Treat and extend regimen of anti-VEGF agents for diabetic macular edema and macular edema secondary to retinal vein occlusion: a meta-analysis

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Purpose

- Treat-and-extend treatment regimens are commonly used for the treatment of neovascular age-related macular degeneration.
- The safety and efficacy of this regimen relative to others for diabetic macular edema (DME) and macular edema (ME) secondary to retinal vein occlusion (RVO) remains poorly understood.
- This meta-analysis evaluates the comparative safety and efficacy of a treat-and-extend regimen relative to monthly and pro re nata (PRN) regimens using anti-vascular endothelial growth factor (VEGF) agents for DME and ME secondary to RVO.

Methods

- A systematic literature search was conducted on Ovid MEDLINE, EMBASE, and Cochrane Library from inception to December 2021.
- Comparative studies evaluating the efficacy and safety of a treat-and-extend regimen relative to a monthly or PRN regimen with anti-VEGF therapy for DME or ME secondary to RVO were included.
- Other treatment modalities, non-comparative studies, and non-English studies were excluded.
- Cochrane's risk of bias tool 2 and ROBINS-I were used to assess risk of bias and GRADE evaluation was conducted to assess certainty of evidence.
- A random effects meta-analysis was conducted.

Results

- Seven studies of 984 eyes were included in this analysis.
- Relative to a monthly regimen, treat-and-extend was not significantly different for the change in BCVA from baseline to 12 months (p=0.74), 24 months (p=0.39), and final follow-up (p=0.59).
- There was a lower mean number of injections (WMD=-1.54, 95% CI=[-2.01, -1.06], p<0.00001) compared to a monthly regimen.
- Relative to a PRN regimen, treat-and-extend was not significantly different for final BCVA or change in BCVA from baseline to 12 months (p=0.15; p=0.85), 24 months (p=0.69; p=0.78) and final follow-up (p=0.34; p=0.84), and was associated with a higher mean number of injections (WMD=4.74, 95% CI=[0.83, 8.65], p=0.02).
- There was no difference for safety outcomes between treat-and-extend and monthly or PRN regimens.
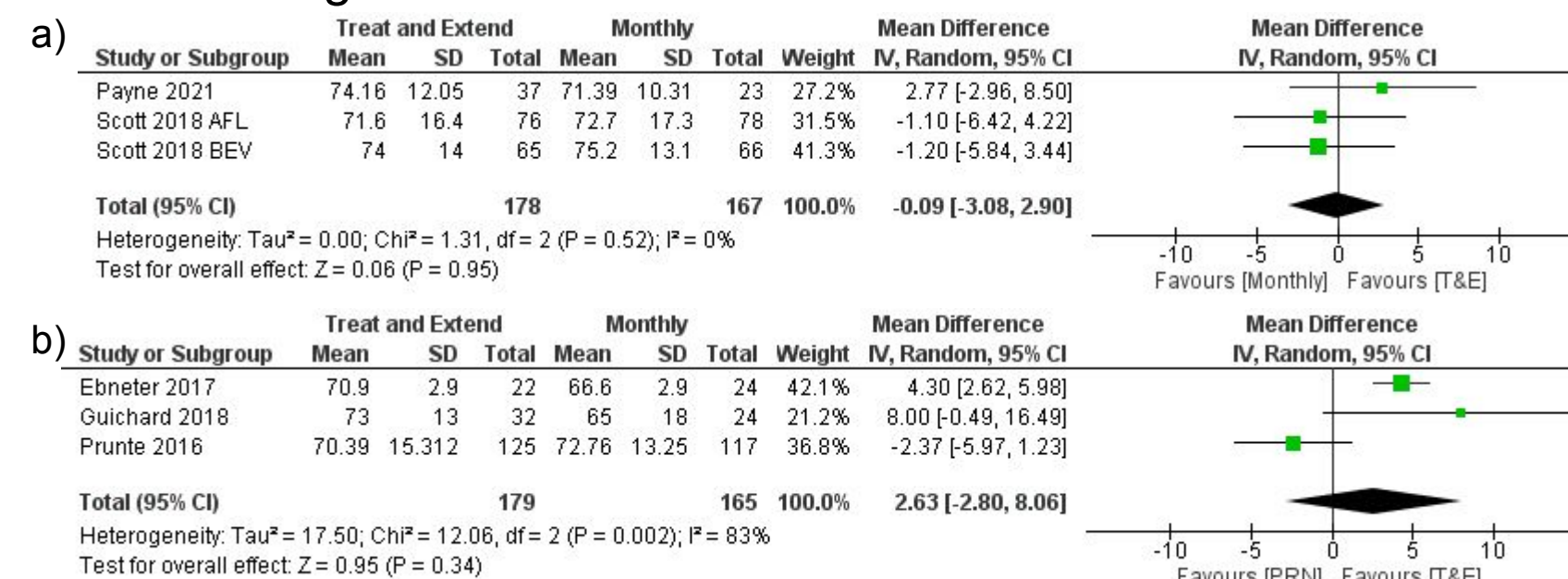

