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Comparing macular thickness and visual acuity responses retinal vein occlusion versus diabetic macular edema following anti vascular endothelial growth factor therapy: A retrospective analysis

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ABSTRACT

Background: Vascular growth factor associates Retinal vein occlusion (RVO) and Diabetic Macular Edema (DME). A retrospective analysis using database from a tertiary hospital.
Aim and Objective: The study aims to evaluate effects of anti-vascular growth factor therapy on patients Diabetic Macular Edema with and retinal vein occlusion,
Materials and Methods: This study conducted between December 2022 and June 2023 where 30 patients diagnosed with Diabetic macular edema (DME, n=15) or Retinal vein occlusion (RVO, n=15) receiving anti-VEGF were examined. This focused on changes in best corrected visual acuity, central macular thickness and predictors over a period of three months.
Results: Retinal Vein Occlusion (RVO) patients exhibited a more significant improvement in Best Corrected Visual Acuity (BCVA) compared to Diabetic Macular Edema (DME) (25 vs. 10 letters, p = 0.006) after three months. The change in Central Macular Thickness (CMT) also favored RVO (100μm) over DME (40μm, p = 0.012). Final BCVA median was 70 for DME and 65 for RVO (p = 0.461). Considering initial BCVA and CMT, RVO predicted better visual enhancement than DME.
Conclusion: RVO exhibited major BCVA improvement at three months with Anti-Vascular Endothelial Growth Factor. Final vision was indistinguishable for DME and RVO. Anti VEGF stabilizes DME vision. Despite the improvement, early RVO diagnosis and treatment may enhance final vision.

1. Introduction

Anti-vascular endothelial growth factor (anti-VEGF) intravitreal injections have transformed the management of retinal conditions. After the emergence of the first intravitreal anti-VEGF injection in 2000,[1] it has been on the forefront in treating many conditions of the eye including Neovascular age-related macular degeneration (nAMD), Diabetic macular edema and macular edema in Retinal vein occlusion (RVO), all paramount retinal causes of defect in vision.

Prevalence of Diabetes in India is 77 million which is anticipated to be over 134 million by 2045.[2] Altogether weighted prevalence in India was 12.5% (95% CI 11.0-14.2) for patients suffering from diabetic retinopathy and 4.0% (3.4-4.8) for patients suffering from vision-threatening diabetic retinopathy (VTDR). This likens to 3 million people living with vision-threatening diabetic retinopathy in India. Diabetic macular edema is the most common cause of visual impairment in patients with diabetes, especially type 2.[3] Blood retinal barrier disruption along with exudation of fluid from retinal blood circulation

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mediated predominantly by vascular endothelial growth factor is the main pathogenic mechanism for Diabetic macular edema.[4] A notable increase in VEGF protein levels in aqueous and vitreous humour along with elevated immuno staining is seen in patients with Diabetic macular edema.[5–7]

Following Diabetic retinopathy, Retinal vein occlusion (RVO) has been found to be the second most prevalent retinal cause of visual impairment.[8] It has also been identified in 0.8% of adults among central India economically disadvantaged central Indian population with branch retinal vein occlusion noted to be nearly seven times more frequent than central retinal vein occlusion.[9] Complications resulting from Retinal vein occlusion include macular edema(RVO-ME), neovascularisation with secondary vitreous haemorrhage, neovascular glaucoma etc which has a severe negative impact on patients' vision. The pathogenesis of RVO-ME is complex. The blood vessels being occluded and damaged, retinal ischaemia giving rise to localized hypoxia with elevated hypoxia inducible factor-1 alpha (HIF-1α) subsequently increasing secretion of vascular endothelial growth factor (VEGF). This may induce vascular permeability and formation of new blood vessels.[10,11] Anti-vascular endothelial growth factor has been substantiated to be very favorable to patients with retinal vein occlusion (RVO-ME) and has emerged as the first line therapy in the management of RVO-ME.[12–15] In addition to VEGF, the pathogenesis of RVO-ME also involves other factors like inflammatory cells and cytokines. Despite the sophisticated and distinct etiopathogenesis of DME and RVO-ME, there is an elevated presence of VEGF in both the conditions.[6 16]

Therefore, anti-VEGF agents are regarded as the primary choice of treatment in those conditions. There is paucity of data that compares the clinical outcomes in the two groups in real-world clinic-based setting. Quantification and comparison of visual acuity and central macular thickness were conducted pre and post anti-VEGF injection phases.

