Assessment of Visual Acuity among Diabetic Patients

Ajay Jurangal¹, Ankur Singh¹, Ramandeep Kaur Dhaliwal²

INTRODUCTION

Diabetes is as yet a noteworthy reason for visual hindrance and visual deficiency in individuals of working age. As the pervasiveness of diabetes is rising, visual impairment among these patients speaks to a developing worldwide medical issue. The present study was planned to assess the visual acuity among diabetic patients.

MATERIAL AND METHODS

The present study was conducted in the department of Anesthesia, Government Medical College, Amritsar. The study was conducted on eyes of 50 patients, 25 diabetic and 25 non diabetic visiting the outpatient department. The refractive status of the patients was measured by automated refractometer, and then refraction was done subjectively by means of Snellen’s test type charts. The Visual acuity scores for all the patients were recorded and were subject for analysis.

RESULTS

In diabetic patients group, 15 patients were male and 10 patients were females. In Non-diabetic patients group 13 were males and 12 were females. Maximum numbers of diabetic patients, both male (n=10) and female (n=8) are in group 51-60 years age group. The maximum no. of diabetic eyes (30%) had best corrected visual acuity 6/18. In contrast to this, maximum no. of non-diabetic eyes (38%) had best corrected visual acuity 6/9.

CONCLUSION

Based on the findings of present study, we conclude that non-diabetic eyes are found to be having better best corrected visual acuity than diabetic.

Keywords: Diabetes Mellitus, Snellen’s Chart, Visual Acuity

ABSTRACT

Introduction: Diabetes is as yet a noteworthy reason for visual hindrance and visual deficiency in individuals of working age. As the pervasiveness of diabetes is rising, visual impairment among these patients speaks to a developing worldwide medical issue. The present study was conducted in the department of Anesthesia, Government Medical College, Amritsar. The study was conducted on eyes of 50 patients, 25 diabetic and 25 non diabetic visiting the outpatient department. The refractive status of the patients was measured by automated refractometer, and then refraction was done subjectively by means of Snellen’s test type charts. The Visual acuity scores for all the patients were recorded and were subject for analysis.

Material and Methods: The present study was conducted in the department of Anesthesia, Government Medical College, Amritsar. The study was conducted on eyes of 50 patients, 25 diabetic and 25 non diabetic visiting the outpatient department. After explaining the nature of the study a written informed consent was obtained from every participant. The protocol of the study was approved from the ethical committee of institute before beginning the study. The inclusion criteria for patients to participate in the study were:

• History of Diabetes for 6 years or more for patients in Diabetic group
• Negative history of diabetes for patients in Non-diabetic group

Exclusion criteria were:

• Any abnormality of cornea such as keratoconus, keratopathy, glaucoma, corneal and intraocular surgeries
• Systemic collagen related diseases
• Soft and hard contact lens wearer
• Systemic diseases such as hypertension, arthritis, and thyroid disease.

There are various diagrams utilized for visual sharpness testing, however the most well-known graphs are the Snellen outlines. The outline has letters of various sizes organized from biggest at the top to littlest at the base, which is perused, one eye at any given moment, at a separation of 6 meters (20 feet). Each letter on the outline subtends a point of 5 minutes (min) of bend at the proper testing separation, and each letter part subtends an edge of 1 min of curve.

Acknowledged tradition does not indicate Snellen acuity in precise terms; rather, Snellen acuities are for the most part communicated as a division with the numerator equivalent to the separate from the outline and the denominator being the smallest letters down the diagram. Visual acuity testing is the "highest quality level" for essential results of clinical trials. Hence, we planned the study to assess the visual acuity among diabetic patients. So the present study was planned to assess the visual acuity among diabetic patients.

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How to cite this article: Ajay Jurangal, Ankur Singh, Ramandeep Kaur Dhaliwal. Assessment of visual acuity among diabetic patients. International Journal of Contemporary Medical Research 2017;4(6):1311-1314.

