

Study of Analysis of Risk Factors of Diabetic Retinopathy at a Tertiary Care Hospital

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ABSTRACT

Background: Diabetes mellitus (DM) has been known as a potentially disabling chronic disease with multiple complications. This study was conducted for analysis of risk factors of diabetic retinopathy.

Materials and Methods: This study was conducted for analysis of risk factors of diabetic retinopathy. There were 100 participants in this study who had diabetes. The mean age of the subjects was 34.7 years. The subjects had been explained about the procedure and were asked for written consent. The subjects who provided the consent had been included in the study. The risk factors for diabetic retinopathy were evaluated. Statistical analysis was conducted using SPSS software.

Results: The mean age of diabetic subjects was 34.7 ± 8.2 years. The duration of diabetes was 12.5 ± 6.3 years. The mean HbA1c was 9.87 ± 1.3 . The mean BMI was 32.14 ± 5.6 . Out of 100 subjects, 41 were male and 59 were female. The most common risk factor was prolonged duration of diabetes (>10 years) seen in 25 subjects. Poorly controlled HbA1c was another common risk factor seen in 23 subjects. Hypertension was also among common risk factors evident in 24 cases. Nephropathy and neuropathy were seen in 19 and 21 subjects, respectively. Obesity and anaemia were seen in 15 and 9

subjects, respectively. Smoking and hyperlipidemia were the risk factors for 5 and 4 subjects, respectively.

Conclusion: The risk factors of diabetic retinopathy were prolonged duration of diabetes, poorly controlled HbA1c, hypertension, nephropathy, neuropathy, obesity, anaemia, smoking and hyperlipidemia.

Keywords: Diabetes mellitus, Diabetic retinopathy, Neuropathy.

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INTRODUCTION

Diabetes mellitus (DM) has been known as a potentially disabling chronic disease with multiple complications.¹ In the Kingdom of Saudi Arabia (KSA), diabetes has emerged as a major public health problem that has reached an epidemic stage.² The crude prevalence of diabetes has been documented as 23.7%, accounting for 37.8% of Saudis aged between 30 and 70 years.³ With the advances in the healthcare facilities in the Kingdom, the life expectancy of diabetic patients has increased. Therefore, the complications associated with longer duration of the disease have become one of the challenges faced by health care institutions. Of these complications, a retinal vascular disorder, retinopathy is considered the leading cause of blindness in the working age population⁴ and accounts for considerable adult work disability.⁵ Its presence may also indicate and predict other diabetic complications.⁶ The risk factors of DR are many and complex. It

can make the patient progress from asymptomatic step by step and eventually lead to irreversible blindness. However, it is still difficult to effectively prevent the visual impairment caused by it.⁷ Hence; this study was conducted for analysis of risk factors of diabetic retinopathy.

MATERIALS AND METHODS

This study was conducted for analysis of risk factors of diabetic retinopathy. There were 100 participants in this study who had diabetes. The mean age of the subjects was 34.7 years. The subjects had been explained about the procedure and were asked for written consent. The subjects who provided the consent had been included in the study. The risk factors for diabetic retinopathy were evaluated. Statistical analysis was conducted using SPSS software.

RESULTS

The mean age of diabetic subjects was 34.7 ± 8.2 years. The duration of diabetes was 12.5 ± 6.3 years. The mean HbA1c was 9.87 ± 1.3 . The mean BMI was 32.14 ± 5.6 . Out of 100 subjects, 41 were male and 59 were female. The most common risk factor was prolonged duration of diabetes (>10 years) seen in 25 subjects.

Poorly controlled HbA1c was another common risk factor seen in 23 subjects. Hypertension was also among common risk factors evident in 24 cases. Nephropathy and neuropathy were seen in 19 and 21 subjects, respectively. Obesity and anaemia were seen in 15 and 9 subjects, respectively. Smoking and hyperlipidemia were the risk factors for 5 and 4 subjects, respectively.

Table 1: Baseline characteristics of subjects with diabetes.

Variables	Mean $\pm$ SD
Age (years)	34.7 ± 8.2
Duration of diabetes (years)	12.5 ± 6.3
HbA1c	9.87 ± 1.3
Body Mass Index	32.14 ± 5.6

Table 2: Gender-wise distribution of subjects.

