Annals of International Medical and Dental Research
E-ISSN: 2395-2822 | P-ISSN: 2395-2814
Vol-9, Issue-3 | May- June 2023
DOI: 10.53339/aimdr.2023.9.3.21
Page no- 168-176 | Section- Research Article (Ophthalmology)

The Clinical Outcome of Brolucizumab in the Treatment of Neovascular Age-Related Macular Degeneration - A Prospective Observational Study

Ziaul Ahsan Mukta[1]*, Dilara Khatun[2], Tasnim Khanom[3], Mashrur Al Bashir[4], Al- Nawaz[5], Nabila Noor Dutee[6]

*[1]Consultant, Department of Ophthalmology, Bangladesh Eye Hospital & Institute Ltd, Dhaka, Bangladesh.
Email: drziaulahsan@gmail.com
Orcid ID: 0009-0009-3948-6056
[2]Consultant, Department of Ophthalmology, Bangladesh Eye Hospital & Institute Ltd, Dhaka, Bangladesh.
Email: dilaraophthal@gmail.com
Orcid ID: 0000-0003-3172-3685
[3]Associate Professor, Department of Ophthalmology, Dr. Sirajul Islam Medical College & Hospital Ltd, Dhaka, Bangladesh.
Email: tasnim.chomon@gmai.com
Orcid ID: 0000-0002-1507-2299
[4]Medical Officer, Department of Ophthalmology, National Institute of Ophthalmology & Hospital, Dhaka, Bangladesh.
Email: bashir.mashrur@gmail.com
Orcid ID: 0009-0000-4273-3438
[5]Medical Officer, Department of Ophthalmology, Bangladesh Eye Hospital & Institute Ltd, Dhaka, Bangladesh.
Email: alnawaz009@gmail.com
Orcid ID: 0009-0004-6624-673X
[6]Medical Officer, Department of Ophthalmology, Bangladesh Eye Hospital & Institute Ltd, Dhaka, Bangladesh.
Email: noornabila2012@gmail.com
Orcid ID: 0009-0007-6562-1405
*Corresponding author

Received: 13 February 2023
Revised: 13 March 2023
Accepted: 26 March 2023
Published: 30 April 2023

Abstract

Background: Neovascular age-related macular degeneration (nAMD), also known as wet AMD, is a chronic eye disease that affects the macula, which is the central part of the retina responsible for sharp, central vision. Brolucizumab is a type of anti-vascular endothelial growth factor (VEGF) drug, which works by blocking the activity of a protein called VEGF that promotes the growth of abnormal blood vessels under the macula in neovascular AMD. The aim of this study was to evaluate the clinical outcome of brolucizumab in the treatment of neovascular age-related macular degeneration. **Material & Methods:** This prospective observational study was conducted in Department of Ophthalmology, Bangladesh Eye Hospital & Institute Ltd, Dhaka, Bangladesh, during the period from February 2022 to February 2023. Total 60 patients with neovascular AMD were included in this study who were treated with brolucizumab. **Results:** The mean age of the patients was 74.3 (SD±9.8) years. Majority of the study subjects were (51.7%) female patients in the study. In our study, majority (38.3%) of the patients had only their right eye affected. In optical coherence tomography (OCT) findings, we found that a high percentage of patients had subretinal fluid (85%), intraretinal fluid (61.7%), and sub-RPE fluid (83.3%). The BCVA showed a significant change after 12 weeks of treatment, as indicated by the P-value of 0.0007. Here improvement of vision was seen in patients with AMD with active Choroidal neovascularization (CNV). But in case of AMD with macular scar, no improvement of vision was seen. In addition, the SRT, FCP, and CMT parameters also showed a statistically significant (P<0.001) improvement after brolucizumab treatment. In our study, 4 patients (6.7%) experienced intraocular inflammation, which is inflammation within the eye, 2 patients (3.3%) reported cloudy vision, and 3 patients (5%) experienced eye redness as a complication of the treatment. The majority of the patients, 51 (85%) did not experience any complications from the treatment. After treatment, improved vision was seen in most of the study patients (70%) and 30% had no improvement. **Conclusion:** From the findings of our study, it can be concluded that brolucizumab may be an effective treatment for neovascular AMD, as it can improve the best-corrected visual acuity and structural outcomes of the retina such as subfoveal retinal thickness, foveal center point, and central macular thickness. There was also a tolerable complication rate after treatment.

