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OPHTHALMOLOGY
Opinion

Opinion on the Retinal Vein Occlusion Management

Marianne Shahsuvaryan*

Department of Ophthalmology, Yerevan State Medical University, Republic of Armenia

***Corresponding Author:** Prof. Marianne Shahsuvaryan, MD, PhD, DSc, Department of Ophthalmology, Yerevan State Medical University, 7 Ap., 26 Sayat-Nova Avenue, Yerevan, 0001, Republic of Armenia.

Received: December 11, 2015; **Published:** December 17, 2015

Retinal vein occlusion (RVO) as a vaso-oclusive disorder of the retinal vein is the most common visually disabling disease affecting the retina after diabetic retinopathy in which arterial risk factors are much more relevant than venous factors, and is a major cause of vision loss and even blindness. In a recent analysis of pooled data from population studies worldwide, the overall RVO prevalence was 0.52% (0.44% branch retinal vein occlusion (BRVO), 0.08% central retinal vein occlusion (CRVO)), translating to approximately 16 million individuals worldwide affected by RVO. Vaso-oclusive disorder of the retinal vein has the potential for significant vision-related morbidity.

Despite being recognized in the 19th century there are still gaps in understanding the etiology and pathogenesis of vaso-oclusive disorders of the central retinal vein and its branches, which leads to in proper management.

Until fairly recently, there was little that could be done for a patient that developed RVO. The standard care was grid laser photocoagulation for macular edema (ME) in non-ischemic BRVO and observation in the case of CRVO.

Currently intravitreal steroid implants and anti-VEGF therapies have transformed the treatment of macular edema following retinal vein occlusion, representing milestone improvements in treatment. Today, implantable and injectable drug-based options are available, notably a Dexamethasone intravitreal implant (Allergan's Ozurdex) and inhibitors of vascular endothelial growth factor (VEGF), including an antibody (Genentech's Lucentis [ranibizumab]) and a fusion protein (Bayer/Regeneron's Eylea [aflibercept]). But there is, however, still room for an improvement taken into account the raising questions and concerns following intravitreal procedures, starting from procedure- related (endophthalmitis, Rhegmatogenous retinal detachments, iatrogenic traumatic cataracts, vitreous hemorrhage) following by chemical compounds- related ocular (optic disc vascular disorder, and retinal vascular disorder, cataract, and tolerance and tachyphylaxis developing over a longer time-period) and systemic (cardiovascular side effects-atrial fibrillation and peripheral edema , arterial thromboembolic events- myocardial infarction, vascular death, renal failure), and ended by economic and cost-effectiveness considerations. The implant procedures and intravitreal injections has led to substantial increases in clinical workload , including repeated implants and multiple anti VEGF injections and follow-up appointments, causing further exacerbate pressure on clinic capacity in the hospital eye service. Aforementioned and currently available long-term results indicate a need for search and development of new multi target cost-effective friendly used drugs with noninvasive delivery methods and good safety profile in providing RVO patients the best care possible.

Today, there is also a focus on improving the retinal bioavailability, which is hampered by the blood-retina barrier. Nanoparticle formulations combined with new delivery systems promise increased drug penetration at the target site, reduced dose required to achieve therapeutic effects, prolonged effects and reductions in toxicity and systemic side-effects. Patient's friendly used route could be gel drops. Taken into account that pathogenesis of RVO is multi factorial and presented by the cascade of biochemical events with both local factors and systemic diseases being etiologically important, the treatment will be directed towards normalization the rheologic factors, resorbtion of blood clot in the occluded vein with restoration of blood circulation, reducing vascular hyperpermeability and macular edema, neuroprotecting the retina, activating of retinal oxygen metabolism, and preventing ischemic processes with consequent

neovascularization. Based on our current knowledge about RVO, the ideal drug will fulfill following criteria: to be a substance that possesses neuroprotective and vasoprotective characteristics, and at the same time have to have a fairly neutral effect on a patient's quality of life. Currently available findings obviate the therapeutic potential of minocycline-semisynthetic second-generation tetracycline antibiotic with a broad-spectrum antibiotic activity, which has also neuroprotective, anti-inflammatory and antioxydative effects and is under investigation. The other way to ameliorate the RVO patients outcomes is to raise awareness about retinal vein occlusion in patients with cardiovascular risk profile, specifically systemic hypertension and motivate them for early examination by ophthalmologist, since delay of therapy diminish its efficacy.

There is a huge amount of effort being made to help us understand vaso-oclusive disorder of the retina and hopefully new drugs are bringing us ever closer to the management of retinal vein occlusion.

Volume 1 Issue S1 December 2015