Assessment of Diabetic Retinopathy among the Diabetes Mellitus Type –II Patients at Tertiary Care Hospital of Hyderabad

Asadullah Jatoi a*, Noman Ahmed Shaikh a and Mona Liza Mahesar a

a Institute of Ophthalmology, Liaquat University of Medical & Health Sciences, Jamshoro, Sindh, Pakistan.

Authors’ contributions
This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Article Information
DOI: 10.9734/JPRI/2022/v34i4A35396

Open Peer Review History:
This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: https://www.sdiarticle5.com/review-history/80247

Received 20 November 2021
Accepted 24 January 2022
Published 25 January 2022

Original Research Article

ABSTRACT

Background: Diabetes Mellitus is the major and leading cause of mortality among the local population of Asian countries. Routinely increase in the number of diabetes mellitus can produce financial and health crises.

Aim and Objective: This study aims to evaluate the diabetic retinopathy among the diabetes mellitus type-II at tertiary care hospital of Hyderabad.

Materials and Methods: The current research was conducted for the period of 06 months at Department of Medicine, tertiary care hospital of Hyderabad. Total 158 patients were selected with confirmed report of diabetic retinopathy. Demographic data was taken from all participants. Eye examination was performed by ophthalmologist and results were analyzed.

Results: After proper collection of data, results were compiled accordingly, total 158 participants were included in the study, from them 92 were males, 66 females. 49 patients were fall in the category of 33-39years of age group, 87 patients were having less than 1 year diabetic history, 66 participants had moderate level of HbA1c, 79 people only use Oral medicine for diabetic control, 109 patients had hypertension, 01 patients was reported with heart failure, whereas 81 patients had reported NPDR (Non-Proliferative Diabetic Retinopathy) and 77 had PDR (Proliferative Diabetic Retinopathy).

*Corresponding author: E-mail: drasadullahjatoi@gmail.com;
Conclusion: It was concluded from the current study that diabetic retinopathy was associated with long term complication of diabetes and considered as indication for severe type of diseases associated with diabetes. Patients of NPDR with very low care can develop PDR. So the patients of NPDR were closely monitored through Ophthalmologist and Diabetologist.

Keywords: HbA1c; retinopathy; diabetes; ophthalmologist; PDR.

1. INTRODUCTION

Diabetes Mellitus is the major and leading cause of mortality among the local population of Asian countries [1]. Routinely increase in the number of diabetes mellitus can produce financial and health crises [2,3]. Diabetes is actually a metabolic syndrome associated with polyurea, polyphagia and polydipsia, due to dysfunction of beta cells of pancreas. Diabetes mellitus can be managed through different oral hypoglycemic agents, diet control, exercise and insulin therapy [4]. If it is not managed properly on time, it can produce severe type of complication such as neuropathy, retinopathy, nephropathy and heart related problems [5]. Diabetic retinopathy can cause by the over accumulation of glucose molecules in the retina and causes impaired vision and sometime blindness [6]. In United States of America, Diabetic retinopathy is the leading cause of blindness among the adults with different age. Diabetic retinopathy is more common among the DMT1 patients as compared to DMT2 patients [7]. According to latest survey, the newly diagnose case of retinopathy are more among type-ii patients. The Wisconsin epidemiologic study of retinopathy and DCCT (Diabetes Control & Complication Trials) elaborates that if the level of sugar is under given control limits, the chances of complication may also decreased [8, 9]. According to various association working on diabetes and its management, gave the similar type of consequences. There is no any authenticate literature available which proof that control glycemic level cannot produce any type of micro and macro complications in either type of diabetes [10]. The major reason for such type of condition is the adaptation of various intensive therapies such as restriction on dietary products, severe type of exercise and self medication of herbal therapies. Generally, Diabetic retinopathy is divided in to two major classis including NPDR (Non-Proliferative Diabetic Retinopathy) and PDR (Proliferative Diabetic Retinopathy) and these can be further divided into number of classes, depending on clinical and pathological condition of eye [11,12]. Non-Proliferative Retinopathy is characterized by abnormalities in retinal blood vessel and hemorrhages that leads to Ischemia & hypo-perfusion of retina. In this type of retinopathy, patients did not report any type of symptoms or complain. They only have impaired vision or color blindness [13]. If the ischemic damage occur within retina due to angio-genic factors that leads to Neo-vascularization of the retinal surface. Neo-vascularization ruptures the blood vessel which leads to bleeding within retinal surface and in vitreous body [14]. This bleeding induces retinal detachment and irreversible visual impairment occurs. Micro complication of diabetes can be managed properly, if these are diagnosed properly on time. So, the proper diagnosis is the major tool to get rid of such type of complication or loss of vision in retinopathy.