1.1. Lacunae in existing knowledge

Though few studies have been conducted in Western population, but there is paucity of studies in Indian Literature.

1.2. Research question

What are the visual outcomes of intravitreal anti-VEGF injections in DME compared to RVO?

1.3. Research hypothesis

Visual outcomes are better in RVO than in DME following anti-VEGF injection.

2. Aims and Objectives

A retrospective analysis to compare macular thickness and visual acuity responses in retinal vein occlusion and diabetic macular edema following anti-vascular endothelial growth factor therapy

2.1. Primary objectives

1. To evaluate the changes in visual outcome following anti-VEGF treatment in patients diagnosed with Retinal vein occlusion (RVO) vs Diabetic macular edema (DME)
2. To compare the changes in macular thickness following anti-vascular endothelial growth factor (anti-VEGF) therapy in patients diagnosed with retinal vein occlusion(RVO) and diabetic macular edema(DME).

2.2. Secondary objective

To explore the potential differences in treatment responses to anti-VEGF therapy based on factors such as age, gender and baseline disease severity in patients diagnosed with retinal vein occlusion (RVO) and Diabetic macular edema (DME).

3. Materials and Methods

This study was conducted in HNB Base Hospital, Srinagar Uttarakhand Ophthalmology department database in the duration of 6 months.

3.1. Study design

Retrospective cohort analysis. Prior to joining the biobank, a written consent was secured from each participant. The design and implementation of the study were carried out without the direct involvement of the patients.

3.2. Sample size calculation

Patients admitted for anti-VEGF therapy.

3.3. Inclusion criteria

1. Participants' data with a diagnosis of Diabetic Macular Edema (DME) or Retinal Vein Occlusion (RVO) and receiving anti-VEGF therapy between December 2022 to June 2023 in the hospital were included.
   {Diabetic Macular Edema patients were those with clinically diagnosed centre-involving and Central macular thickness(CMT) of $\geq 300\mu$m as determined by Spectral domain Optical Coherence Tomography(SD-OCT). Patients categorized in Retinal Vein Occlusion were those who exhibited macular edema because of clinically confirmed retinal vein occlusion}
2. Patients receiving a loading dose of at least one anti-VEGF injection with a subsequent follow-up period of

3 months after the anti-VEGF injection.
3. Patients receiving laser eye treatment either before or concurrently with anti-VEGF injections.

3.4. Exclusion criteria

1. Patients who underwent any systemic anti-VEGF therapy, intra-ocular steroid therapy or Vitreoretinal surgery within the 6 months preceding the initial injection.
2. Patients experiencing any severe opacity in the eye hindering a detailed fundus examination.
3. Patients with co-existing ocular diseases including uveitis etc.

3.5. Detailed methodology

This is a retrospective analysis which was carried out in the Department of Ophthalmology where retrospection collection of data after a thorough examination of medical record database for each injection during the three months following the initial injection. A written consent was secured from each participant before getting enrolled in the database.

3.6. Clinical data collection

Demographic data was collected of all the patients and comprehensive ophthalmic examinations for clinical characteristics were also noted. The collected data comprises ophthalmologic diagnosis, baseline best-corrected visual acuity (BCVA), Optical Coherence Tomography measurements, baseline central macular thickness, intraocular pressure, condition of the lens, details of anti-VEGF injections (type and quantity), age, gender, hypertension status, lipid profile and any negative drug reactions following intravitreal anti-vascular endothelial growth factor injection. Snellen's visual acuity score was employed to document best corrected visual acuity with subsequent conversion into numerical values. Central macular thickness was assessed through SD-OCT. Changes in BCVA and CMT were ascertained by comparing the values just preceding the initial injection with those measurement taken during the 3-month follow-up. The injection number indicated the total number of injections administered by the end of the three-month period from the date of the initial injection. Patients on antihypertensive medications were categorized as hypertensive and those patients on lipid lowering drugs were labelled as hyperlipidaemic.

3.7. Intravitreal injection of anti-VEGF reagents

Administered at the temporal limbus, the intravitreal injection employed a 3.5mm entry point for pseudophakics and 4 mm entry point for phakics. This meticulous procedure was conducted through the eyeball's pars plana in the operating room adhering to aseptic conditions Each patient was administered a single intravitreal injection of Ranibizumab at the concentration of 0.5mg/0.05 ml utilizing a 27-guage needle.