Figure 1. BCVA at final follow-up for treat-and-extend compared to a) monthly and b) PRN regimens.
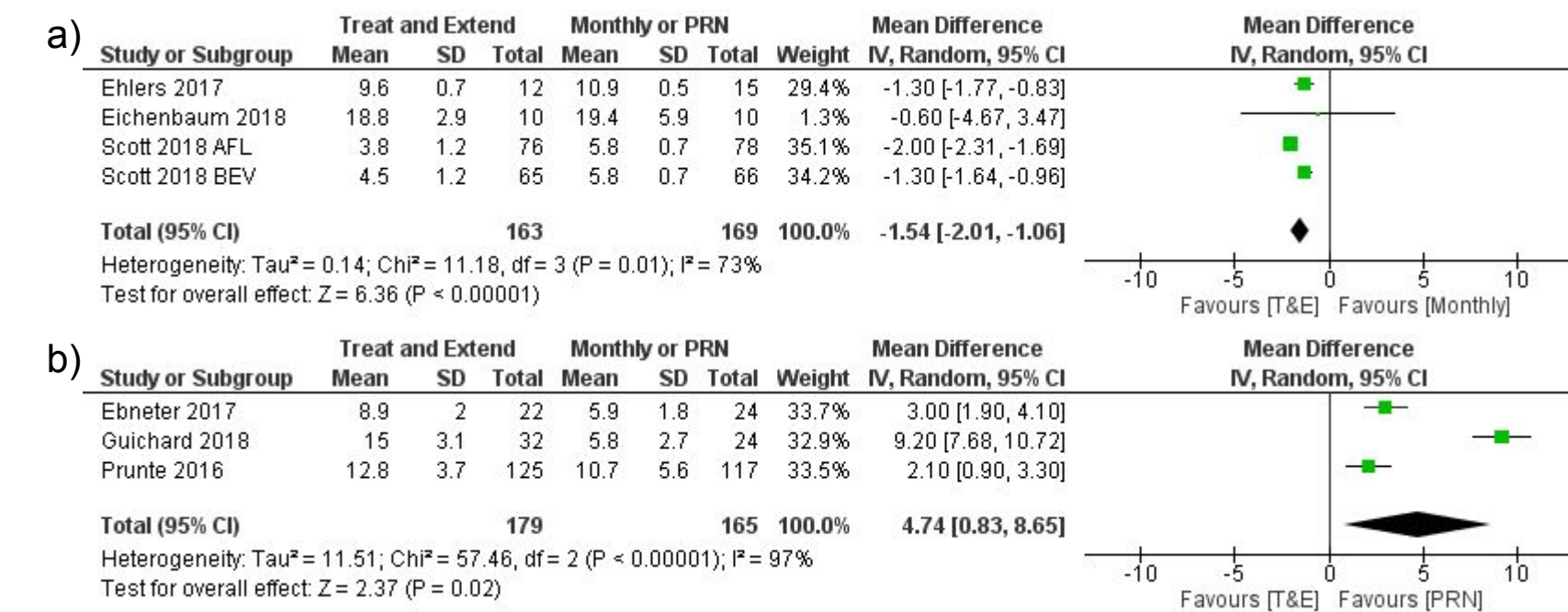

Figure 2. Number of injections for treat-and-extend compared to a) monthly and b) PRN regimens.

Discussion

- This meta-analysis found that a treat-and extend regimen was non-inferior to monthly and PRN treatment regimens in efficacy and safety endpoints for the management of DME or ME secondary to RVO.
- There was a significantly greater injection frequency of a treat-and-extend regimen relative to a PRN protocol, and significantly lesser injection frequency relative to a monthly regimen.
- Overall, there is a paucity of literature in this domain and further investigation is warranted.

Conflicts of Interest

N.P: None Declared, P.N: None Declared, A.D: None Declared, M.P: PSI Foundation, R.M: Bayer, Novartis, P.K: Bayer, Roche, Novartis, ArcticDx