Keywords:- Clinical Outcome, Brolucizumab, Treatment, and Neovascular Age-Related Macular Degeneration.

Annals of International Medical and Dental Research
E-ISSN: 2395-2822 | P-ISSN: 2395-2814
Vol-9, Issue-3 | May- June 2023
DOI: 10.53339/aimdr.2023.9.3.21
Page no- 168-176 | Section- Research Article (Ophthalmology)

INTRODUCTION

Age-related macular degeneration (AMD) is a chronic, progressive condition of the retina's macular area that affects people over 65 and causes permanent loss of central vision.[1] With 8.7% of all blindness worldwide attributable to this ocular disorder, it continues to be the predominant factor in severe vision loss in industrialized nations.[2] There are approximately 288 million instances of AMD reported globally, with the number anticipated to rise to 196 million cases by 2040.[2] AMD is classified into two types: neovascular AMD (nAMD) or wet and dry AMD. Just 20% of AMD patients have the neovascular type of the disease, yet this group accounts for most cases of more severe and fast vision loss.[3] The primary feature of nAMD is the development of choroidal neovascularization (CNV), which is made up of new, diseased, and immature blood vessels. Infiltration of fluid that has collected intraretinal, subretinal, or behind the retinal pigment epithelium may occur from this pathological angiogenesis (RPE). Hard exudates, hemorrhages, RPE rips, or the emergence of a disciform scar are further clinical nAMD symptoms. In the absence of the proper therapeutic intervention, these clinical abnormalities gradually harm photoreceptors, lowering visual acuity.[4,5,6,7,8] Age is the biggest non-modifiable risk factor for AMD, while the illness has a complex etiology.[4] Smoking and certain dietary habits have repeatedly been linked to an increased risk of AMD. The development of AMD is also likely to be influenced by hyperlipidemia and hypertension. Moreover, there is a significant genetic component because the etiology of AMD has been linked to several genetic variations.[4] To maintain or increase visual acuity, nAMD treatment focuses on preventing angiogenesis and vascular leakage.[9] Since that vascular endothelial growth factor (VEGF) plays a major role in the formation of CNV, the introduction of VEGF inhibitors has shown outstanding visual results in nAMD patients.3,6 Brolucizumab, an intravitreal anti-VEGF medication, was authorized for treatment of neovascular age-related macular degeneration (nAMD) by the US Food and Drug Administration on October 8, 2019, followed by clearance by the European Medicines Agency in February 2020.[10,11,12,13,14] The anti-vascular endothelial growth factor (VEGF) A fragment is a humanized single-chain variable antibody fragment that binds to all human isoforms of the protein.[15,16,17,18,19] Because of its tiny molecular size of 26 kDa, excellent solubility, and other pharmacologic characteristics, it may attain 10 times greater molar concentrations than aflibercept.[17,18,19,20] These qualities are thought to be the cause of the subfoveal retinal thickness (SRT) decrease that was more pronounced on optical coherence tomography (OCT) scans and the possible extended durability that may have been shown in the pivotal phase 3 clinical HAWK and HARRIER studies.[17,18,19,20,21,22] Recent pivotal studies have demonstrated that brolucizumab is not inferior to the comparison aflibercept in terms of visual result. Post hoc analysis revealed favorable anatomical effects across the board.[23,24] Nevertheless, safety indications, such as intraocular inflammation (IOI) and retinal vasculitis with or without occlusion, have been noted in both RCTs and post-marketing reports.[21] The current study was conducted to evaluate the clinical outcome of brolucizumab in the treatment of neovascular age-related macular degeneration.

Annals of International Medical and Dental Research
E-ISSN: 2395-2822 | P-ISSN: 2395-2814
Vol-9, Issue-3 | May- June 2023
DOI: 10.53339/aimdr.2023.9.3.21
Page no- 168-176 | Section- Research Article (Ophthalmology)

Objectives

To evaluate the clinical outcome of brolucizumab in the treatment of neovascular age-related macular degeneration.

MATERIAL AND METHODS

This prospective observational study was conducted in Department of Ophthalmology, Bangladesh Eye Hospital & Institute Ltd, Dhaka, Bangladesh, during the period from February 2022 to February 2023. Total 60 patients with neovascular age-related macular degeneration (nAMD) were included in this study. All patients were treated with brolucizumab 6mg up to 12 weeks observational period with 4 weeks gap between treatment. At each visit, best- corrected visual acuity (BCVA) determination and complete ophthalmic examination, including slit-lamp examination and funduscopy following pupil dilation, was performed. Retinal imaging was performed at each visit with spectral- domain optical coherence tomography (SD- OCT). Consent of the patients and guardians were taken before collecting data. After collection of data, all data were checked and entered into computer and statistical analysis of the results being obtained by using windows-based computer software devised with Statistical Packages for Social Sciences version 22. P value of less than 0.05 was considered statistically significant.