3.8. Optical coherence tomography macula examination

Retinal microvasculature examination was conducted by employing Optical Coherence Tomography by Topcon 3D OCT-1 Maestro2 system. The scanning process was focused on the fovea with an area of 6×6 mm2. Central macular thickness (CMT) assessed through OCTA was computed by averaging retinal thickness in a circular region with a 1mm diameter centered at the fovea and this analysis was automatically performed.

3.9. Outcome measures

The primary focus was on evaluating the shift in best corrected visual acuity three months post the initial intravitreal anti-VEGF injection. Additional measures encompassed changes in central macular thickness, the ultimate best corrected visual acuity and the emphasis on the ultimate central macular thickness. These evaluations were compared across the two distinct disease categories: Diabetic macular edema and Retinal vein occlusion.

We segregated patients based on functional and anatomical responses, allowing for a detailed scrutiny and thorough data investigation. Patient was deemed a functional responder on demonstrating a 15-letter or more enhancement from the baseline ETDRS letters whereas an anatomical responder as one exhibiting a reduction in CMT of 10% or more from the baseline. Additionally, examination of the potential clinical and demographic factors that could predict the functional and anatomical responders were done.

3.10. Statistical analysis

Statistical Package for Social Sciences (SPSS) software by IBM manufacturer, Chicago, USA, version 25.0 used for all analysis.

Variables which were categorical were expressed through number and percentages (%). Also, the quantitative data which shows normality in distribution were expressed as mean ±SD and the data which did not show normal distribution were expressed as median with 25^{th} and 75^{th} percentiles (interquartile range). Kolmogorov-Smirnov test was used for data that showed normality and non-parametric test were applied for non-normal data. Statistical tests include Mann-Whitney Test for non-normal distributed quantitative variables between the two groups and an independent t test for normally distributed quantitative variables. Chi-Square test was used to analyse qualitative

variables and Fisher's exact test was used when any cell had an expected value of less than 5. Univariate logistic regression was used to predict significant risk factors of ≥15 ETDRS letters increase and ≥10% decrease in CMT (%). Data entry was conducted in a spreadsheet of Microsoft EXCEL. If the p-value is less than 0.05, it is considered as significant.

4. Results

A total of 30 patients who had received the anti VEGF injections were enrolled into the study, based on the inclusion criteria predefined in the protocol. A comprehensive history taking, and examination was done for all the patients including demographic and ophthalmic examination. As per the study, it was noted that in those individuals with DME, 7 (46.67%) were males, and 8 (53.33%) were females. Among the patients who were diagnosed with RVO, 6 (40%) were males and 9 (60%) were females. As the p-value was 0.713) it was found that there was no statistical significance in gender distribution. In those patients diagnosed with DME, 7 (46.67%) had involvement in the right eye while the other 8 individuals, (53.33%) had left eye involvement. Among those diagnosed with RVO, 5 (33.33%) had involvement in the right eye, and 10 (66.67%) had left eye involvement. The p-value (0.456) indicates that there was no statistical significance in the difference in eye laterality between the groups. In studying the lens status, it was noted that among individuals with DME, 7 (46.67%) had a phakic lens status, and 8 (53.33%) had a pseudophakic lens. However, among the patients diagnosed with RVO, 9 (60%) had a phakic lens status, and 6 (40%) had a pseudophakic lens status. The p-value was found to be 0.464 which showed that there was no significant difference in lens status between the groups and was no statistical significance. In the group with hypertension, it was found that amongst those diagnosed with DME, 13 individuals (86.67%) had hypertension, and amongst those patients with RVO, 10 individuals (66.67%) had hypertension. The p-value was 0.39 suggesting that there might be an association between hypertension and the two conditions mentioned. On considering hyperlipidemia, it was found that in patients with DME, 11 individuals (73.33%) had hyperlipidemia, and among those with RVO, 4 individuals (26.67%) had hyperlipidemia. The p-value was found to be 0.027 which indicates that it was statistically significant and hence there might be an association between hyperlipidemia and the two conditions. The mean age for both DME and RVO groups was found to be 69.4 years. The p-value was found to be 1.0 which indicates that there was no significant difference in age between the two groups. The median baseline for Central Macular Thickness (CMT) for DME and RVO was found to be 356μm and 412μm respectively. The combined median baseline CMT for both was 383.5μm. The p-value was 0.056 which suggested that there was a potential difference in baseline CMT between the fore mentioned two groups. The median baseline Best-Corrected Visual Acuity (BCVA) for DME and RVO was 60 letters and 45 letters respectively. The p-value was found to be 0.12 which indicated that there was no significant difference in baseline BCVA between the two groups.

