What Is New in *Ophthalmic Research* – Disorders of the Retina

Poly(ADP-Ribose) Polymerase Offers Protection to the Nuclear and Mitochondrial Genomes of the Retinal Pigment Epithelium

Jarret and Boulton, Cardiff, UK/Galveston, Tex., USA
Ophthalmic Res 2007;39:213–223.

Genomic injury has been postulated to play a major role in cellular dysfunction that occurs in age-related macular degeneration (AMD). This study provides evidence that the DNA repair protein, PARP (ADP-ribosyl)ation activity is required to facilitate nDNA and mtDNA repair in the RPE. In regard to the nucleus, PARP may have a role in providing efficient nDNA repair against oxidative and nonoxidative injury. Interestingly, this nDNA repair capacity may well be a critical factor in allowing the RPE to function in its native highly oxidizing environment. In regard to the mitochondria, PARP activity also played a role in mtDNA repair. However, mtDNA repair was inefficient and 'un-repaired' mtDNA damage coincided with RPE cell death. Potential challenges include a greater understanding of the mitochondrial repair mechanisms in order to help develop novel therapeutic approaches which increase mtDNA repair and thus prevent or slow down the pathogenesis of AMD.

Is Vitrectomy Necessary for the Treatment of Macular Edema Associated with Branch Retinal Vein Occlusion?

Hirano et al., Nagoya, Japan
Ophthalmic Res 2007;39:207–213.

The authors compared the efficacy of a combination therapy of triamcinolone acetonide (TA) administration with (vitrectomy with TA group) and without (TA-injected group) vitrectomy in eyes with macular edema associated with branch retinal vein occlusion over a 1-year period. Mean visual acuity and macular thickness improved significantly from baseline in both the TA-injected and the vitrectomy with TA groups. At 12 months after the therapy, there was no significant difference in visual acuity and macular thickness between the two groups. At the early post-operative stage (1 and 3 months after the therapy), the central macular thickness in the TA-injected group was significantly less than that in the vitrectomy with TA group; there was no significant difference in visual acuity between the two groups. TA injection without vitrectomy was as effective as a combination therapy of triamcinolone acetonide injection with vitrectomy.

VEGF Induced Angiogenic Auto-Loop in Diabetic Retinopathy

Zhao-Jiang et al., Xi'an, China
Ophthalmic Res 2007;39:224–231.

Diabetic retinopathy is characterized by an increased retinal neovascularization mainly due to the action of VEGF as an angiogenic factor. In this study, the authors demonstrated that the upregulation of VEGF, Ets-1, and pERK1/2 followed the same time course in the retina of diabetic rats, and that the inhibition of the ERK1/2 pathway and blockade of Ets-1 could decrease VEGF expression. In addition, previous reports have proven that the protein levels of two VEGF receptors, Flt-1 and Flk-1, are significantly upregulated after diabetes induction. Thus, we propose that VEGF, Ets-1, and ERK1/2 may act synergistically in the pathological development of diabetic retinopathy with the involvement of both Flt-1 and Flk-1 and a possible VEGF-induced VEGF-VEGFR-ERK-Ets-1-VEGF cascade auto-loop may play a primary role in the diabetic retinal neovascularization. However, the present study just presented some clues to this hypothesis and further evidence is necessary to confirm it.

Heavy Silicone Oil for Inferior Retinal Detachment

Herbrig et al., Dresden, Germany
Ophthalmic Res 2007;39:198–206.

Retinal detachment combined with PVR in the inferior areas of retina is still a therapeutic challenge. To provide a sufficient intravitreal tamponade in these cases, so-called 'heavy silicone oils' had been developed in the last years. In the study presented here, a cohort of 99 patients with complicated retinal detachment – most of the eyes underwent previous unsuccessful retinal surgery – were examined. Anatomical success was achieved in 78 of 89 eyes (87.6%) with completed follow-up at about 9 months. Visual acuity did not change significantly (from mean preoperative logMAR 1.88 to postoperative logMAR 1.96, $p = 0.9$). The good intraocular tolerance of Densiron® 68 recently described in some studies could be confirmed by this examination in most cases; nevertheless, the tendency towards a more frequent moderate intraocular inflammation with Densiron® 68 in situ should be carefully observed in future studies. These results support the hypothesis of Densiron® 68 as potent tamponade agent for complicated retinal detachment in the inferior retinal segments especially in eyes where previous operation failed.

Uwe Pleyer, Editor-in-Chief