RESULTS

[Table 1] demonstrates the demographic characteristics of the study people. The mean age of the patients was 74.3 (SD±9.8) years ranged from 52 to 83 years. Majority of the study subjects were (51.7%) female patients in the study. In our study, about 38.3% patients had only their right eye affected, 35.0% had only their left eye affected, and 26.7% had both eyes affected. [Table 2] shows the optical coherence tomography (OCT) findings related to fluid in the retina. The table indicates that a high percentage of patients had subretinal fluid (85%), intraretinal fluid (61.7%), and sub-RPE fluid (83.3%). [Table 3] shows the functional and structural outcomes at baseline and after using to brolucizumab. In our study, the best-corrected visual acuity (BCVA) at start of the treatment was 0.39±0.29 and after 12 weeks of treatment was 0.20±0.31 and there was statistically significant change, as indicated by the P-value of 0.0007. Here improvement of vision was seen in patients with AMD with active Choroidal neovascularization (CNV). But in case of AMD with macular scar, no improvement of vision was seen. In addition, the CSRT, FCP, and CMT parameters also showed a statistically significant ($P<0.001$) improvement after brolucizumab treatment. At baseline CSRT was 417.37±102.47 µm, FCP was 363.32±133.39 µm and CMT was 476±156 µm. At 12th week, CSRT was 328.25±90.50 µm, FCP was 272.80±122.40 µm and CMT was 292±144 µm. The mean values for these parameters decreased after treatment. [Table 4] represents the complications that occurred after treatment. In our study, 4 patients (6.7%) experienced intraocular inflammation, which is inflammation within the eye, 2 patients (3.3%) reported cloudy vision, and 3 patients (5%) experienced eye redness as a complication of the treatment. The majority of the patients, 51 (85%) did not experience any complications from the treatment. [Figure 1] shows the outcome after treatment of brolucizumab

Annals of International Medical and Dental Research
E-ISSN: 2395-2822 | P-ISSN: 2395-2814
Vol-9, Issue-3 | May- June 2023
DOI: 10.53339/aimdr.2023.9.3.21
Page no- 168-176 | Section- Research Article (Ophthalmology)

among nAMD patients. Improved vision was seen in most of the study patients (70%) and 30% had no improvement. [Figure 2 and 3] demonstrates the OCT findings of patients. Figure 4 shows the CFP view of macula.

Table 1: Demographic characteristics of the study people (N=60)

Characteristics		**n**	**%**
Age	Mean ± SD	74.3 ±9.8	
	Range	52-83	
Sex	Male	29	48.3
	Female	31	51.7
Affected eye	Only right	23	38.3
	Only left	21	35.0
	Both	16	26.7

Table 2: Optical coherence tomography (OCT) findings related to fluid in retina (N=60)

OCT findings	**n**	**%**
Subretinal fluid	51	85.0
Intraretinal fluid	37	61.7
Sub- RPE fluid	50	83.3

RPE= retinal pigment epithelium

Table 3: Functional and structural outcomes at baseline and after using to brolucizumab (N=60)

Parameter	**Baseline**	**After treatment**			**P-value**
		At 4th week	**At 8th week**	**At 12th week**	
BCVA (logMAR)	0.39±0.29	0.30 ± 0.29	0.26 ± 0.30	0.20±0.31	0.0007[S]
SRT (µm)	417.37±102.47	398±94.68	361.92.20	328.25±90.50	<0.001[S]
FCP (µm)	363.32±133.39	348±129.47	292±126.55	272.80±122.40	<0.001[S]
CMT (µm)	476±156	410±150	365±149	292±144	<0.001[S]

BCVA= best-corrected visual acuity; SRT= Subfoveal retinal thickness; FCP= foveal center point. CMT=Central macular thickness.
P value reached from unpaired t-test
S= Significant ($p<0.05$)

Table 4: Complications after treatment of brolucizumab among nAMD patients (N=60).