4.1. Outcome assessments after 3 months according to disease type

At the end of 3 months of anti-VEGF therapy, documented in (Table 2), the final Central Macular Thickness (CMT) (μm) showed that the median CMT for both DME (300μm) and RVO (315μm) groups were similar, with a slight numerical difference in the data. It was found that the p value was 0.693 which was not statistically significant. This data proved that the final CMT measurement was comparable between the two group regarding the Change in CMT (μm). The median change in CMT between DME was 40μm and RVO was 100μm. The p value was 0.012 which showed that there was statistical significance between the median change of CMT in both the groups. This indicated that the individuals with RVO experienced a more substantial change in CMT on comparing to those with DME. The variation in change implied that there was a difference in the treatment responses or disease progression in the RVO group. The final Best-Corrected Visual Acuity (BCVA) (ETDRS letters) had a median final BCVA of 70 letters for DME and 65 letters for RVO. This data had a p value of 0.461 which had no statistical significance. Hence, it suggested that the final visual acuity was relatively comparable between the two groups. The median change in BCVA was 10 letters in the DME group and 25 letters in the RVO group. The p value was 0.006 and hence the data was found to be statistically significant. This indicated that the patients with RVO experienced a more significant improvement in BCVA as compared to those with DME. The larger increase in BCVA for RVO reflected the treatment effectiveness or the nature of the diseases.

4.2. Variation in outcome indicators depending on functional and anatomical responses

As seen in (Table 3), the patients in the DME group showed that 2 out of 15 patients (13.33%) showed an increase of ≥15 ETDRS letters in their visual acuity while those in the RVO group had a substantial portion of 12 out of 15 patients (80%) who had exhibited an increase of ≥15 ETDRS letters. The p-value associated with the Fisher's exact test was found to be 0.0007 which was statistically significant. Hence, the likelihood of achieving a significant increase in visual acuity (≥15 ETDRS letters) was higher in the RVO group in comparison to the DME group.

In the DME group, 9 out of 15 patients (60%) showed a ≥10% decrease in CMT which those in the RVO group,

Table 1: Comparison of baseline and clinical characteristics between DME and RVO

Baseline and clinical characteristics	DME(n=15)	RVO(n=15)	Total	P value
Gender				
Male	7 (46.67%)	6 (40%)	13 (43.33%)	0.713Ď
Female	8 (53.33%)	9 (60%)	17 (56.67%)	
Laterality of eye				
Right eye	7 (46.67%)	5 (33.33%)	12 (40%)	0.456Ď
Left eye	8 (53.33%)	10 (66.67%)	18 (60%)	
Lens status				
Phakic	7 (46.67%)	9 (60%)	16 (53.33%)	0.464Ď
Pseudophakic	8 (53.33%)	6 (40%)	14 (46.67%)	
Hypertension	13 (86.67%)	10 (66.67%)	23 (76.67%)	0.39*
Hyperlipidemia	11 (73.33%)	4 (26.67%)	15 (50%)	0.027*
Age(years)	69.4 ± 12.25	69.4 ± 11.24	69.4 ± 11.55	1Ě
Baseline CMT(μm)	356(325-402)	412(373-438)	383.5(335.5-422.75)	0.056§
Baseline BCVA(EDTRS letters)	60(35-60)	45(25-45)	45(35-60)	0.12§

Ě Independent t test, § Mann Whitney test, * Fisher's exact test, Ď Chi square test

Table 2: Comparison of outcome measures between DME and RVO

Outcome measures	DME(n=15)	RVO(n=15)	Total	P value
Final CMT(μm)	300(289.5-369.5)	315(291.5-345)	313.5(288.25-355.25)	0.693§
Chane in CMT(μm)	40(28-54.5)	100(44.5-143.5)	53.5(32.5-103)	0.012§
Final BCVA(EDTRS letters)	70(50-70)	65(60-75)	67.5(55-70)	0.461§
BCVA change(EDTRS letters)	10(7.5-10)	25(15-32.5)	10(10-25)	0.006§

§ Mann Whitney test

12 out of 15 patients (80%) experienced a ≥10% decrease in CMT. The p-value associated with the Fisher's exact test was 0.427, which was not statistically significant. Therefore, the proportion of patients achieving a ≥10% decrease in CMT was relatively comparable in the DME and RVO groups of patients.