Gender	Number of subjects	Percentage
Male	41	41
Female	59	59
Total	100	100

Table 3: Risk factors for diabetic retinopathy

Variable	Number of cases
Prolonged duration of diabetes (>10 years)	25
Poorly controlled HbA1c (>9)	23
Hypertension	24
Neuropathy present	21
Nephropathy present	19
Obesity	15
Anaemia	09
Smoking	05
Hyperlipidemia	04

DISCUSSION

Diabetes mellitus (DM) is a group of chronic metabolic diseases caused by genetic, environmental, and autoimmune diseases. Long-term metabolic disorders can lead to microvascular and macrovascular diseases, neurological complications, among others.⁸ With the substantial improvement of people's living standards, changes in eating habits and lifestyles, the number of people suffering from diabetes mellitus (DM) is also increasing year by year. According to the WHO study, in 2011, the number of diabetic patients worldwide has reached 366 million, and by 2025, there will be >500 million diabetic patients in the world, and about one-third of them will develop diabetic retinopathy (DR).⁹ Hence; this study was conducted for analysis of risk factors of diabetic retinopathy.

In this study, the mean age of diabetic subjects was 34.7 ± 8.2 years. The duration of diabetes was 12.5 ± 6.3 years. The mean HbA1c was 9.87 ± 1.3 . The mean BMI was 32.14 ± 5.6 . Out of 100 subjects, 41 were male and 59 were female. The most common risk factor was prolonged duration of diabetes (>10 years) seen in

25 subjects. Poorly controlled HbA1c was another common risk factor seen in 23 subjects. Hypertension was also among common risk factors evident in 24 cases. Nephropathy and neuropathy were seen in 19 and 21 subjects, respectively. Obesity and anaemia were seen in 15 and 9 subjects, respectively. Smoking and hyperlipidemia were the risk factors for 5 and 4 subjects, respectively. Khan AR et al¹⁰ evaluated the prevalence of diabetic retinopathy (DR) in the urban and rural areas of Al Hasa region of Saudi Arabia and to determine risk factors related to DR. The prevalence of DR among 473 diabetic subjects was 30% (95% CI: 25.80-34.20). The odd ratios (ORs) of DR among diabetic residing in an urban area was significantly higher than diabetics residing in rural areas [OR = 1.94 (95% CI of OR 0.82-2.89)]. DR was associated to the duration of diabetes (adjusted OR = 1.70), uncontrolled blood sugar level (adjusted OR = 1.96), hyperlipidemia (adjusted OR = 2.04), and hypercholesterolemia (adjusted OR = 2.80). DR appears to be a public health problem in the Al Hasa district of Saudi Arabia, and a planned approach is required to avoid severe visual impairment in patients with

diabetes mellitus. Primary prevention and early detection could be implemented through primary health centers and non-ophthalmologists. Ahmed RA et al¹¹ assessed the proportion and grades of retinopathy and its risk factors in diabetes type 2 patients. 401 type 2 diabetic patients were assessed. A questionnaire and checklist were used to collect the data. Retinopathy was diagnosed and graded by fundus photographs and slit lamp examination. The duration of diabetes, age of patients, age at onset of diabetes, body mass index, hemoglobin A1c level, blood pressure, and complications were noted. The mean age of male and female patients was 54.93 and 54.25 years; 57.6% were males. The mean age of onset and mean duration of diabetes were 43.91 and 13.4 years, respectively. The proportion of retinopathy was 36.4%. Grades of retinopathy were: Mild 57.5%, moderate 19.9%, severe nonproliferative 11%, and proliferative retinopathy 11.6%; 7.2% of patients had maculopathy. Retinopathy was significantly associated with older age, younger age at onset, longer duration of disease, poorly controlled blood sugar, hypertension, insulin use; the presence of neuropathy and nephropathy appeared as a significant risk. Younger age at onset, longer duration, and insulin use appeared as the strongest predictors for diabetic retinopathy. More than a third (36.4%) of the diabetic patients attending a diabetic center had retinopathy. The control of the risk factors may reduce both prevalence and consequences of retinopathy.

CONCLUSION

The factors contributing to the risk of diabetic retinopathy include an extended duration of diabetes, inadequate management of HbA1c levels etc.

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