2. METHODOLOGY

The current research was conducted for the period of 06 months at Department of Medicine, tertiary care hospital of Hyderabad. Total 158 patients were selected with confirmed report of diabetic retinopathy. Demographic data including gender, socio-economic values, diabetes history, treatment options, history of obesity and hypertension, smoking history and chronic diseases, glycemic control level according to HbA1c level was taken from all participants. Eye examination was performed by ophthalmologist at Department of Ophthalmology that includes eye fundus examination by ophthalmoscopy with slit-lamp and medriasis of eyes were taken by using oral drops prior to inspection. Data was analyzed by using statistical software SPSS. 24.00 version.

3. RESULTS

After proper collection of data, results were compiled accordingly. All demographic data was assembled in various tabular forms as given as under.

4. DISCUSSION

A study was carried out on the incidence of diabetic retinopathy in a selective community
was almost 19%. These findings are compatible with other studies. In United Kingdom 22% diabetic people develop retinopathy. Another study was carried out for the period of 9 years that develop the retinopathy up to 30%. DME detected 42% of eyes with proliferated diabetic retinopathy [6, 7]. Current study was related to reduce the risk level of diabetes with specified control level of glycemic level in the blood. For the better control of diabetic complication, Insulin therapy was given to the patients with Non-proliferative diabetic retinopathy. Disease ratio was quite less among the patients with poor control of glycemic level [9,10]. Various factors were also associated for the development of non-proliferative diabetic retinopathy that includes age, gender and socio-economic values. These fluctuating factors were diagnosed by the ophthalmologist. Many medicines were too much expensive and patients develop adherence by dropping the doses [12,13]. Current studies also support the complications of diabetes that were developed through improper control. If the protein excretes from the kidneys, so might cause kidney failure. Framingham study showed that there was no any authenticate relation in the ischemic heart failure and diabetic complication. Higher rate of heart disease was observed among the patients with very low glycemic control [15] Retinopathy was also considered as indication of severe complication. Screening for retinopathy helps physician to diagnose the diabetic condition and patients without any authenticate sign and symptoms of retinopathy might control their diabetes for longer period of time and control their glycemic level in order to reduced complications.

Table 1. Gender wise distribution of participants

| Gender | Number | Frequency |
|--------|--------|-----------|
| Male   | 92     | 58.22%    |
| Female | 66     | 41.77%    |

Table 2. Age wise distribution of study subjects

| Age group | Number | Frequency |
|-----------|--------|-----------|
| 18-25     | 12     | 7.59%     |
| 26-32     | 35     | 22.15%    |
| 33-39     | 49     | 31.01%    |
| 40-46     | 34     | 21.51%    |
| 47-53     | 21     | 13.29%    |
| 54-60     | 07     | 4.43%     |

Table 3. Types of diabetes among study subjects

| Diabetes | Number | Frequency |
|----------|--------|-----------|
| Type-I   | 43     | 27.21%    |
| Type-II  | 118    | 74.68%    |

Table 4. Socio economic values of study subjects

| Socio-Economic value | Number | Frequency |
|----------------------|--------|-----------|
| Low                  | 71     | 44.93%    |
| Moderate             | 64     | 40.5%     |
| High                 | 23     | 14.55%    |

Table 5. History of diabetes among study subjects

| Diabetic history     | Number | Frequency |
|----------------------|--------|-----------|
| 1 year or less       | 87     | 55.06%    |
| 5 year or less       | 42     | 26.58%    |
| 10 years or less     | 29     | 19.35%    |
Table 6. HbA1c level of participants

| HbA1c  | Number | Frequency  |
|--------|--------|-----------|
| Low    | 19     | 12.02%    |
| Moderate | 66    | 41.77%    |
| High   | 73     | 46.20%    |

Table 7. Treatment options adopted by participants

| Treatment options | Number | Frequency |
|-------------------|--------|-----------|
| Diet Control      | 15     | 9.49%     |
| Exercise          | 24     | 15.18%    |
| Oral Medicine     | 79     | 50%       |
| Insulin           | 40     | 25.31%    |