4.3. Predictors of functional response

The univariate logistic regression analysis seen in (Table 4) aimed at identifying the significant risk factors associated with achieving a ≥15 ETDRS letters increase in the visual acuity. In the measure with regards to the Age of the patient (in years), this showed that there was no significant association with the likelihood of achieving a ≥15 ETDRS letters increase, indicated by the odd ratio close to 1(0.996) and p-value of 0.906, The showed that age did not play a significant role in this outcome. Similarly, with regards to the baseline central macular thickness (CMT) which showed a marginal association by the p-value of 0.097. This indicated that it may have a limited influence on achieving the outcome. The Baseline best corrected visual acuity (BCVA) also displayed a marginal association with a p-value of 0.102, thus, suggesting that the initial BCVA might have some effect but not at a statistically significant level. In the parameter with gender, more specifically with the female gender, the data had a p value of 0.188 which was not statistically significant and hence did not predict a ≥15 ETDRS letters increase. Regarding the laterality of the eye, the left eye was found to not have a strong predictor as the p value was 0.064, and hence was not statistically significant. With regards to the Lens status of the patients, the patients who were pseudo phakic did not show a statistically significant connection with the outcome as the p-value was found to be 0.089. Similarly, hypertension did not show a significant association with the outcome, as the p-value was found to be 0.286, and hence was not statistically significant. In those patients with hyperlipidaemia, the data also displayed a lack of significant association as the p-value was 0.177, therefore suggesting that it did not play a critical role in achieving the ≥15 ETDRS letters increase. However, having a diagnosis of retinal vein occlusion (RVO) was found to be a significant predictor, with a very low p-value of 0.001 and a high odds ratio, indicating a strong positive association with achieving the ≥15 ETDRS letters increase.

4.4. Predictors of anatomical response

The results of the univariate logistic regression analysis was aimed at identifying significant risk factors associated with those achieving a ≥10% decrease in central macular

Table 3: Comparison of functional and anatomical response between DME and RVO

Functional and anatomical response	DME(n=15)	RVO(n=15)	Total	P value
≥15 ETDRS letters increase	2 (13.33%)	12 (80%)	14 (46.67%)	0.0007*
≥10% decrease in CMT (%)	9 (60%)	12 (80%)	21 (70%)	0.427*

* Fisher's exact test

Table 4: Univariate logistic regression to find out significant risk factors of ≥15 ETDRS letters increase

Variables	Beta coefficient	Standard error	P value	Odds ratio	Odds ratio Lower bound (95%)	Odds ratio Upper bound (95%)
Age(years)	-0.004	0.032	0.906	0.996	0.935	1.061
Baseline CMT(μm)	0.011	0.007	0.097	1.011	0.998	1.025
Baseline BCVA(EDTRS letters)	-0.040	0.025	0.102	0.960	0.915	1.008
Gender						
Male				1.000		
Female	-1.001	0.760	0.188	0.368	0.083	1.630
Laterality of eye						
Right eye				1.000		
Left eye	1.514	0.816	0.064	4.545	0.918	22.510
Lens status						
Phakic				1.000		
Pseudophakic	-1.321	0.777	0.089	0.267	0.058	1.225
Hypertension	0.993	0.930	0.286	2.701	0.436	16.723
Hyperlipidemia	-1.021	0.756	0.177	0.360	0.082	1.585
Diagnosis						
DME				1.000		
RVO	3.111	0.967	0.001	22.446	3.374	149.332

Table 5: Univariate logistic regression to find out significant risk factors of ≥10% decrease in CMT (%)

Variables	Beta coefficient	Standard error	P value	Odds ratio	Odds ratio Lower bound (95%)	Odds ratio Upper bound (95%)
Age (years)	0.068	0.039	0.081	1.070	0.992	1.154
Baseline CMT(μm)	0.014	0.008	0.089	1.014	0.998	1.031
Baseline BCVA(EDTRS letters)	-0.006	0.024	0.819	0.994	0.948	1.043
Gender						
Male				1.000		
Female	0.082	0.793	0.918	1.085	0.229	5.133
Laterality of eye						
Right eye				1.000		
Left eye	0.858	0.806	0.287	2.359	0.486	11.450
Lens status						
Phakic				1.000		
Pseudophakic	-0.476	0.793	0.548	0.621	0.131	2.939
Hypertension	-0.955	1.075	0.374	0.385	0.047	3.165
Hyperlipidemia	-0.291	0.791	0.712	0.747	0.159	3.520
Diagnosis						
DME				1.000		
RVO	0.891	0.817	0.276	2.437	0.491	12.088