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size of the littlest line that can be perused. The equal of the part levels with the point, in min of arc, that the stroke of the letter subtends on the patient’s eye and is called the minimum angle of resolution (MAR). The refractive status of the patients was measured by automated refractometer, and then refraction was done subjectively by means of Snellen’s test type charts. The Visual acuity scores for all the patients were recorded and were subject for analysis. The demographic data (age, sex) of the patients participating in the study were also recorded.

**STATISTICAL ANALYSIS**

The statistical analysis of the data was done using SPSS version 11.0 for windows. The statistical significance of the data was done using Chi-square test and Student’s t-test. A p-value of 0.05 and less were predetermined for statistical significance.

**RESULTS**

A total of 50 patients, 25 in Diabetic group and 25 in Non-Diabetic group participated in the study and completed their Visual acuity testing. In diabetic patients group, 15 patients were male and 10 patients were females. In Non-diabetic patients group 13 were males and 12 were females. As shown in Table 1, maximum numbers of diabetic patients, both male (n=10) and female (n=8) are in group 51-60 years age group which was not found to be statistically significant (P >0.05). [Figure 1]

Table 2 shows distribution of best corrected visual acuity. We observed that maximum number of diabetic eyes (30%) have best corrected visual acuity 6/18. In contrast to this, maximum no. of non-diabetic eyes (38%) has best corrected visual acuity 6/9. These results were statistically significant. (p<0.001). [Figure 2]

**DISCUSSION**

Vision is one of our most vital faculties. The estimation of vision is the essential result of most clinical trials and all

<table>
<thead>
<tr>
<th>Age-group</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. of Diabetic Patients</td>
<td>No. of Non-Diabetic Patients</td>
<td>No. of Diabetic Patients</td>
</tr>
<tr>
<td>31-40</td>
<td>1</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>41-50</td>
<td>4</td>
<td>4</td>
<td>-</td>
</tr>
<tr>
<td>51-60</td>
<td>6</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>61-70</td>
<td>3</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>71-80</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
<td>13</td>
<td>10</td>
</tr>
</tbody>
</table>

Table-1: Age and Sex wise distribution of patients

<table>
<thead>
<tr>
<th>Best corrected visual acuity</th>
<th>No. of diabetic eyes</th>
<th>No. of non diabetic eyes</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>6/60</td>
<td>1</td>
<td>-</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>6/36</td>
<td>4</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>6/24</td>
<td>5</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>6/18</td>
<td>15</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>6/12</td>
<td>10</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>6/9</td>
<td>10</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>6/6</td>
<td>5</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>50</td>
<td></td>
</tr>
</tbody>
</table>

