CORRELATIONS BETWEEN SUBFOVEAL CHOROIDAL THICKNESS, MACULAR THICKNESS, AND VISUAL OUTCOME IN NEOVASCULAR AGE-RELATED MACULAR DEGENERATION USING SWEPT SOURCE OCT: INSIGHTS FROM INTRAVITREAL AFLIBERCEPT TREATMENT

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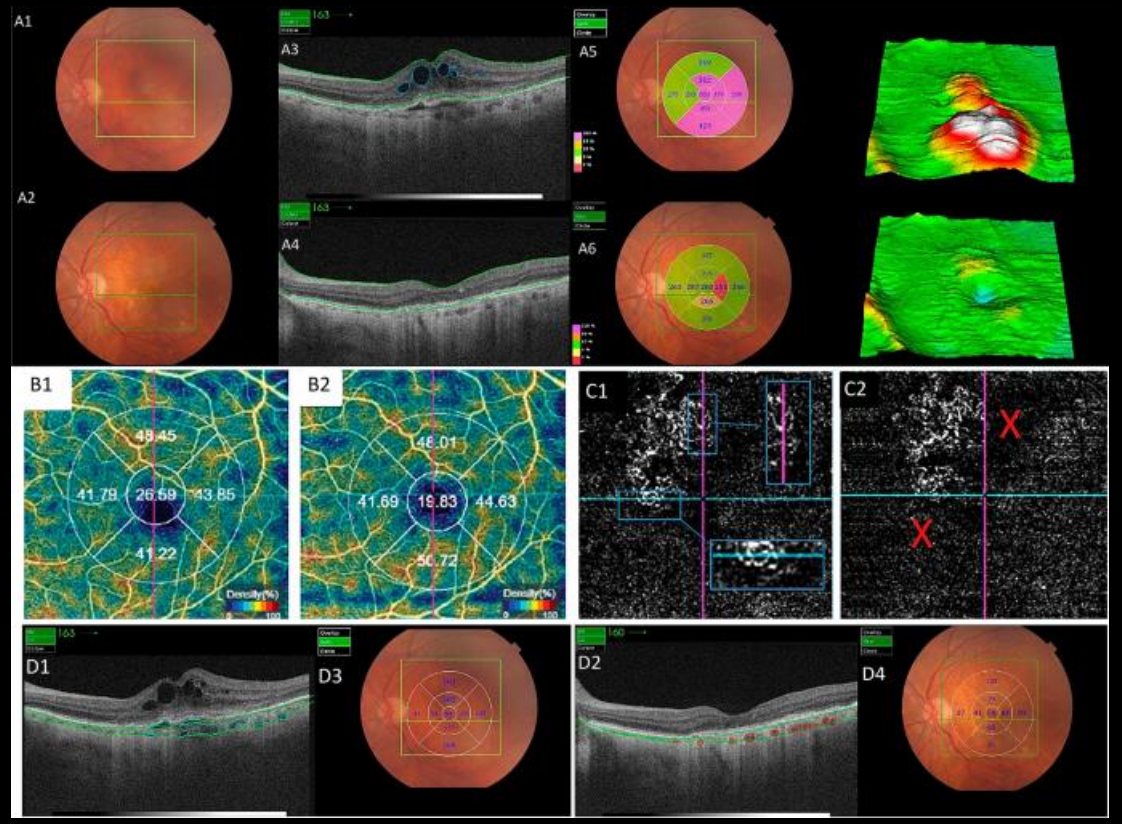
ABSTRACT

- Age-related macular degeneration (AMD) is a leading cause of visual impairment among individuals aged 50 and above, often resulting in irreversible vision loss (1). Currently, antiangiogenic therapy is the primary treatment approach for neovascular AMD (2). The choroid has gained significant attention in recent years due to its involvement in various ocular pathologies (7). The objective of this study was to evaluate visual acuity and correlate pre-treatment variables, such as foveal thickness and choroidal thickness, with post-treatment outcomes.



