Are all retinal vein occlusion patients suitable for the treat and extend treatment protocol?

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Introduction

The RCOphth published guidance on retinal vein occlusion (RVO) treatment includes standard treatment for macular oedema (MO) with approved anti-vascular endothelial growth factor agents (anti-VEGFs) or dexamethasone implant and application of retinal laser reserved for development of retinal neovascularisation from recognised severe retinal ischaemia only.

However, in recent years, the anti-VEGF treat and extend (T&E) regimen has been rapidly and widely adopted for patients with many macular/retinal diseases as a way to deal with high service demands

Our local RVO treatment protocol focuses on eliminating retinal ischaemia, starting with anti-VEGFs loading phase, applied Fluorescein angiogram (FFA) thereafter to guide retinal laser need for every RVO patient. Dexamethasone implant is offered as second-line treatment, reserved for chronic MO without ischaemia (or treated ischaemia).

Although RVO shares the complication of MO with age-related macular degeneration, the former has the potential risks of blindness from vitreous haemorrhage/rubeotic glaucoma (NVG) from rapid retinal neovascularisation.

Therefore, we hypothesise that the T&E regimen based on mainly OCT results (managed by allied professionals) may not be suitable for all RVO patients, as it risks missing detection of severe retinal ischaemia-related complications, and potential unnecessary "over-injections"

Purpose

To study RVO treatment outcomes in our cohort and identify subgroup suitability (chronic MO with no retinal ischaemia) for T&E regimen.

Materials and Methods

Retrospective single-centre data collection/analysis on all RVO patients started first anti-VEGF loading dose in 1 year (2021). Follow-up data for 3 years including visual acuity (VA), frequency of treatment (injections/lasers), complications and discharge rate.

Local RVO treatment protocol:

1. Loading dose of 3 anti-VEGF injections
2. Systemic risk factors (BP, blood results) are assessed at post-loading phase and fundus fluorescein angiography to assess retinal laser need
3. Re-injections are based on significant cmo recurrence

Results

Our cohort included 200 eyes (197 patients): 48% BRVO, 9% HRVO, 43% CRVO (12.8% NVG). Mean age was 70.4 years (SD12.95years, range 28–96years), 55.8% males; 61.5% Caucasian, 20% Asian and 11% African/Afro-Caribbean.

Visual acuity

- 103 eyes (51.5%) presented with a VA of 6/15 – 6/48 and 52.4% of these had BRVO.
- Post-treatment, best VA level (6/12 or better) was highest at the end of years one and three at 38% and 37.2% respectively.
- 29 – 46% of patients had improved VA each year, with 38 – 53% remaining stable.

Results

Visual acuity (cont'd)

- 50% of patients presenting with VA of CF or worse experienced improvement each year.

Injection numbers and frequency

- In year one, 978 anti-VEGF injections were given to 200 eyes [mean 4.85 injections/eye (SD: 2.17, range 1 – 12)]. In year two, injection frequency decreased by 42.3%: mean 2.05 injections/eye (SD: 2.17, range 1 – 8) and decreased further in year 3: mean 1.60 injections/eye (SD: 2.12, range 1 – 9).
- Only 8/200 (4%) of eyes received 12 dexamethasone implants over the study period [mean 1.5 implants/eye (SD 0.87, range 1 – 3)]. 87.5%had CRVO, 12.5% had BRVO.
- Frequent injections (defined as chronic MO, needing ≥5 injections/year after first year loading phase) were needed in 31 eyes (15.5%): 58% had CRVO; 48.4% presented with a VA of 6/15 – 6/48.

Laser and ischaemia

- 109 eyes (54.5%) had FFA proven retinal ischaemia, and 126 eyes (63%) had retinal laser.

Treatment complications and outcome

- Complications: 8.3% developed glaucoma post-Ozurdex, 1.0% had post-injection IOP rise, 0% had endophthalmitis, cataract or uveitis

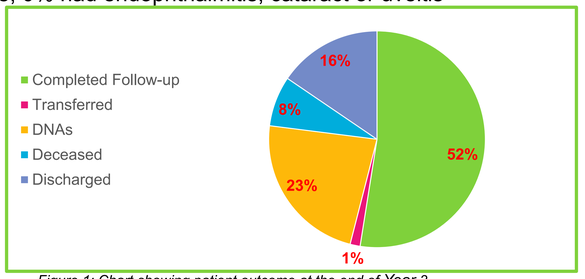

Figure 1: Chart showing patient outcome at the end of Year 3

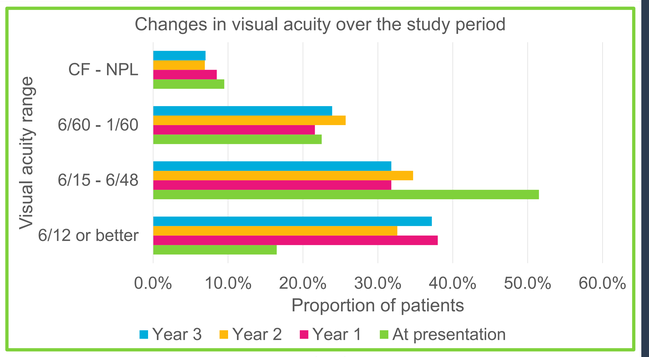

Figure 2: Chart showing changes in visual acuity over the study period

Patients with no CMO recurrence	Patients with persisting CMO	What would it look like in our cohort?
7 injections/year	12 injections/year as no interval extension	•200 eyes: 15% had chronic CMO needing on-going injections •Average eye in our cohort [85% (170 eyes)] needed: •5 injections/year 1; •2 injections/year 2; •1.5 injections/year 3
keep extending every 2 weeks if no CMO, stop injecting if still dry after 12-week interval extension	one-stop injection clinic to have OCT, decision to treat and extend based on CMO only, ischemic features not included	current protocol (Yr1) injections number = 170 x 5 inj = 850 inj **Vs** T&E protocol (Yr1) injections number = 170 x 7 inj = 1190 inj T&E protocol over-inject 340 eyes in Yr1. T&E protocol over-inject 850 eyes in Yr2.

Table1: Projection of application of T&E regimen to our cohort

Conclusion

Based on our local RVO treatment protocol, our cohort recorded comparatively low injections needed each year when the majority received retinal laser. Visual improvement/stability continued in each treatment year with a very low complication rate. Our cohort identified only 15.5% belonged to chronic MO group requiring frequent injections. We therefore recognised that suitability for T&E regimen is limited to a relatively small group of RVO patients with MO. Generalised T&E application for all RVO patients was projected to result in over-injections of 340 in Year 1 and 850 in Year 2.