Complication	**n**	**%**
Intraocular inflammation	4	6.7
Cloudy vision	2	3.3
Eye redness	3	5.0
No complication	51	85.0

Annals of International Medical and Dental Research
E-ISSN: 2395-2822 | P-ISSN: 2395-2814
Vol-9, Issue-3 | May- June 2023
DOI: 10.53339/aimdr.2023.9.3.21
Page no- 168-176 | Section- Research Article (Ophthalmology)

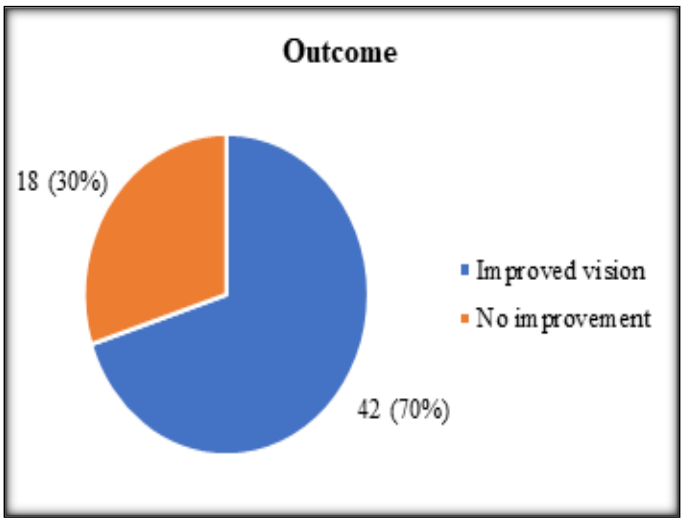

Figure 1: Outcome after treatment of brolucizumab among nAMD patients (N=60).