MATERIALS AND METHODS

- This study was designed as a prospective interventional study to investigate the changes in choroidal and macular thickness in patients with neovascular AMD who received intravitreal aflibercept injections. The study utilized medical records and employed Swept Source Optical Coherence Tomography (OCT-SS) for evaluation. The data was collected from patients during a three-month load dose period.

Description of patients' personal and clinical characteristics

Characteristic	
N (pacients)	15
Age	79.80 ± 7.34 (81)
Gender	
Female	5 (33.33%)
Male	10 (66.67%)
Eye	
Right	8 (53.33%)
Left	7 (46.67%)
Personal background	
Cardiopathy	2 (13.33%)
DM II	3 (20.00%)
SAH	9 (60.00%)
Hypothyroidism	1 (6.67%)
Parkinson	1 (6.67%)
No comorbidities	3 (20.00%)
Phakic/Pseudophakic	
Phakic	2 (13.33%)
Pseudophakic	13 (86.67%)

RESULTS

- Visual Acuity Improvement: Best-corrected mean visual acuity significantly improved from 1.0 logarithm of the minimum resolution angle (logMAR) units to 0.55 logMAR after treatment with aflibercept ($p < 0.001$).
- Macular and Choroidal Thickness Changes: Patients undergoing treatment exhibited a significant decrease in average macular thickness from 323 µm to 232 µm ($p = 0.001$) and a reduction in choroidal thickness from 206 µm to 172 µm ($p = 0.031$) post-treatment.
- Maintenance of Intraocular Pressure: Intraocular pressure was maintained within the normal range ($p = 0.719$) without significant variation during the treatment period.
- Statistical Associations and Correlations: Statistically significant associations were found between the difference in pre- and post-treatment choroidal thickness and the pretreatment values of macular thickness ($p = 0.005$) and choroidal thickness ($p = 0.013$).
- There was also a statistically significant correlation between the difference in pre- and post-treatment macular thickness and the pretreatment macular thickness value ($p < 0.001$).

Description of ocular parameters at each moment of evaluation and result of comparative tests

Characteristic	Pre	Post	Diference	P-value[a]
VA (logMAR)	1.00 ± 0.39 (1.00)	0.55 ± 0.27 (0.48)	− 0.45 ± 0.22 (− 0.40)	0.0006
Macular thickness (µm)	323.40 ± 103.39 (284)	231.60 ± 64.48 (227)	− 91.80 ± 89.46 (− 83)	0.0010
Subfoveal choroidal thickness (µm)	206.33 ± 92.96 (226)	172.00 ± 87.16 (172)	− 34.33 ± 55.45 (− 17)	0.0054
IOP (mmHg)	12.27 ± 0.88 (12)	12.20 ± 0.77 (12)	− 0.07 ± 0.70 (0)	0.9411

[a]P-value for the Wilcoxon signed-rank test. Values less than 0.05 show a statistically significant difference between groups

CONCLUSION

- Found that for every 1-micron increase in pretreatment macular thickness, the pre/post choroidal thickness difference decreased by 0.31 microns.
- Similarly, observed that for every 1-micron increase in pretreatment choroidal thickness, the pre/post choroidal thickness difference decreased by 0.31 microns.
- Established a statistically significant association between pre/post macular thickness differences and pretreatment macular thickness values, with a decrease of 0.68 microns for every 1-micron increase in pretreatment macular thickness.
- In this study, aflibercept exhibited remarkable effectiveness in reducing macular and choroidal thickness, as evaluated using OCT-SS, and significantly improved visual acuity in patients with neovascular AMD. The assessment of both choroidal and macular changes, as well as their correlations, can provide valuable insights for clinicians, enabling them to make well-informed therapeutic decisions and effectively monitor treatment outcomes. Notably, this study contributes to the existing body of literature as the first to establish a correlation between pretreatment foveal thickness, variation in choroidal thickness, and post-treatment choroidal thickness.