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Advances in Medical Treatment of Diabetic Retinopathy

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SUMMARY

Despite improved control of blood glucose levels and hypertension, diabetic retinopathy remains the leading cause of blindness in working-age individuals of developed countries. When proliferative diabetic retinopathy or clinically significant diabetic macular oedema appears, argon-laser photocoagulation is presently indicated and its efficacy has been widely demonstrated. However, this is an aggressive treatment that destroys healthy parts of the retina and plays no role in retinopathy prevention. Intravitreal corticosteroids have been successfully used in eyes with persistent DME and loss of vision following the failure of conventional treatment. However, reinjections are commonly needed, and there are substantial adverse effects such as infection, glaucoma and cataract formation. In advanced stages of DR intravitreous anti-VEGF agents have emerged as new treatments but they are yet to be approved for DR. Vitreo-retinal surgery is an expensive and complicated treatment that should be carried out only by vitreoretinal specialists experienced in this procedure and it is normally reserved for the ultimate blinding complications of PDR such as severe vitreous hemorrhage and secondary retinal detachment. For all these reasons, new pharmacological treatments based on the understanding of the pathophysiological mechanisms of diabetic retinopathy are needed.

The beneficial effects of fenofibrate and candesartan on ophthalmological outcomes have been reported in clinical trials. It should be noted that their positive effects on diabetic retinopathy were unrelated to the primary actions of these drugs (ie. reducing serum lipids and blood pressure, respectively), and that the mechanisms involved in their action at retinal level are currently under investigation. The results from our lab on the mechanisms by which fenofibrate exerts its beneficial effects will be presented.

Finally, it should be emphasized that before any microcirculatory abnormalities can be detected in ophthalmoscopic examination, retinal neurodegeneration is already present. Therefore, new strategies based on either the delivery of neuroprotective agents or the blockade of neurotoxic factors are currently being tested in experimental studies and in clinical pilot studies. The results of our group concerning new targets for neuroprotection will be discussed.