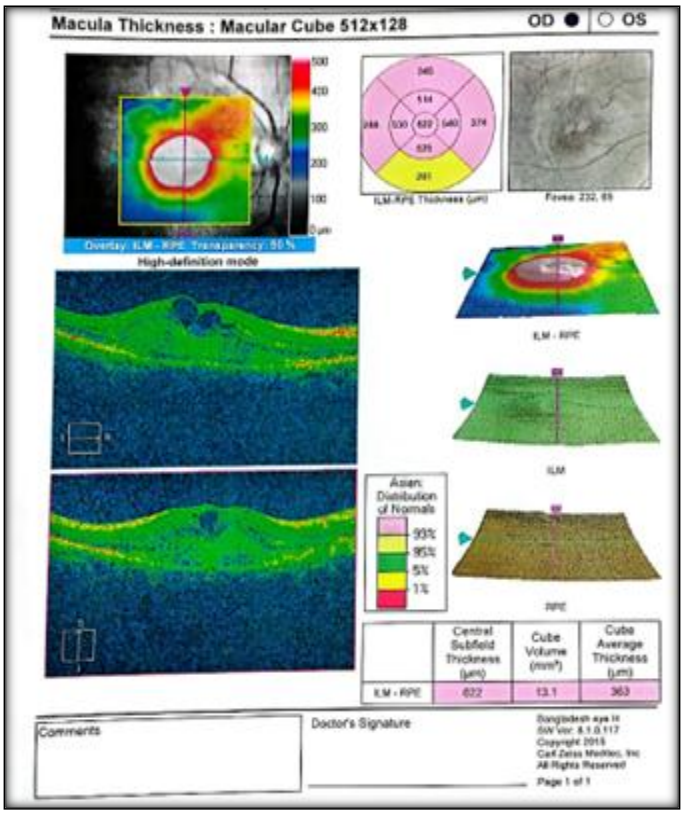

Figure 2: OCT finding of a patient before brolucizumab treatment

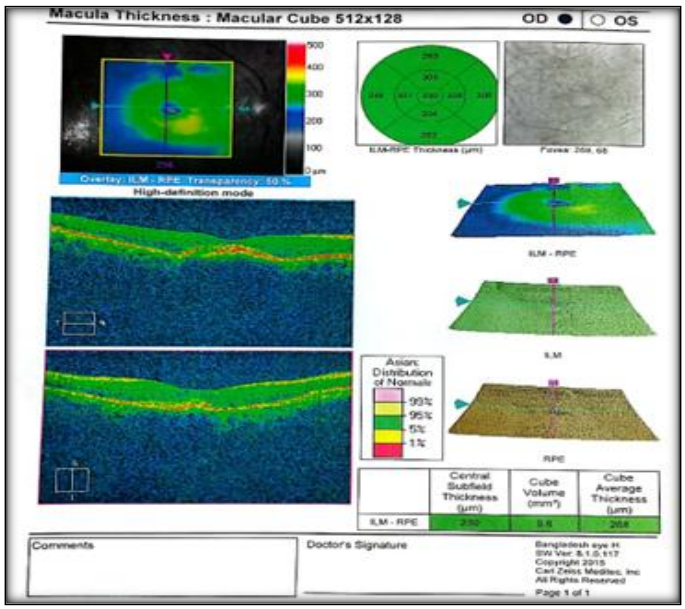

Figure 3: OCT finding of a patient after brolucizumab treatment

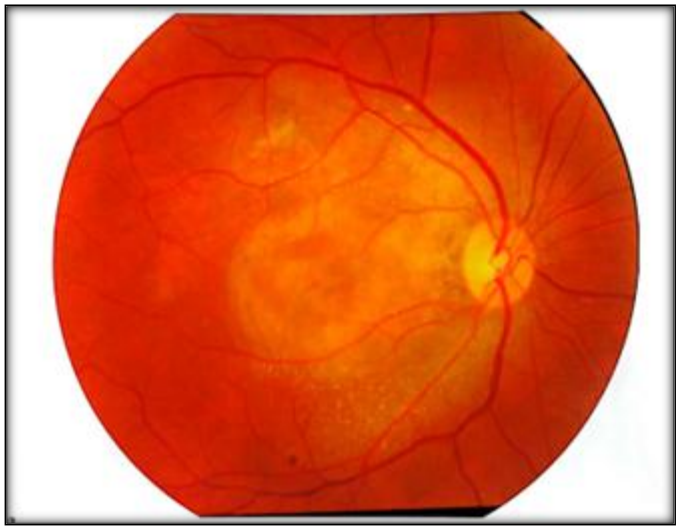

Figure 4: Color fundus of AMD

DISCUSSION

Neovascular AMD (nAMD) accounts for most cases of AMD related severe vision loss.[24] To date, brolucizumab has been only approved by the Food and Drug Administration (FDA) and

Annals of International Medical and Dental Research
E-ISSN: 2395-2822 | P-ISSN: 2395-2814
Vol-9, Issue-3 | May- June 2023
DOI: 10.53339/aimdr.2023.9.3.21
Page no- 168-176 | Section- Research Article (Ophthalmology)

the European Medicines Agency (EMA) for the treatment of nAMD, based on the findings from the HAWK and HARRIER studies.[22,25] The current study was conducted to evaluate the clinical outcome of brolucizumab in the treatment of neovascular age-related macular degeneration. Among 60 patients, the mean age of the patients was 74.3 (SD±9.8) years ranged from 52 to 83 years with a female predominance (51.7%). Sharma A et al,[26] found that among patients with nAMD, mean age was 79.2±7.0 years and 57.2% were females which is similar to our study. Another study of Bulirsch LM et al,[27] also found similar demographic findings where 52.6% were female with a mean (±SD) age of 79.5±6.7 years. In our study, about 38.3% patients had only their right eye affected, 35.0% had only their left eye affected, and 26.7% had both eyes affected. In optical coherence tomography (OCT) findings, we found that a high percentage of patients had subretinal fluid (85%), intraretinal fluid (61.7.%), and sub-RPE fluid (83.3%). In the study of Montesel A et al,[28] among 19 eyes of 19 patients intraretinal fluid was present at baseline in 12 eyes (63%), sub-retinal fluid was present at baseline in 17 eyes (89%). In another study of Bulirsch LM et al,[27] sixty- one eyes (96.8%) of 55 patients presented at baseline with intraretinal and/or subretinal and/or sub- RPE fluid where 7 eyes with subretinal, intraretinal and sub- RPE fluid, 4 eyes with only subretinal and intraretinal fluid, 18 