Table 8. Co-morbidities observed among participants

| Co-morbidities         | Number | Frequency |
|------------------------|--------|-----------|
| Hypertension           | 109    | 68.98%    |
| Ischemic Heart Disease | 17     | 10.75%    |
| Vascular Disease       | 28     | 17.72%    |
| Heart Failure          | 01     | 0.63%     |
| Renal Failure          | 03     | 1.89%     |

Table 9. Body mass index of study subjects

| BMI   | Number | Frequency |
|-------|--------|-----------|
| Low   | 22     | 13.92%    |
| Moderate | 97   | 61.39%    |
| Severe| 39     | 24.68%    |

Table 10. Diabetic retinopathy condition among study subjects

| Diabetic Retinopathy | Number | Frequency |
|----------------------|--------|-----------|
| NPDR                 | 81     | 51.26%    |
| PDR                  | 77     | 48.73%    |

5. CONCLUSION

It was concluded from the current study that diabetic retinopathy was associated with long term complication of diabetes and considered as indication for severe type of diseases associated with diabetes. Patients of NPDR with very low care can develop PDR. So the patients of NPDR were closely monitored through Ophthalmologist and Diabetologist.

CONSENT

As per international standard or university standard, respondents’ written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Porta M, Bandello F. Diabetic retinopathy. Diabetologia. 2002;45(12):1617-1634.
2. Kempen JH, O’Colmain BJ, Leske MC, Haffner SM, Klein R, Moss SE, Taylor HR, Hamman, RF. The prevalence of diabetic retinopathy among adults in the United States. Archives of ophthalmology (Chicago, Ill.: 1960), 2004;122(4):552-563.
3. Engerman RL. Pathogenesis of diabetic retinopathy. Diabetes. 1989;38(10):1203-1206.
4. Tang J, Kern TS. Inflammation in diabetic retinopathy. Progress in Retinal and Eye Research. 2011;30(5):343-358.
5. Mohamed Q, Gillies MC, Wong TY. Management of diabetic retinopathy: A systematic review. JAMA. 2007;298(8):902-916.
6. Zhang X, Saaddine JB, Chou CF, Cotch MF, Cheng YJ, Geiss LS, Gregg EW, Albright AL, Klein BE, Klein R. Prevalence of diabetic retinopathy in the United States, 2005-2008. JAMA. 2010;304(6):649-656.
7. Ferris FL. How effective are treatments for diabetic retinopathy?. JAMA. 1993;269(10):1290-1291.
8. Fong DS, Aiello L, Gardner TW, King GL, Blankenship G, Cavallerano JD, Ferris FL, Klein R. Retinopathy in diabetes. Diabetes Care. 2004;27(suppl 1):s84-s87.
9. Stitt AW, Curtis TM, Chen M, Medina RJ, McKay GJ, Jenkins A, Gardiner TA, Lyons TJ, Hammes HP, Simo R, Lois N. The progress in understanding and treatment of diabetic retinopathy. Progress in Retinal and Eye Research. 2016;51:156-186.
10. Wilkinson CP, Ferris III FL, Klein RE, Lee PP, Agardh CD, Davis M, Dills D, Kampik A, Pararajasegaram R, Verdaguer JT, Group GDRP. Proposed international clinical diabetic retinopathy and diabetic macular edema disease severity scales. Ophthalmology. 2003;110(9):1677-1682.
11. Yau JW, Rogers SL, Kawasaki R, Lamoureux EL, Kowalski JW, Bek T, Chen SJ, Dekker JM, Fletcher A, Graulund J, Haffner S. Global prevalence and major risk factors of diabetic retinopathy. Diabetes Care. 2012;35(3):556-564.
12. Gardner TW, Antonetti DA, Barber AJ, LaNoe KF, Levison SW. Penn State Retina Research Group. Diabetic retinopathy: more than meets the eye. Survey of Ophthalmology. 2002;47(Suppl 1):S84-S87.
13. Ferris FL, Davis MD, Aiello LM. Treatment of diabetic retinopathy. New England Journal of Medicine. 1999;341(9):667-678.
14. Kowluru RA, Chan PS. Oxidative stress and diabetic retinopathy. Experimental Diabetes Research; 2007.
15. Kauppi T, Kalesnykiene V, Kamarainen JK, Lensu L, Sorri I, Raninen A, Voutilainen R, Uusitalo, H, Kälviäinen H, Pietilä J. The diaretdb1 diabetic retinopathy database and evaluation protocol. In BMVC. 2007;1:1-10.