thickness (CMT) as mentioned in (Table 5). Age of the patient (in years) exhibited a marginally significant association with the likelihood of achieving a ≥10% decrease in CMT, as indicated by a beta coefficient of 0.068 and a p-value of 0.081. This showed that age had a slight influence on the outcome, with an odds ratio of 1.070. Baseline CMT displayed a similar marginal association with a beta coefficient of 0.014 and a p-value of 0.089. This suggested that the initial CMT had a limited impact on achieving the outcome, with an odds ratio of 1.014. Baseline best corrected visual acuity (BCVA) showed no significant association, with a p-value of 0.819, suggesting that initial BCVA did not play a significant role in achieving the ≥10% decrease in CMT. In the data with gender, particularly with females, it did not significantly predict a ≥10% decrease in CMT, as the p value was found to be 0.918. With regards to the Lens status (phakic or pseudophakic), it was found that it did not significantly predict the outcome, with both categories having p-values above 0.5. Neither smoking history nor hypertension displayed a significant association, as indicated by their respective p-values of 0.567 and 0.374. Hyperlipidaemia also did not show a significant association (p-value = 0.712) with achieving the ≥10% decrease in CMT. However, having a diagnosis of retinal vein occlusion (RVO) was found to have a marginally significant association (p-value = 0.276) with achieving the outcome, suggesting that RVO had a limited impact on achieving a ≥10% decrease in CMT, with an odds ratio of 2.437.

5. Discussion

This research indicates notable distinctions in the treatment outcomes between individuals with DME and RVO who undergo anti-VEGF therapy. Those with DME demonstrated comparatively modest improvements in vision compared to their RVO counterparts. Participants with lower baseline BCVA saw enhanced vision, while individuals with higher CMT experienced more substantial reductions in thickness. Factoring in initial BCVA and CMT, patients diagnosed with RVO had better visual outcomes when compared to those with DME. In our study, patients with DME had a more favorable initial vision when compared to the other group. Previous research has established the correlation between the initial vision and visual acuity changes,[17] as reflected in our study. The absence of improvement in BCVA in the Diabetic macular edema group at the 3-month mark may be partially attributed to a ceiling effect, indicating limited potential for enhancement.[18] In other words, the DME group started with a higher baseline BCVA and since the BCVA improvement is typically measured on a scale, those individuals who already had good vision at the beginning might not have shown significant improvement, making it appear as if their progress has reached a ceiling or upper limit. The presence of a ceiling effect in this case means that the DME group had less room for improvement in their BCVA compared to the other groups, potentially influencing the results of the study and highlighting the importance of considering baseline levels when interpreting the outcomes of intervention or treatments. Based on the comparison of functional and anatomical responses between DME and RVO, it appears that individuals with RVO have a significantly higher likelihood of achieving a substantial increase (≥15 ETDRS letters) in visual acuity compared to those with DME. When considering the outcome of 10% or more reduction in CMT, differences observed were not statistically significant between the two groups. These findings provide valuable insights into the differential treatment responses and outcomes for these two retinal conditions. Comparable vision was exhibited on assessing the efficacy of anti-VEGF in both the diseases in randomized control trials (RCTs. Studies like Wells JA et al. in patients with Diabetic macular edema observed that they achieved 5.9-13.3 ETDRS letters[19,20] which is equivalent to then our study where patients achieved 10 letters median (7.5-10) (p=0.006). Likewise, the study by Jacob G. Light et al. in patients with retinal vein occlusion reported that the patients achieved 20 ETDRS letters (range -9 to 80 ETDRS letters)[21] which is consistent to our study where patients achieved 25 letters median (range 15-32.5) in RVO (p=0.006).The existing research has certain limitations to consider. To begin with, the sample size in this clinical study is relatively limited, potentially influencing the validity of comparisons. Besides, the period study was for a brief duration indicating the necessity for a more extended follow-up. Lastly, OCT measurements, crucial in clinical care and research, are susceptible to factors related to patients (media opacity, cooperation, macular changes) and as those related to software (resolution, segmentation) factors. These factors can impact measurement repeatability and lead to errors in interpreting OCT parameters.[22,23]

6. Conclusion

This study compares visual outcomes in RVO and DME patients receiving anti-VEGF treatment. RVO patients improve more, while DME patients start with better vision. Anti-VEGF may prevent vision loss in DME, but RVO patients can reach comparable vision. Early diagnosis and treatment could improve final vision. A larger, balanced study is suggested for better comparisons. There is keen interest in long-term differences between the two diseases. Also, an extended study is recommended.

7. Source of Funding

None.

8. Conflict of Interest

None.

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