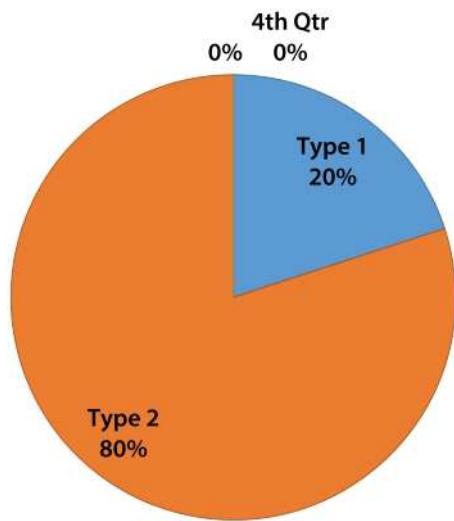


Figure 4 shows that 80% of patients of diabetic retinopathy have Type 2 NIDDM and only 20% of patients have Type 1 IDDM.

DISCUSSION

Our study has shown the different causes of diabetic retinopathy which includes hyperglycaemia, heredity and poor diet. It also includes the duration of the diabetes mellitus in the patients of the diabetic retinopathy which ranges from 5 years to 30 years. It includes the common disorders seen in the patients of the diabetic retinopathy which includes long sightedness, short sightedness, blurry vision and the vision loss. Our study has shown certain figures and results which are uncommon from other studies.

The incidence of diabetic retinopathy was estimated to be 15.7 % in one study.⁽⁹⁾ The prevalence of diabetic retinopathy is as high as 55.3 % in a hospital-based study conducted in Karachi.⁽¹⁴⁾ The explanation for this severe incidence variance is that many cases remain underdiagnosed. The prevalence of diabetic retinopathy was found to be 6.5 % of the studied population in a similar study conducted

in China, whereas a higher frequency (32%) was seen in Indian patients.⁽¹⁵⁻¹⁶⁾ As with the incidence in western countries, with 4.4 % of visually threatening illness, the US population reported 28.5 % of patients positive for diabetic retinopathy.⁽¹⁷⁾ In a related study conducted in Spain, which showed a prevalence of 12.3 %, markedly distinct results were seen.⁽¹⁸⁾ In the future, broader spectrum studies are required to determine the frequency of diseases threatening this disastrous vision, and this must be done nationally. There is an immaculate need for extreme steps to spread awareness of this complication on a wider scale to patients suffering from diabetes, so that more people can be diagnosed earlier and can be tracked during the course of the disease.

Our research has a range of limitations. The data obtained in our research came from limited areas, which contributes to bias may effect sampling, since our study does not target all people in a group. In our research the

primary basis for the early or late development of the disease was not considered to be the disposition of jobs or educational status.

CONCLUSION

To sum up the present prevalence of diabetic retinopathy, a severe progressive vision threatening condition is described in this study. However through early diagnosis and timely treatment, this complication of diabetes can be prevented.

References

1. Sohail M. Prevalence of diabetic retinopathy among type 2 diabetes patients in Pakistan – vision registry. *Pak J Ophthalmol.* 2014; 30(4):204-12.
2. Global report on diabetes. France: The World Health Organization; 2016:88.
3. IDF Diabetes Atlas. Eighth edition; 2017.
4. Jawa A, Assir MZK, Riaz SH, Chaudhary R, Awan F, Akram J. A simple integrated primary health care based model for detection of diabetic retinopathy in resource-limited settings in Pakistani population. *Pak J Med Sci.* 2016; 32(5):1102-06.
5. Prevention of blindness and visual impairment. World Health Organization. Available from: <http://www.who.int/blindness/causes/en/>.
6. Jiskani SA, Singh D, Meghji KA, Talpur RA, Khan J, Khanzada HN. Microalbuminuria and Its Association with Glycemic Control in Patients with Diabetes Mellitus Type II. *Professional Med J.* 2020;27(8):1617-1620.
7. Diabetic Retinopathy - Asia Pacific Nov 2013. Available from: <https://www.aoa.org/topic-detail/diabeticretinopathy-asia-pacific>
8. Pakistan Demographics Profile 2018. Available from: https://www.indexmundi.com/pakistan/demographics_profile.html.
9. Jiskani SA, Khawaja SI, Talpur RA. Disturbances in Serum Electrolytes in Type 2 Diabetes Mellitus. *National Journal of Health Sciences.* 2018;3(4):128-131.
10. Kovarik JJ, Eller AW, Willard LA, Ding J, Johnston JM, Waxman EL. Prevalence of undiagnosed diabetic retinopathy among inpatients with diabetes: The diabetic retinopathy inpatient study (DRIPS). *BMJ Open Diabetes Research & Care.* 2016; 4(1):e000164. doi:10.1136/bmjdrc-2015-000164.
11. Crawford TN, Alfaro DV, Kerrison JB & Jablon EP. Diabetic retinopathy and angiogenesis. *Curr Diabetes Rev.* 2009; 5:8-13.
12. Early treatment diabetic retinopathy study research group. Early photo-coagulation for diabetic retinopathy. ETDRS report number 9. *Ophthalmol.* 1991 May; 98:766-85.
13. Esteves J, Laranjeira AF, Roggia MF, Dalpizol M, Scocco C, Kramer CK, et al. Diabetic retinopathy risk factors. *Arq Bras Endocrinol Metabol.* 2008; 52:431-41.
14. Alkhairy S, Rasheed A, Aziz F, Nawaz S. Frequency of diabetic retinopathy in Karachi, Pakistan: A hospital based study. *Journal of Dow Uni Health Sci.* 2015 Sep 1; 9(2).
15. Xie X, Xu L, Yang H et al. Frequency of diabetic retinopathy in the adult

population in China: The Beijing Eye Study 2001. *Int Ophthalmol.* 2009; 29:485–93.

16. Bansal P, Gupta RP, Kotecha M. Frequency of diabetic retinopathy in patients with diabetes mellitus and its correlation with duration of diabetes mellitus. *Med J Dr D.Y. Patil Vidyapeeth.* 2013; 6(4):366-9.

17. Zhang X, Saaddine JB, Chiu CF, Cotch MF, Cheng YJ, Geiss LS, et al. Prevalence of diabetic retinopathy in the United States, 2005-2008. *JAMA (Reprinted).* 2010; 304(6):649-56.

18. Poncelas AR, Jimenez SM, Casellas A, La Puente JFB, Nadal JF, Simarro FL, et al. Prevalence of diabetic retinopathy in individuals with type 2 diabetes who had recorded diabetic retinopathy from retinal photographs in Catalonia (Spain). *Br J Ophthalmol.* 2015; 99(12):1628-33.