Clinical Practice Article

Mean Best Corrected Visual Acuity after Intravitreal Bevacizumab in Patients with Diabetic Macular Edema

Anum Hanif[1], Qundeel Zahra[2], Atif Mansoor[3], Muhammad Arshad Mehmood[4], Muhammad Saeed[5]

[1,2,5]*Chaudary Muhammad Akram (CMA) Hospital, [3]Sheikh Zayed Hospital, [4]Al-Aleem Medical College, Lahore*

ABSTRACT

Purpose: To determine mean best corrected visual acuity after intravitreal bevacizumab in patients with diabetic macular edema.

Study Design: Quasi experimental study.

Place and Duration of Study: Jinnah Hospital, Lahore and Chaudary Muhammad Akram Hospital Lahore from March 2018 to May 2021.

Methods: A total of 200 patients of either gender with diabetic macular edema and age between 40 and 60 years were included in this study. Patients with dense cataract, corneal opacity, uncontrolled diabetes mellitus and those who were treated with pan retinal photocoagulation were excluded. Best corrected Visual Acuity (BCVA) was evaluated with Snellen chart and converted to log MAR. A standard protocol of 0.05mL of Bevacizumab was prepared from injection Avastin, 100mg/4mL vial. Bevacizumab injection was given to all patients, using topical anesthesia, under aseptic measures in the operation theater. A total of 03 injections were given at 1-month interval. After three months, BCVA was recorded. Results were presented in number and percentages.

Results: Mean age of the participants was 50.42 ± 6.48 years. Male to female ratio was 1:1.6, with 78 (39.0%) men and 122 (61.0%) women. Mean duration of diabetes mellitus was 5.12 ± 2.23 years. Mean pre-treatment BCVA was 0.51 ± 0.05 and mean post-treatment BCVA at three months was 0.26 ± 0.22.

Conclusion: Mean BCVA is increased after intravitreal injection of Bevacizumab in patients with diabetic macular edema.

Key Words: Bevacizumab, Visual Acuity, Macular Edema.

Correspondence: Muhammad Arshad Mahmood
Al- Aleem Medical College, Lahore
Email: drarshad2020@gmail.com

INTRODUCTION

Diabetic macular edema (DME) is a prime cause of decreased visual acuity in patients with diabetes.[1] According to WHO there are more than 150 million patients with diabetes worldwide. However, the absolute prevalence of DME might be increasing due to the overall increased prevalence of diabetes in industrialized nations.[2] Grid laser treatment was the gold standard for refractory DME, but has been almost completely replaced by pharmacological treatments such as intravitreal steroids and anti-vascular endothelial growth factor(VEGF).[3,4]Improving BCVA is a challenge in the management of diabetic macular edema. The purpose of this study is to determine the mean Best Corrected Visual Acuity (BCVA) after intravitreal bevacizumab injection in patients with diabetic macular edema in two tertiary care hospitals of Lahore.

METHODS

After approval from the ethical review committee, this study was conducted at the Department of Ophthalmology, Jinnah Hospital, Lahore and CMA Hospital, Lahore. A total of 200 patients of either gender and diagnosed with diabetic macular edema secondary to type II diabetes were selected by non-probability consecutive sampling. BCVA was measured using Snellen chart and converted to Log MAR equivalents. A standard protocol of 0.05 ml intravitreal Bevacizumab injection was given, using topical anesthesia, by an ophthalmologist. After three injections at one monthly interval, BCVA was evaluated. All findings and other variables (age, gender, duration of disease) were recorded on proforma. Data analysis was done using SPSS version 20.0. Mean and standard deviation were measured for age, duration of diabetes mellitus, and pre and post-therapy BCVA.

