New Concepts in the Management of Retinal Vein Occlusions

Abbreviations: PGIMER: Post Graduate Institute of Medical Education and Research; CRVO: Central Retinal Vein Occlusion; BRVO: Branched Retinal Vein Occlusion; VEGF: Vascular Endothelial Growth Factor; US-FDA: US Food and Drug Administration

Opinion

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The two major types of retinal vein occlusion are branched retinal vein occlusion (BRVO) and central retinal vein occlusion (CRVO). Five-year incidence of BRVO is 0.6% and CRVO is 0.2% [1]. Macular edema secondary to retinal vein occlusions is an important cause of vision loss. The management of RVO has been revolutionised ever since the introduction of intravitreal pharmacotherapy including the use of anti-vascular endothelial growth factor (VEGF) agents. Recently, anti-VEGFs and corticosteroids have been found to be safe and efficacious in the management of retinal vein occlusions.

Anti-VEGF therapy: Newer advances

Retinal vein occlusion leads to increased expression of VEGF in the ocular milieu which is responsible for retinal neovascularisation and increase in retinal vascular permeability. This results in breakdown of the blood-retinal-barrier and subsequent development of macular edema. All three currently available anti-VEGF agents (ranibizumab, bevacizumab and aflibercept) have been successfully used in management of macular edema secondary to retinal vein occlusions. The CRUISE and BRVO studies compared two different doses of ranibizumab (0.3mg versus 0.5mg) to sham injections in patients with macular edema secondary to retinal vein occlusions and showed significant improvement in visual acuity in treated group versus the control group [2,3]. This led to the US Food and Drug Administration (US-FDA) approval of ranibizumab (0.3mg) for the treatment of macular edema secondary to retinal vein occlusions in 2010. In the VIBRANT trial, monthly intravitreal aflibercept injections provided significantly greater visual benefit compared with macular grid laser in eyes with macular edema secondary to BRVO [4]. Aflibercept was approved for the management of macular edema following CRVO in September 2012. Thus, introduction of anti-VEGF agents has been considered as the beginning of a new era in the treatment of macular edema secondary to retinal vein occlusions as these agents target the disease at the molecular level.

Corticosteroids: Current role

Corticosteroids have a role in the treatment of macular edema secondary to retinal vein occlusions because of their anti-inflammatory and anti-angiogenic properties. There has been an interest in the use of local corticosteroid therapy in the management of both BRVO and CRVO. The SCORE study compared two different doses of intravitreal triamcinolone (1mg and 4mg) to the standard of scare which is observation in CRVO and macular laser treatment in BRVO. SCORE-CRVO study concluded that patients in corticosteroid group are five times more likely to have substantial visual gain in visual acuity as compared to observation group. The SCORE-BRVO study concluded that corticosteroid and macular laser treatment has similar impact on vision [5,6]. The GENEVA study evaluated the use of sustained-release dexamethasone implant in the management of macular edema due to retinal vein occlusions [7]. Based on the results of the GENEVA trial, intravitreal dexamethasone implant (OZURDEX®) received FDA approval for the treatment of macular edema secondary to retinal vein occlusions in 2009.

Future Directions

Recently, a number of trials have been initiated with an attempt to reduce the treatment burden by employing a combination of the available therapies. In the recently published WAVE trial, ultra-wide field fluorescein angiography was performed among patients with retinal vein occlusions. The study evaluated the use of wide field image-guided peripheral retinal photocoagulation (of the targeted non-perfused retina) combined with ranibizumab. However, the results of the study did not show any significant reduction in the total number of intravitreal injections required over a period of 12 months [8]. Similarly, the RELATE trial evaluated higher dose of ranibizumab (2.0mg) and laser therapy in the management of macular edema in retinal vein occlusions. The results showed that higher dose of ranibizumab and laser therapy offered no additional benefits in eyes with retinal vein occlusions [9]. A number of newer agents are being studied for the management of retinal vein occlusions. A sustained release implant, IBI-20089 is a novel drug product based on Verisome drug delivery platform technology with different doses of

triamcinolone. It is being evaluated for its role in patients with chronic cystoid edema due to retinal vein occlusions [10]. As there is progressive visual impairment due to degeneration of photoreceptors in eyes with retinal vein occlusions, stem cell therapy is currently being investigated for the treatment of macular edema in BRVO and CRVO [11].

References

1. Klein R, Klein BE, Moss SE, Meuer SM (2000) The epidemiology of retinal vein occlusion: the Beaver Dam Eye Study. Trans Am Ophthalmol Soc 98: 133-141.
2. Brown DM, Campochiaro PA, Singh RP, Li Z, Gray S, et al (2010) Ranibizumab for macular edema following central retinal vein occlusion: six-month primary end point results of a phase III study. Ophthalmology 117(6): 1124-1133.
3. Campochiaro PA, Heier JS, Feiner L, Gray S, Saroj N, et al. (2010) BRAVO Investigators. Ranibizumab for macular edema following branch retinal vein occlusion: six-month primary end point results of a phase III study. Ophthalmology 117(6): 1102-1112.
4. Campochiaro PA, Clark WL, Boyer DS, Heier JS, Brown DM, et al. (2015) Intravitreal aflibercept for macular edema following branch retinal vein occlusion: the 24-week results of the VIBRANT study. Ophthalmology 122(3): 538-544.
5. Scott IU, Ip MS, VanVeldhuisen PC, Oden NL, Blodi BA, et al. (2009) A randomized trial comparing the efficacy and safety of intravitreal triamcinolone with standard care to treat vision loss associated with macular edema secondary to branch retinal vein occlusion. Arch Ophthalmol 127(9): 1115-1128.
6. Ip MS, Scott IU, VanVeldhuisen PC, Oden NL, Blodi BA, et al. (2009) A randomized trial comparing the efficacy and safety of intravitreal triamcinolone with observation to treat vision loss associated with macular edema secondary to central retinal vein occlusion. Arch Ophthalmol 127(9): 1101-1114.
7. Haller JA, Bandello F, Belfort R, Blumenkranz MS, Gillies M, et al. (2010) Randomized, sham-controlled trial of dexamethasone intravitreal implant in patients with macular edema due to retinal vein occlusion. Ophthalmology 117(6): 1134-1146.
8. Wykoff CC, Ou WC, Wang R, Brown DM, Cone C, et al. (2017) Peripheral Laser for Recalcitrant Macular Edema Owing to Retinal Vein Occlusion: The WAVE Trial. Ophthalmology S0161-6420(17)30138-0.
9. Campochiaro PA, Hafiz G, Mir TA, Scott AW, Solomon S, et al. (2015) Scatter Photocoagulation Does Not Reduce Macular Edema or Treatment Burden in Patients with Retinal Vein Occlusion: The RELATE Trial. Ophthalmology 122(7): 1426-1437.
10. Fung AE (2010) A novel sustained-release intravitreal drug delivery system for retinal vascular disease. Retina Today 5: 51-53.
11. Clinical trial of autologous intravitreal bone-marrow CD34+ stem cells for retinopathy.

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