Meta-analysis of the effect of intravitreal bevacizumab versus intravitreal triamcinolone acetonide in central retinal vein occlusion

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CRD summary
This review found a similar improvement in best-corrected visual acuity and central macular thickness among patients with central retinal vein occlusion (eye blood vessel blockage) after intravitreal injections with bevacizumab or triamcinolone acetonide. The reliability of the authors’ conclusions is limited by the lack of reporting of included study quality, small sample sizes, and inclusion of mainly non-randomised studies.

Authors’ objectives
To evaluate the effect of intravitreal bevacizumab for the treatment of central retinal vein occlusion.

Searching
PubMed, EMBASE and Cochrane Central Register of Controlled Trials (CENTRAL) were searched up to January 2013 for published articles with no language restrictions. Search terms were reported. Reference lists and bibliographies of relevant articles were also searched.

Study selection
High-quality studies that compared intravitreal bevacizumab versus intravitreal triamcinolone acetonide for central retinal vein occlusion were eligible for inclusion. To be included studies had to measure and record pre- and post-treatment visual acuity and macular thickness. The outcomes of interest were best-corrected visual acuity and central macular thickness.

The included studies were conducted in Asia and Europe. The mean age of patients who received intravitreal bevacizumab ranged from 55 to 69 years. The dosage of intravitreal bevacizumab ranged from 1.25mg to 1.5mg; dosage of intravitreal triamcinolone acetonide ranged from 4mg to 8mg.

Two reviewers independently selected studies for inclusion.

Assessment of study quality
Study quality was assessed using the modified Jadad scale of random allocation, blinding, drop-outs and withdrawals. Two reviewers independently assessed study quality.

Data extraction
Data were extracted to calculate mean differences with their 95% confidence intervals for best-corrected visual acuity and central macular thickness, and relative risks for the incidence of adverse events (such as ocular hypertension).

Two reviewers independently extracted data; disagreements were resolved by discussion.

Methods of synthesis
Pooled weighted mean differences and risk ratios with their 95% confidence intervals were calculated using a random-effects model. Heterogeneity was assessed using the Q test and $I^2$; $I^2$ value of 25% was considered as low heterogeneity, 50% as moderate and 75% as high. Publication bias was assessed with funnel plot.

Results of the review
Five studies were included in the meta-analysis, comprising one randomised controlled trial (RCT) and four non-randomised controlled studies. Study sample sizes ranged from 18 to 72 patients, with 92 eyes in the intravitreal bevacizumab group and 103 eyes in the intravitreal triamcinolone acetonide group. Mean follow-up duration ranged from nine to 12 months.

There was no significant difference between intravitreal bevacizumab or intravitreal triamcinolone acetonide for best-
corrected visual acuity and central macular thickness at four, 12 and 24 weeks. There was no evidence of heterogeneity for all best-corrected visual acuity outcomes and moderate to high heterogeneity for central macular thickness outcomes at 12 and 24 weeks.

There was a statistical significant rise of intraocular pressure with intravitreal triamcinolone acetonide compared with intravitreal bevacizumab (RR 0.06, 95% CI 0.02 to 0.22; I²=0%).

There was no evidence of publication bias.

**Authors' conclusions**
The results showed a similar improvement in best-corrected visual acuity and central macular thickness after intravitreal injections with bevacizumab or triamcinolone acetonide among patients with central retinal vein occlusion. However, the rate of intraocular pressure was significantly higher in the intravitreal triamcinolone acetonide group.

**CRD commentary**
The review question and inclusion criteria were clear. Efforts were made to find published studies but unpublished studies were not sought. No evidence of publication bias was found, but funnel plots for less than 10 studies are not very meaningful, so publication bias could not be fully ruled out. No language restrictions were applied, which reduced potential language bias. Attempts were made to minimise reviewer errors and bias in the review process.

The authors reported that the study quality was assessed but full results were not reported, so the quality of the studies were unknown. Appropriate methods were used to pool data and assess heterogeneity.

Although the authors' conclusions reflected the available evidence, the reliability of their conclusions is limited due to the lack of reported quality assessment, small sample sizes, and inclusion of mainly non-randomised studies.

**Implications of the review for practice and research**
The authors did not state any implications for practice or research.

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