



Outcomes of tissue plasminogen activator & C3F8 gas for sub-macular haemorrhage

Analysis of patients treated before and after 14 days post-onset

Ian R. Reekie, William Fusi-Rubiano, Callum Grewal, Hetvi Bhatt, Muhammad Kutubi, Peter Caruana, Nick Price, Hosam Abdalla, Gregory Ho-Yen, Kamaljit Balaggan

Wolverhampton and Midland Counties Eye Infirmary, Royal Wolverhampton NHS Trust, UK

Introduction

Sub-macular haemorrhage (SMH) is a visually devastating condition, most often secondary to a choroidal neovascular membrane from age related macular degeneration. It is estimated that yearly SMH incidence is 4.6/1000 patients with neovascular age related macular degeneration [1]. Tissue plasminogen activator (tPA) can be administered along with intravitreal injection of C3F8 gas to displace the haemorrhage and preserve vision.

We present real world data from a large cohort demonstrating good visual outcomes.

Methods

Patients undergoing intravitreal tPA/C3F8 from April 2015 to August 2024 were identified and case notes retrospectively analysed. Visual acuity (VA) in LogMAR was recorded at presentation, at three months, and at six months following treatment. CF, HM and PL vision were converted to LogMAR following common convention [2]. Other data recorded included patient demographics, underlying cause of haemorrhage concurrent use of antiplatelet or anticoagulant medications, greatest height and area of sub-macular haemorrhage on OCT imaging (Figure 1), and complications of treatment. Change in visual acuity and sub-macular haemorrhage height were compared between timepoints using a repeated measures ANOVA. Subgroup analyses were performed for patients treated <14 days and ≥14 days from onset of bleed.

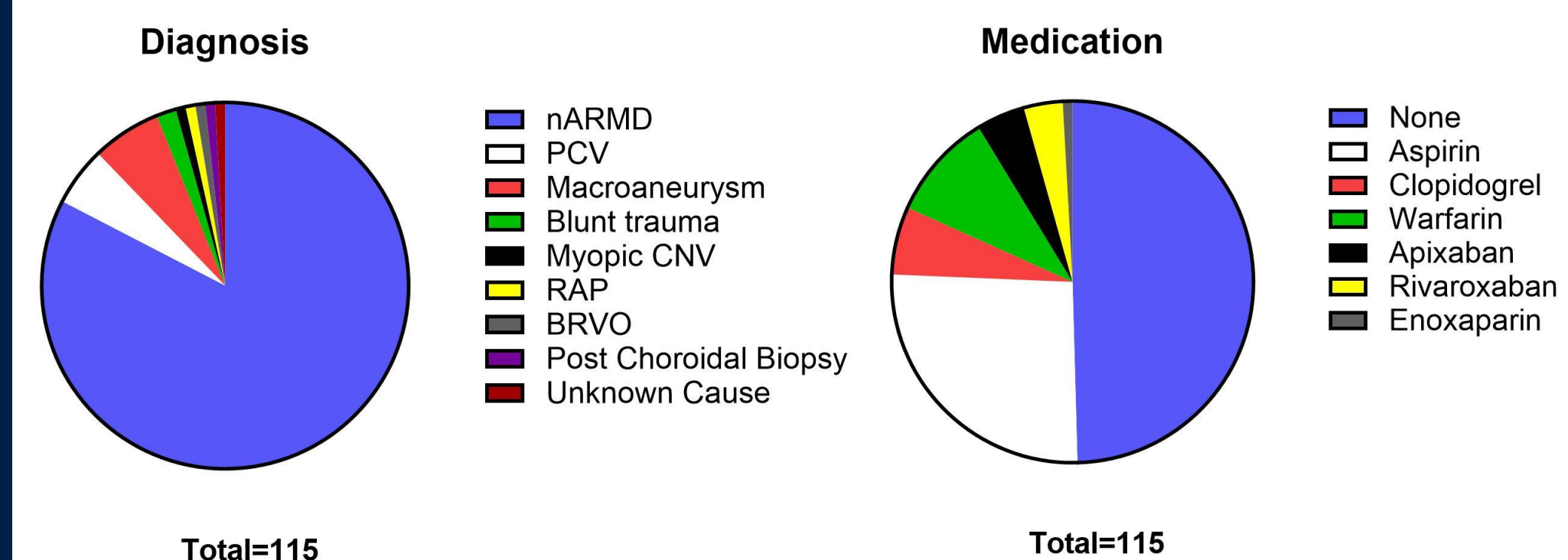


Figure 2: Underlying causes of SMH (left). Antiplatelet and anticoagulant medications used (right).

Results

115 patients (64 female, 51 male) met inclusion criteria. Mean age was 78.7 years (SD 12.8, range 22-100). Mean time from symptom onset to presentation was 6.8 days (SD 8.68, range 0-56, median 3 days) and median time from presentation to treatment was 1 day. 58/115 (50.43%) of patients were on antiplatelet or anticoagulant medications (Figure 2). Underling diagnoses are given in Figure 2.