eyes with subretinal and sub- RPE fluid, 6 eyes with intraretinal and sub- RPE fluid, 13 eyes with only subretinal fluid, 12 eyes with only intraretinal fluid, and 1 eyes with only sub-RPE fluid were detected by SD- OCT imaging. In our study, the best-corrected visual acuity (BCVA) at start of the treatment was 0.39±0.29 logMAR and after 12 weeks of treatment was 0.20±0.31 logMAR and this change was statistically significant, as indicated by the P-value of 0.0007. In the study of Sharma A et al,[26] mean BCVA at baseline was 0.42±0.28 LogMAR (20/50) and was 0.36±0.29 (20/50) at the last follow-up, p=0.33, which is in line with our study. But in the study of Montesel A et al,[28] mean baseline best-corrected visual acuity was 0.4 ± 0.4 logMAR and at the last follow-up was 0.4 ± 0.6 logMAR (p= 0.778) indicating a stable BCVA which is not similar to our study. In our study, the central subfield retinal thickness (CSRT), foveal center point (FCP), and Central macular thickness (CMT) parameters showed a statistically significant (P<0.001) improvement after brolucizumab treatment. At baseline CSRT was 417.37±102.47 µm, FCP was 363.32±133.39 µm and CMT was 476±156 µm. At 12th week, CSRT was 328.25±90.50 µm, FCP was 272.80±122.40 µm and CMT was 292±144 µm. The mean values for these parameters decreased after treatment, indicating a reduction in retinal thickness and improved structural outcomes. In the study of Bulirsch LM et al,[27] FCP was 363.32±133.03 (89–826) µm and mean CSRT was 409.43±112.32 (224–784) µm at baseline. At visit 1, mean change in FCP was −66.81±72.63 (−85.1; −48.5) µm and in CSRT −66.76±60.71 (−82.05; −51.47) µm (all: p<0.001). In the study of Montesel A et al,[28] the CMT was 470 ± 151µm (range 235–802) at baseline and 360±144µm (range 203–728) at last the follow-up (p = 0.001, 95% CI = 51.95–168.98, post-hoc statistical power analysis 94.8%). Since the approval of brolucizumab, development of IOI following brolucizumab treatment, with or without moderate and severe visual loss, have been reported.[29,30,31] In our study, 4 patients (6.7%) experienced intraocular inflammation, which is inflammation within the eye, 2 patients

