What Is New in *Ophthalmic Research* – Focus on VEGF

Intravitreal Bevacizumab versus Triamcinolone Acetonide for Exudative Age-Related Macular Degeneration

Jonas et al., Heidelberg, Germany

Ophthalmic Res 2009;41:21–27

In a comparative nonrandomized retrospective clinical interventional study including 305 patients with progressive age-related macular degeneration, the improvement in central visual acuity was better after intravitreal application of bevacizumab (1.5 mg) than after intravitreal injection of triamcinolone acetonide (about 20 mg). It suggests that intravitreal monotherapy using bevacizumab is superior to the intravitreal monotherapy using triamcinolone. Future studies may address whether a combination of both drugs may be useful in selected clinical situations.

Transient Bevacizumab (Avastin)-Induced Alterations in Rat Eyes

Sancho-Tello et al., Valencia, Spain

Ophthalmic Res 2009;41:28–35

Bevacizumab, an antibody against VEGF that blocks all its isoforms, is widely used for the treatment of neovascularization-related ocular diseases. Many experimental and clinical approaches have tried to establish its safety, and resulted in some advisory recommendations. The results in this rat experimental model show an inflammatory response to bevacizumab administration. Interestingly, these changes were only transient. Although bevacizumab modified electrophysiological parameters, these were also transient and were not accompanied by any biochemical changes in oxidative stress markers. The previously reported electroretinogram changes that might appear after bevacizumab administration should be interpreted carefully. This applies in particular to the immediate period after the intravitreal injection, but should be followed up to confirm their stability.

Overexpression of Thymosin β -10 Inhibits VEGF mRNA Expression, Autocrine VEGF Protein Production, and Tube Formation in Hypoxia-Induced Monkey Choroid-Retinal Endothelial Cells

Zhang et al., Beijing, China

Ophthalmic Res 2009;41:36–43

Thymosin β 10 is a small actin-binding protein known to sequester actin monomers, thereby resulting in antigenic and antitumor effects. In this article, the authors constructed an adenovirus vector expressing thymosin β 10, and demonstrated that overexpression of thymosin β 10 inhibits VEGF mRNA expression, autocrine VEGF protein production, and tube formation in hypoxic RF/6A cells. Thymosin β 10 may serve as a potential angiogenesis inhibitor for treating ischemic retinal and choroidal diseases.

Mineralocorticoids Restore Quiescent Morphology and Reduce VEGF Receptor Expression in Inflamed Choroidal Endothelial Cells in vitro

Fitzgerald et al., Crawley, Australia

Ophthalmic Res 2009;41:44–52

One of the most widely administered intravitreal agents for the treatment of ocular inflammatory diseases is the glucocorticoid triamcinolone acetonide (TA). However, concerns have been raised regarding the cytotoxicity of TA for photoreceptors and retinal pigment epithelial cells. In this article, it is shown that the mineralocorticoid fludrocortisone acetate (FCA) was more effective than TA in restoring quiescent morphology and reducing membrane permeability in activated endothelial cells. FCA and other mineralocorticoids also reduced cell surface expression of VEGF-R1, a proinflammatory receptor (with its ligand) known to contribute to the aggravation of inflammation. These reductions in VEGF-R1 expression were potentiated by the addition of avastin. In summary, this study demonstrates that the mineralocorticoid FCA is more effective than the glucocorticoid TA at restoring barrier function to corneal endothelial cells, and thereby reducing ocular inflammation.

Uwe Pleyer, Editor-in-Chief