Mean VA (LogMAR) amongst patients treated <14 days from symptom onset improved from 1.57 to 1.00 at month 3 and 0.99 at month 6 (p<0.001), Mean VA amongst patients treated ≥14 days from symptom showed a non-statistically significant improvement from 1.48 at baseline to 1.27 and 1.32 at month 3 and 6.

Measured haemorrhage height significantly improved over time in both groups (Figure 3). 90.4% of procedures were uncomplicated, the most common complications were acute IOP rise requiring gas release (2.6%) and RPE rip (2.6%).

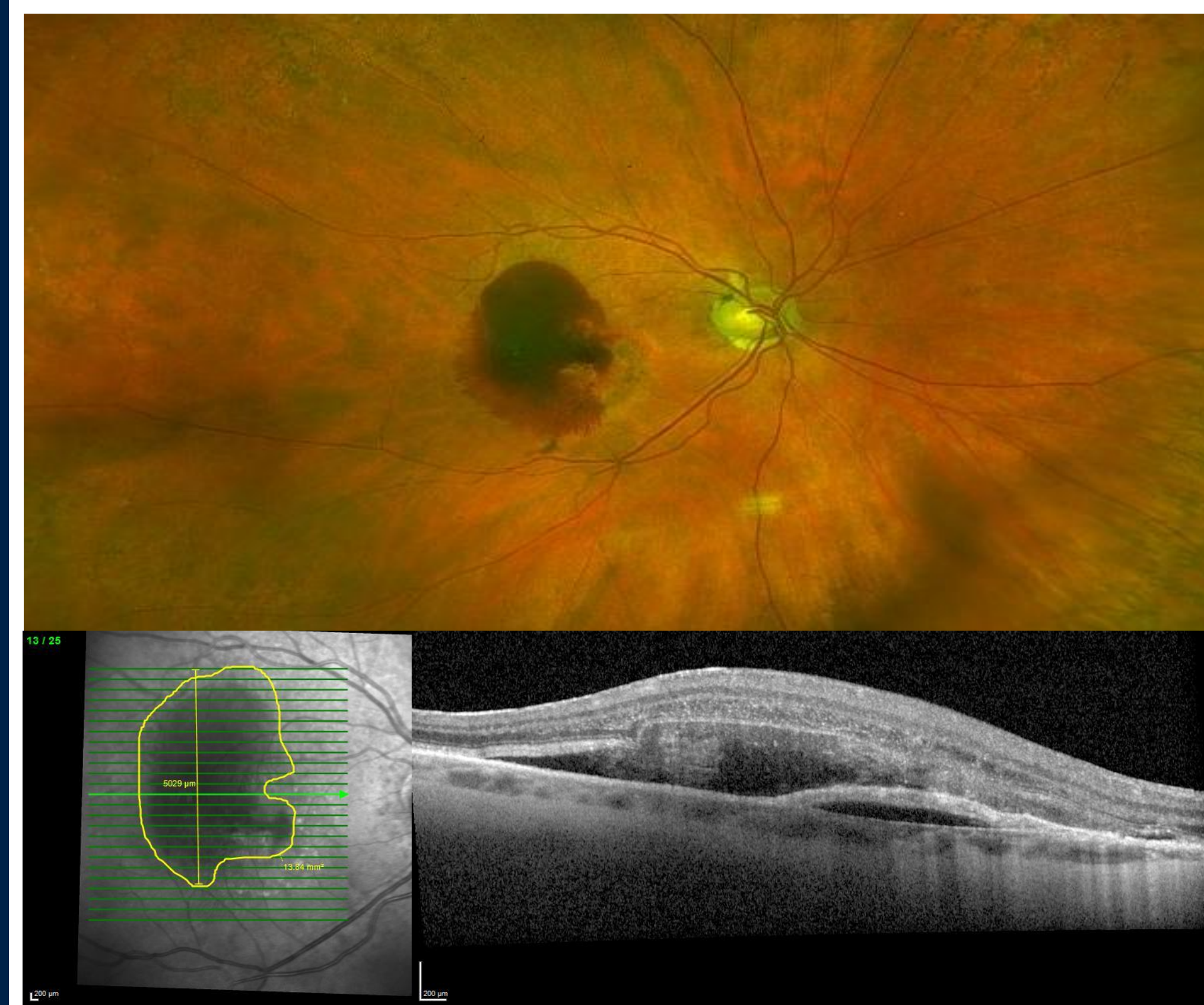


Figure 1: Optos (top) and OCT (bottom) image of a sub macular haemorrhage.