Annals of International Medical and Dental Research
E-ISSN: 2395-2822 | P-ISSN: 2395-2814
Vol-9, Issue-3 | May- June 2023
DOI: 10.53339/aimdr.2023.9.3.21
Page no- 168-176 | Section- Research Article (Ophthalmology)

(3.3%) reported cloudy vision, and 3 patients (5%) experienced eye redness as a complication of the treatment. The majority of the patients, 51 (85%) did not experience any complications from the treatment. Overall, the complication rate using brolucizumab was tolerable. Similar results were found in other studies.[27,32] After treatment, we found that majority had vision improvement (70%) and 30% had no improvement.

Limitations of the study

In our study, there was small sample size and absence of control for comparison. Study population was selected from one center in Dhaka city, so may not represent wider population. The study was conducted at a short period of time. The sampling was retrospective and there was no random allocation, so there is risk of selection bias.

CONCLUSIONS

From the findings of our study, it can be concluded that brolucizumab may be an effective treatment for neovascular age-related macular degeneration (nAMD), as it can improve the best-corrected visual acuity and structural outcomes of the retina such as subfoveal retinal thickness, foveal center point, and central macular thickness. There was also a tolerable complication rate after treatment. Further study with larger sample size and comparison with other treatment option can be done to have better understanding about the effectiveness of brolucizumab for neovascular AMD.

REFERENCES

1. Joussen AM, Bornfeld N. The treatment of wet age-related macular degeneration. Dtsch Arztebl Int. 2009;106(18):312-7. doi: 10.3238/arztebl.2009.0312.
2. Wong WL, Su X, Li X, Cheung CM, Klein R, Cheng CY, et al. Global prevalence of age-related macular degeneration and disease burden projection for 2020 and 2040: a systematic review and meta-analysis. Lancet Glob Health. 2014;2(2):e106-16. doi: 10.1016/S2214-109X(13)70145-1.
3. Nguyen QD, Das A, Do DV, Dugel PU, Gomes A, Holz FG, et al. Brolucizumab: evolution through preclinical and clinical studies and the implications for the management of neovascular age-related macular degeneration. Ophthalmology. 2020;127(7):963-76.
4. Mitchell P, Liew G, Gopinath B, Wong TY. Age-related macular degeneration. Lancet. 2018;392(10153):1147-1159. doi: 10.1016/S0140-6736(18)31550-2.
5. Holz FG, Schmitz-Valckenberg S, Fleckenstein M. Recent developments in the treatment of age-related macular degeneration. J Clin Invest. 2014;124(4):1430-8. doi: 10.1172/JCI71029.
6. Bakri SJ, Thorne JE, Ho AC, Ehlers JP, Schoenberger SD, Yeh S, et al. Safety and Efficacy of Anti-Vascular Endothelial Growth Factor Therapies for Neovascular Age-Related Macular Degeneration: A Report by the American Academy of Ophthalmology. Ophthalmology. 2019;126(1):55-63. doi: 10.1016/j.ophtha.2018.07.028.
7. Ersoz MG, Karacorlu M, Arf S, Sayman Muslubas I, Hocaoglu M. Retinal pigment epithelium tears: Classification, pathogenesis, predictors, and management. Surv Ophthalmol. 2017;62(4):493-505. doi: 10.1016/j.survophthal.2017.03.004.
8. Daniel E, Grunwald JE, Kim BJ, Maguire MG, Jaffe GJ, Toth CA, et al. Comparison of Age-Related Macular Degeneration Treatments Trials Research Group. Visual and morphologic outcomes in eyes with hard exudate in the comparison of age-related macular degeneration treatments trials. Ophthalmol Retina. 2017;1(1):25-33.
9. Wykoff CC, Clark WL, Nielsen JS, Brill JV, Greene LS, Heggen CL. Optimizing Anti-VEGF Treatment Outcomes for Patients with Neovascular Age-Related Macular Degeneration. J Manag Care Spec Pharm. 2018;24(2-a Suppl):S3-S15. doi: 10.18553/jmcp.2018.24.2-a.s3.
10. Kiss S, Malangone-Monaco E, Wilson K, Varker H, Stetsovsky D, Smith D, et al. Real-World Injection

