Arquivos Brasileiros de
Oftalmologia

Retinal venous occlusive disease requiring multifunctional drug therapy

Doença oclusiva venosa da retina que requer terapia medicamentosa multifuncional

Marianne Shahsuvaryan[1]

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

Dear Editor,

Cases of retinal venous occlusive disease are growing exponentially among aging populations, representing increased medical and economic burdens. Retinal vein occlusion (RVO) management poses challenges because of the incompletely understood pathogenesis despite it having been described in the 19th century. The pathogenesis of retinal venous occlusive disease is multifactorial and includes a cascade of biochemical events resulting in occlusion, with initial panvascular alterations and simultaneous decreased blood flow speeds in arterioles and venules[1], microvascular dysfunction with ameliorated parafoveal capillary nonperfusion, diminished parafoveal vascular density in superficial and deep vascular plexuses, and foveal avascular zone enlargement[2].

In addition, the enzyme heparanase seems to play a critical role in the vessel wall molecular pathophysiology[3].

Tissue hypoxia caused by venous obstruction is the most common driver of vascular endothelial growth factor (VEGF) synthesis, and intravitreal injections of anti-VEGF agents have become common. However, this pharmacotherapy intended to suppress just one chemical substance is inadequate to successfully treat retinal venous occlusive disease[4]. Understandably, one concern is the low adherence of the patients to the treatment with monthly intravitreal injections that are critical for its success and to prevent visual acuity deterioration and even blindness. Additional concerns include the high anti-VEGF cost and the visit burden to patients.

These challenges underscore the need for a multidimensional pharmacotherapy approach to restore circulation into the artery and the occluded vein, ameliorating oxidative stress, augmenting neuroprotection, and attenuating inflammation. These goals will be achieved by bridging the gaps in the scientific knowledge on retinal venous occlusive disease and will result in a multitarget, synergistic, noninvasive, and patient-friendly therapeutic intervention (possibly with an ideal agent having multimodal activity). Squalamine is currently undergoing clinical testing as co-therapy by topical mode[5], but may also be tested as a monotherapy.

As professionals become more familiar with the pathophysiological mechanisms in retinal venous occlusive disease, they will begin to consider using multidimensional pharmacotherapies.

REFERENCES

1. CampagnoliTR, Somfai GM, Tian J, DeBuc DC, Smiddy WE. Noninvasive, high-resolution functional macular imaging in subjects with retinal vein occlusion. Ophthalmic Surg Lasers Imaging Retina. 2017;48(10):799-809.doi:10.3928/23258160-20170928-04.
2. Kang JW, Yoo R, Jo YH, Kim HC. Correlation of microvascular structures on optical coherence tomography angiography with visual acuity in retinal vein occlusion. Retina. 2017;37(9):1700-9. doi: 10.1097/IAE.0000000000001403.
3. Hu Y, Atik A, YuH, LiT, ZhangB, Li D, et al. Serum heparanase concentration and heparanase activity in patients with retinal vein occlusion. Acta Ophthalmol. 2017;95(1):e62-e66. doi:10.1111/aos.13170.
4. Iijima H. Mechanisms of vision loss in eyes with macular edema associated with retinal vein occlusion. Jpn J Ophthalmol. 2018; 62(3):265-73. doi:10.1007/s10384-018-0586-5.
5. Sunshine WL. The promise of topicals for retinal disease. Retin Physician. 2017;14:52-70.

Submitted for publication: December 19, 2018
Accepted for publication: January 4, 2019

Funding: No specific financial support was available for this study.

Disclosure of potential conflicts of interest: The author have any potential conflicts of interest to disclose.

Corresponding author: Marianne Shahsuvaryan.
E-mail: mar_shah@hotmail.com