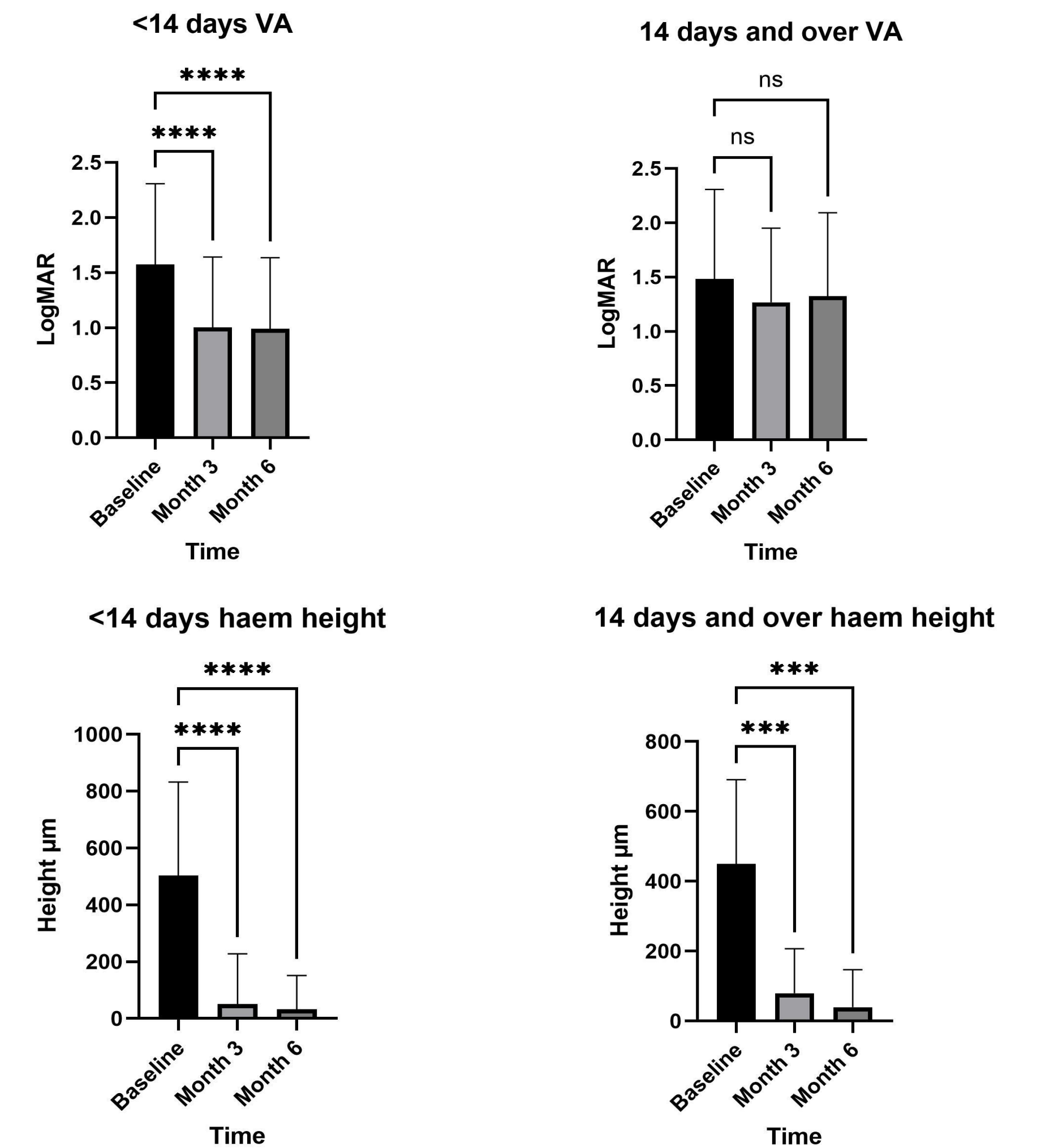


Figure 3: VA significantly improves with treatment within 14 days of symptom onset. **** = p<0.0001, *** = p<0.001, ns= not significant

Discussion

Intravitreal tPA and C3F8 following SMH is effective within 14 days of onset. Although VA did not improve after 14 days of SMH onset, anecdotally many patients perceive benefit, and VA assessment alone may not capture functional utility of treatment. Further work should investigate benefit in terms of visual field and patient reported outcomes.

References

- Gabrielle PH, Maitrais S, Nguyen V, Arnold JJ, Squirrell D, Arnold L, Sanchez-Monroy J, Viola F, O'Toole L, Barthelmes D, Creuzot-Garcher C, Gillies M; Fight Retinal Blindness! Study Group. Incidence, risk factors and outcomes of submacular haemorrhage with loss of vision in neovascular age-related macular degeneration in daily clinical practice: data from the FRB! registry. Acta Ophthalmol. 2022 Dec;100(8):e1569-e1578. doi: 10.1111/aos.15137.
- Donachie PHJ, Sparrow JM, Johnston RL. Year 1 Annual Report-Piloting of the National Ophthalmology Database Audit Methodology, National Ophthalmology Database. 2016.