Table-2: Distribution of Best Corrected Visual Acuity

**Figure-1:** Bar diagram representing Age and Sex wise distribution of patients

**Figure-2:** Bar diagram showing distribution of Best Corrected Visual Acuity
The present study was carried out for the assessment of visual acuity among diabetic patients. A total of 50 patients, 25 diabetic and 25 non-diabetic were included in the study. It was observed that maximum number of patients (both male and female) was present in the age group 51-60 years but this result was found to be non-significant. From the assessment of visual acuity of patients of both groups, we observed that best visual acuity of non-diabetic patients was higher as compared to diabetic patients and the result was statistically significant. These results are in agreement with previous similar studies conducted by various authors. Philip MC et al ascertained quality-of-life measures and utility values associated with visual acuity in type 2 diabetes. The therapeutic Outcome Study Short Form with 36 things (SF-36) was managed to 4,051 people with type 2 diabetes who were selected in the Lipids in Diabetes Study, and their best feasible vision was resolved utilizing an Early Treatment of Diabetic Retinopathy Study graph, communicated as a LogMAR score. Eight area scores and a utility esteem speaking to a general personal satisfaction score were ascertained utilizing predefined calculations. The affiliations between personal satisfaction measured and best-eye visual keenness were surveyed graphically and by relapse investigation. Each of the eight SF-36 area scores were adversely related with lessened visual sharpness. The effect of lower levels of visual keenness gone from a decrease of 1.3 units for a 0.1-LogMAR increment for physical working and 0.6 units in emotional wellness. Relapse examination showed a negative relationship amongst utility and lessened visual sharpness in the wake of controlling for sex, BMI, smoking status, and history of diabetes inconveniences. Patients whose LogMAR scores compared to legally blind had, on average, 0.054 lower utility compared with patients with normal visual acuity. The authors concluded that the reduced visual acuity is negatively associated with quality of life. Lövestam-Adrian M et al described the rate and movement of diabetic retinopathy in connection to therapeutic hazard markers and additionally visual sharpness result after a consistent follow-up time of 10 years in a Type 1 diabetic populace treated under routine care. The frequency and movement of retinopathy and their relationship to Hb(A1c), pulse, urinary albumin levels, serum creatinine levels, and insulin measurement were considered tentatively out of 452 Type 1 diabetic patients. In 2% (6/335), visual acuity dropped to <0.5 and in less than 1% (3/340) to < or =0.1. Patients who built up any retinopathy and patients who advanced to locale debilitating retinopathy had higher mean Hb(A1c) levels after some time contrasted with the individuals who stayed stable (P<.001 in both cases). Patients who built up any retinopathy had more elevated amounts of mean diastolic circulatory strain (P=.036), while no distinctions were seen in systolic pulse levels between the gatherings. Cox relapse examination, including all patients, demonstrated mean Hb(A1c) to be a free hazard pointer for both improvement and movement of retinopathy, though mean diastolic pulse was just a hazard marker for the rate of retinopathy. Metabolic control is a critical hazard pointer for both advancement and movement of retinopathy, though diastolic pulse is imperative for the improvement of retinopathy in Type 1 diabetes. The quantity of patients who ended up plainly daze amid 10 years of follow-up was low.11,12

Scanlon PH et al assessed the connection between best corrected visual acuity (BCVA), age, kind of diabetes, sight-threatening diabetic retinopathy (STDR) and visual co-dreariness. 1549 arbitrarily chose individuals with diabetes mellitus (DM) from a countywide computerized photofaceted screening program had institutionalized logarithm of least edge of determination BCVA estimation, trailed by opening light biomicroscopy examination by an accomplished ophthalmologist. Subnormal vision and visual impairment in the better-seeing eye were found in 9.0% and 0.45%. The affectability, specificity and positive and negative prescient benefits of utilizing subnormal vision to screen for STDR in an individual eye were 33.4%, 85.9%, 18.6% and 93.0%, separately. Critical contributory reasons for direct visual misfortune (logMAR 0.50 to 0.98, Snellen 6/18 or more terrible however superior to 6/60) and of Acuity Blindness (logMAR > or =1.0, Snellen 6/60 or more regrettable) in an individual eye were lenticular mistiness (counting capsular opacification) 49%, macular degeneration (counting nearsighted degeneration) 29%, diabetic maculopathy 15%, other media causes (counting corneal haziness) 13% and amblyopia 10%. It was reasoned that the dominant part of visual misfortune in a populace with diabetes is because of causes other than diabetic retinopathy. BCVA alone is not a dependable rule in foreseeing STDR. R Serban et al conducted a study with a purpose to follow up visual acuity in patients diagnosed with clinically significant macular edema and treated by an intravitreal injection of triamcinolone acetonide or in combination with bevacizumab. Based on the selectivity criteria they involved 295 patients (460 eyes), divided into 2 groups according to the treatment administered and one control group. The results showed a better preservation of the functional parameter for the group of patients treated with intravitreal injection of triamcinolone acetonide and bevacizumab.13-16

CONCLUSION

Based on the findings of present study, we conclude that non-diabetic eyes are found to be having better best corrected visual acuity than diabetic.

REFERENCES


Source of Support: Nil; Conflict of Interest: None
Submitted: 17-05-2017; Accepted: 25-06-2017; Published: 06-07-2017