Editorial

Controversies in Ocular Pharmacology

Andrzej Grzybowski

This special issue discusses most important and controversial topics related to the ocular pharmacology by major experts in these fields.

The use of anticoagulant and antiplatelet treatments in the prevention of thromboembolism has significantly increased in recent years. It is generally agreed that cataract surgery, and intravitreal injections are low-risk procedures for bleeding complications and discontinuation is not necessary. However, there is no standard recommendation whether to discontinue anticoagulant or antiplatelet agents in patients when ocular surgery of higher risk for bleeding is performed. Discontinuing systemic treatment may significantly increase the risk of systemic thromboembolic complications, but continuing systemic treatment may increase the risk of vision-threatening surgical complications associated with bleeding. Grzybowski *et al*. reviewed the issue of anticoagulants in vitreo-retinal surgery as a high-risk for bleeding complications procedure [1].

The use of nutritional supplements in medicine and in ophthalmology has become an controversial issue in recent years. Lawrenson *et al*. presents the summary of the evidence for the benefit of supplementation with antioxidant vitamins and other micronutrients for three of the most common eye diseases of the elderly: age-related macular degeneration (AMD), cataract and dry eye syndrome (DES) [2]. They show high quality evidence to support the use of an Age-related Eye-disease Study (AREDS) supplement containing antioxidants (β-carotene, vitamin C and vitamin E) and zinc to slow progression in those at moderate to high risk of developing advanced AMD. AREDS2 trial provided data to suggest that β-carotene could be replaced with lutein and zeaxanthin on the based on improved safety without compromising efficacy.

Pathophysiology of glaucoma is multifactorial and not very clear. Elevated eye pressure is the main risk factor for the disease and the main goal of medical treatment is the reduction of intraocular pressure. There are five main classes of topical drugs in glaucoma treatment, including beta-blockers, carbonic anhydrase inhibitors, prostaglandin derivatives, sympathomimetics and miotics. Bucolo *et al.* present a review, which focuses on medical treatment of glaucoma with particular attention to novel molecules in pre-clinical or clinical development [3].

Uveitis includes different conditions characterized by intraocular inflammation and its pharmacological treatment includes many controversies. Barry *et al*. analyse major systematic reviews focused on key therapeutic questions in infectious and non-infectious uveitis [4].

Different ocular diseases, including diabetic retinopathy (DR), retinal vascular disorders, and uveitis might lead to macular edema (ME). The pathophysiology of ME is still poorly understood, although it is generally accepted that inflammation plays a crucial role in its genesis. The common present treatment includes intravitreal steroids and/or anti-VEGF drugs. Vujosevic *et al*. present the review which addresses the most important results on the use of intravitreal steroids and anti-VEGF drugs, starting from molecular basis to the most updated randomized clinical trials [5].

Retinal toxicity from systemic and ocular medications remains an infrequent complication of treatment. This drug-induced retinopathy may manifest as generalized retinal dysfunction, maculopathy, retinal vasculopathy, or via other mechanisms. Early recognition of the disorder is important in order to limit the risk of further visual loss, as well as to identify potentially life-threatening adverse events. Schwartz *et al*. discuss the vascular drug-induced retinopathies caused by aminoglycosides, talc, oral contraceptives, interferon alpha, and other agents [6].

Proliferative vitreoretinopathy (PVR) is the most common cause of failure in surgery of with rhegmatogenous retinal detachment (RRD). Gagliano *et al.* present and discuss the present knowledge on PVR pathogenesis, including growth factors and cytokines from the vitreous and from the serum as well as complicated interactions with RPE and Muller cells what lead to membrane formation and contraction [7]. They show that identification of pre-operative risk factors, recognition of the early signs of PVR, use of adequate surgical techniques and of pharmacological therapy can reduce the PRV incidence.

Although endophthalmitis following intravitreal injection has been rare, pre- and post-injection antibiotic prophylaxis was commonly used for many years.

Schwartz *et al.* review all major studies evaluating the role of prophylactic topical antibiotics in this setting [8]. Although there is insufficient RCT evidence to unequivocally address the question of the effectiveness of antibiotics for prophylaxis of endophthalmitis in routine intravitreal injections, they show that in many series topical antibiotics did not decrease, and may in fact increased the rate of endophthalmitis. Povidone-iodine rather than antibiotics is preferred for the majority of patients undergoing intravitreal injections.

Pseudophakic cystoid macular edema (PCME) is the most common cause of poor visual outcome following cataract surgery. Its pathophysiology remains uncertain and a multitude of mechanisms have been suggested. Tsangaridou *et al*. present different pathophysiological pathways of PCME, risk factors, different definitions, epidemiology, and treatment options [9].

In the last 60 years, there has been a marked increase in the prevalence of myopia in younger generations in developed countries in East and Southeast Asia, and there are signs of similar, but less pronounced increases in North America and Europe. In some parts of the world, 70-

90% of children completing high schools are now myopic, and as many as 20% may be highly myopic. Grzybowski *et al*. present the up-to-date review on myopia pathogenesis, risk factors for progression, complications related with high myopia, and the prevention of myopia progression with atropine drops, especially a low concentration of atropine [10].

REFERENCES

[1] Grzybowski A, Kupidura-Majewski K, Kupidura P. Controversies in anticoagulant therapy in vitreo-retinal surgery. Curr Pharm Des 2015; 21(32): 4661-6.
[2] Lawrenson JG, Grzybowski A. Controversies in the use of nutritional supplements in ophthalmology. Curr Pharm Des 2015; 21(32): 4667-72.
[3] Bucolo C, Platania CBM, Reibaldi M, *et al*. Controversies in glaucoma: current medical treatment and drug development. Curr Pharm Des 2015; 21(32): 4673-81.
[4] Barry R, Denniston AK. Controversies in Pharmacological Treatment of Uveitis. Curr Pharm Des 2015; 21(32): 4682-7.
[5] Vujosevic S, Midena E. Controversies in pharmacological treatment of inflammatorz component of macular edema. Curr Pharm Des 2015; 21(32): 4688-93.
[6] Schwartz SG, Grzybowski A, Wasinska- Borowiec W, Mieler WF. Update on pharmacologic retinal vascular toxicity. Curr Pharm Des 2015; 21(32): 4694-7.
[7] Gagliano C, Toro MD, Avitabile T, Stella S, Uva MG. Intravitreal steroids for the prevention of PVR after surgery for retinal detachment. Curr Pharm Des 2015; 21(32): 4698-702.
[8] Schwartz SG, Flynn HW, Grzybowski A. Controversies in Topical Antibiotics Use With Intravitreal Injections. Curr Pharm Des 2015; 21(32): 4703-6.
[9] Tsangaridou M, Grzybowski A, Gundlach E, Pleyer U. Controversies in NSAIDs use in cataract surgery. Curr Pharm Des 2015; 21(32): 4707-17.
[10] Grzybowski A, Armesto A, Szwajkowska M , Iribarren G, Iribarren R. The role of atropine eye drops in myopia control. Curr Pharm Des 2015; 21(32): 4718-30.
[11] Bandello F, Cicinelli MV, Battaglia Parodi M. Anti-VEGF Molecules for the Management of Diabetic Macular Edema. Curr Pharm Des 2015; 21(32): 4731-7.

Andrzej Grzybowski

Department of Ophthalmology,
Poznan City Hospital, Poznan,
Poland
Dept. of Ophthalmology,
University of Warmia and
Mazury, Olsztyn,
Poland