Annals of International Medical and Dental Research
E-ISSN: 2395-2822 | P-ISSN: 2395-2814
Vol-9, Issue-3 | May- June 2023
DOI: 10.53339/aimdr.2023.9.3.21
Page no- 168-176 | Section- Research Article (Ophthalmology)

Frequency and Cost of Ranibizumab and Aflibercept for the Treatment of Neovascular Age-Related Macular Degeneration and Diabetic Macular Edema. J Manag Care Spec Pharm. 2020;26(3):253-266. doi: 10.18553/jmcp.2020.19245.
11. Markham A. Brolucizumab: First Approval. Drugs. 2019;79(18):1997-2000. doi: 10.1007/s40265-019-01231-9.
12. Rahman EZ, Singer MA. Brolucizumab as treatment of wet age-related maculopathy. Drugs Today (Barc). 2020;56(11):699-704. doi: 10.1358/dot.2020.56.11.3199812.
13. Broich K; Committee for Medicinal Products for Human Use. Committee for Medicinal Products for Human Use (CHMP) assessment on efficacy of antidepressants. Eur Neuropsychopharmacol. 2009;19(5):305-8. doi: 10.1016/j.euroneuro.2009.01.012.
14. Avery RL, Castellarin AA, Steinle NC, Dhoot DS, Pieramici DJ, See R, et al. Systemic pharmacokinetics and pharmacodynamics of intravitreal aflibercept, bevacizumab, and ranibizumab. Retina. 2017 Oct;37(10):1847-1858. doi: 10.1097/IAE.0000000000001493.
15. Tietz J, Spohn G, Schmid G, Konrad J, Jampen S, Maurer P, et al. Affinity and potency of RTH258 (ESBA1008), a novel inhibitor of vascular endothelial growth factor a for the treatment of retinal disorders. Investig Ophthalmol Vis Sci. 2015;56(7):1501-.
16. Nguyen QD, Das A, Do DV, Dugel PU, Gomes A, Holz FG, et al. Brolucizumab: evolution through preclinical and clinical studies and the implications for the management of neovascular age-related macular degeneration. Ophthalmology. 2020;127(7):963-76.
17. Sharma A, Kumar N, Kuppermann BD, Bandello F. Brolucizimab-leading an era of structural revolution for long-term VEGF suppression. Eye (Lond). 2020;34(4):611-613. doi: 10.1038/s41433-019-0583-z.
18. Sharma A, Kumar N, Parachuri N, Sharma R, Bandello F, Kuppermann BD, et al. Brolucizumab and immunogenicity. Eye (Lond). 2020;34(10):1726-1728. doi: 10.1038/s41433-020-0853-9.
19. Yannuzzi NA, Freund KB. Brolucizumab: evidence to date in the treatment of neovascular age-related macular degeneration. Clin Ophthalmol. 2019;13:1323-1329. doi: 10.2147/OPTH.S184706.
20. Dugel PU, Koh A, Ogura Y, Jaffe GJ, Schmidt-Erfurth U, Brown DM, et al. HAWK and HARRIER: Phase 3, Multicenter, Randomized, Double-Masked Trials of Brolucizumab for Neovascular Age-Related Macular Degeneration. Ophthalmology. 2020;127(1):72-84. doi: 10.1016/j.ophtha.2019.04.017.
21. Dick AD, Rosenbaum JT, Al-Dhibi HA, Belfort R Jr, Brézin AP, Chee SP, et al. Guidance on Noncorticosteroid Systemic Immunomodulatory Therapy in Noninfectious Uveitis: Fundamentals Of Care for UveitiS (FOCUS) Initiative. Ophthalmology. 2018;125(5):757-773. doi: 10.1016/j.ophtha.2017.11.017.
22. Wang SV, Kulldorff M, Poor S, Rice DS, Banks A, Li N, et al. Screening Medications for Association with Progression to Wet Age-Related Macular Degeneration. Ophthalmology. 2021;128(2):248-255. doi: 10.1016/j.ophtha.2020.08.004.
23. Wang SV, Kulldorff M, Poor S, Rice DS, Banks A, Li N, et al. Screening Medications for Association with Progression to Wet Age-Related Macular Degeneration. Ophthalmology. 2021;128(2):248-255. doi: 10.1016/j.ophtha.2020.08.004.
24. Solomon SD, Lindsley K, Vedula SS, Krzystolik MG, Hawkins BS. Anti-vascular endothelial growth factor for neovascular age-related macular degeneration. Cochrane Database Syst Rev. 2019;3(3):CD005139. doi: 10.1002/14651858.CD005139.pub4.
25. Kilmartin DJ. Literature review and proposal of best practice for ophthalmologists: monitoring of patients following intravitreal brolucizumab therapy. Ir J Med Sci. 2023;192(1):447-456. doi: 10.1007/s11845-022-02929-8.
26. Sharma A, Kumar N, Parachuri N, Sadda SR, Corradetti G, Heier J, et al. Brolucizumab-early real-world experience: BREW study. Eye (Lond). 2021;35(4):1045-1047. doi: 10.1038/s41433-020-1111-x.
27. Bulirsch LM, Saßmannshausen M, Nadal J, Liegl R, Thiele S, Holz FG. Short-term real-world outcomes following intravitreal brolucizumab for neovascular AMD: SHIFT study. Br J Ophthalmol. 2022;106(9):1288-1294. doi: 10.1136/bjophthalmol-2020-318672.
28. Montesel A, Bucolo C, Sallo FB, Eandi CM. Short-Term Efficacy and Safety Outcomes of Brolucizumab in the Real-Life Clinical Practice. Front Pharmacol. 2021;12:720345. doi: 10.3389/fphar.2021.720345.
29. Dugel PU, Singh RP, Koh A, Ogura Y, Weissgerber G, Gedif K, et al. HAWK and HARRIER: Ninety-Six-Week Outcomes from the Phase 3 Trials of

Annals of International Medical and Dental Research
E-ISSN: 2395-2822 | P-ISSN: 2395-2814
Vol-9, Issue-3 | May- June 2023
DOI: 10.53339/aimdr.2023.9.3.21
Page no- 168-176 | Section- Research Article (Ophthalmology)

Brolucizumab for Neovascular Age-Related Macular Degeneration. Ophthalmology. 2021;128(1):89-99. doi: 10.1016/j.ophtha.2020.06.028.
30. Baumal CR, Spaide RF, Vajzovic L, Freund KB, Walter SD, John V, et al. Retinal Vasculitis and Intraocular Inflammation after Intravitreal Injection of Brolucizumab. Ophthalmology. 2020;127(10):1345-1359. doi: 10.1016/j.ophtha.2020.04.017.
31. Sharma A, Kumar N, Parachuri N, Singh S, Bandello F, Kuppermann BD, et al. Brolucizumab-related retinal vasculitis: emerging disconnect between clinical trials and real world. Eye (Lond). 2021;35(5):1292-1294. doi: 10.1038/s41433-020-01227-w.
32. Monés J, Srivastava SK, Jaffe GJ, Tadayoni R, Albini TA, Kaiser PK, et al. Risk of Inflammation, Retinal Vasculitis, and Retinal Occlusion-Related Events with Brolucizumab: Post Hoc Review of HAWK and HARRIER. Ophthalmology. 2021;128(7):1050-1059. doi: 10.1016/j.ophtha.2020.11.011.

Source of Support: Nil, Conflict of Interest: None declare