RESULTS

Age ranged from 40 to 60 years, with a mean age of 50.42 ± 6.48 years. According to Table 1, the bulk of the patients, or 154 (77.0%), were between the ages of 51 and 60 years. The mean duration of diabetes mellitus was 5.12 ± 2.23 years. These patients had a male to female ratio of 1:1.6, with 78 (39.0%) men and

Table 1: *Distribution of the patients according to age and duration of Diabetes.*

Age (Years)	Number of Patients	Percentage (%)
40 – 50	46	23.0
51 – 60	154	77.0
Total	**200**	**100.0**
Duration of Diabetes (Years)	**No. of Patients**	**%age**
≤5	108	54.0
>5	92	46.0

Table 2: *Stratification of mean post-therapy BCVA with respect to age groups, gender and duration of diabetes.*

Studied Parameter		BCVA After 3 Injections Mean ± SD
Age Groups	40 – 50	0.46 ± 0.03
	51 – 60	0.52 ± 0.04
Gender	Male	0.48 ± 0.05
	Female	0.53 ± 0.03
Duration of DM (Years)	≤ 5	0.53 ± 0.03
	> 5	0.48 ± 0.05

122 (61.0%) women (Table 2). In our study, the mean pre-therapy BCVA was 0.51 ± 0.05, and the mean post-therapy BCVA at 03 month was 0.26 ± 0.22.

DISCUSSION

With the rising ratio of diabetes in the world, diabetic retinopathy is the greatest threat to vision of patients with uncontrolled diabetes. According to the International Diabetes Federation, in 2022, 26.7% of adults in Pakistan are affected by diabetes making the total number of cases approximately 33,000,000.[5]

Although there is plenty of data regarding use of intravitreal anti-VEGF therapy for DME, but the amount to which this therapy is effective is variablle.[6]Khan et al have reported results of intravitreal Bevacizumab in a series of 26 eyes. After 3 months of intravitreal Bevacizumab injection, the mean BCVA improved from baseline of 0.726 Log MAR to 0.452 Log MAR.[7] There was no leakage on fluorescein angiography in 96% patients (25 eyes). In another study from Nepal including 87 eyes of 60 patients, there was a statistically significant decrease in central macular thickness and increase in BCVA.[8] Similarly, there are other studies which showed improved BCVA following intravitreal Bevacizumab injection.[9-11] However, there was difference in the duration of follow up.

Ozkiris showed results of 30 eyes, out of which 24 (80%) eyes showed improved visual acuity following intravitreal Bevacizumab injection at 6 months follow-up period.[12] At baseline, BCVA was 1.09 ± 0.23 Log MAR; in the first month, it was 0.90 ± 0.17 Log MAR; and at the last visit, it was 0.77 ± 0.26 Log MAR. Values on the edema map and the mean thickness both considerably dropped by 33.3%.

A study was conducted on the results of first intravitreal Bevacizumab injection in patients with diffuse diabetic macular edema on anatomic and visual outcomes over a period of 24 months.[13]They evaluated the effects of intravitreal Bevacizumab at doses of 1.25 mg and 2.5 mg. It was found that there was improvement in BCVA with both doses. Macular thickness and FFA also showed improvement.

Pan-American Collaborative Retina concluded that after one month of intravitreal injection of bevacizumab, a substantial reduction in DME occurred, and that persisted for up to six months.[13]

In another study, all patients were treated with 3 injections of 0.05 ml intravitreal injection containing

1.25 mg bevacizumab at monthly interval. Patients were followed up for 6 months and BCVA and OCT were taken at the final visit at 6th month. The study revealed that primary injection of 1.25 mg Bevacizumab on monthly intervals provided stability and improvement in BCVA and CMT in patient with DME.[14]

This particular study provides results of our local data. However, participants from only two institutions was a limitation.

CONCLUSION

This study concluded that the mean BCVA improved after intravitreal bevacizumab injection at 3 months in patients with diabetic macular edema.

Conflict of Interest: Authors declared no conflict of interest.

Ethical Approval

The study was approved by the Institutional review board/Ethical review board **(IRB/ANMC/2021/011).**

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Author's Designation and Contribution

Anum Hanif; Senior Registrar:*Concepts, Design, Literature Search, Data Acquisition, Data Analysis, Statistical Analysis, Manuscript Editing, Manuscript Review.*

Qundeel Zahra; Associate Professor:*Design, Literature Search, Data Acquisition, Statistical Analysis, Manuscript Preparation, Manuscript Editing, Manuscript Review.*

Atif Mansoor; Professor: *Literature Search, Data Acquisition, Data Analysis, Statistical Analysis, Manuscript Preparation, Manuscript Editing, Manuscript Review.*

Muhammad Arshad Mehmood; Professor: *Data Analysis, Manuscript Editing, Manuscript Review.*

Muhammad Saeed; Professor: *Literature Search, Manuscript Editing, Manuscript Review.*

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