Avastin obliterates rubeosis iridis membrane but has little effect on IOP

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in Heidelberg

INTRAVITREAL anti-vascular endothelial growth factor bevacizumab (Avastin, Genentech/Novartis) can lead to a strong regression in the fibrovascular membrane at early stages that characterises rubeosis iridis which is seen in patients with central venous and arterial closure. Intraocular pressure, however, did not sink to normal levels through Avastin application alone.

“Due to its anti-angiogenic effect, intravitreal anti-VEGF antibodies represent a new treatment option for eyes with neovascular glaucoma, greatly reducing existing rubeosis iridis. Cyclophotocoagulation and retinal photoacoagulation are still necessary to normalise IOP, however,” reported Antje Dembinski MD, at the Congress of the DGII (German-Speaking Society for Intraocular Lens Implantation, Interventional and Refractive Surgery).

Dr Dembinski and co-authors Häberle, W Irlaue, and Pham, Vivantes Eye Clinic, Neukölln, Berlin, Germany, conducted a prospective comparative study in which 18 acute neovascular glaucoma patients received either primary cyclophotocoagulation or primary intravitreal bevacizumab injections. The primary therapy was randomised with six patients receiving cyclophotocoagulation and 12 receiving intravitreal 1.25mg bevacizumab injections.

Four weeks after the primary therapy, the investigator assessed the patients individually, giving additional cyclophotocoagulation or bevacizumab, in low response patients in which IOP remained high. The patients were followed for at least three months.

Eleven patients had neovascular glaucoma that was brought about by a central venous thrombosis and the remaining seven by a central arterial closure. There were seven female and 11 male patients in the investigation, with an average age of 76 years. The neovascular glaucoma was characterised by eye pain and rubeosis iridis, a fibrovascular membrane that grows on the iris surface and into the chamber angle causing aqueous drainage problems and increased IOP.

The investigator measured IOP in the affected eyes and took photo documentation of the rubeosis fibrovascular membrane both pre and postoperatively, at four weeks and three months. She categorised rubeosis into eye quadrants and stadia, papillary, iris stroma, gonio, and uveal ectropium. Success was defined as a 30% pre IOP reduction and setting rubeosis back by two stadia.

All of the patients had increased IOP preoperatively, in spite of local and systemic medications. Retinal laser coagulation treatments had been performed in two of the patients. The preoperative vision in the patient cohort was poor, with 17 low-vision eyes, able to see light projection and hand movements only, and one patient with poor vision. The mean preoperative IOP was 37 mmHg, with a range of 22-54 mmHg.

Three months after treatment, cyclophotocoagulation showed a much greater tendency to help reduce IOP compared to the bevacizumab treatments. Due to persistently elevated IOP, four bevacizumab and one of the cyclophotocoagulation patients received additional panretinal or cryoocoagulation four weeks later, which helped reduce pressure in most cases. It was noteworthy that at three months after the treatment, four of the bevacizumab patients had higher IOP than preoperatively, Dr Dembinski observed.

The bevacizumab results were much better with regard to rubeosis regression. Of the 12 patients that had primary bevacizumab treatment, four patients had a complete regression of the fibrovascular membrane, after just four weeks from therapy. At three months, seven in all had a complete regression, compared to only two in the cyclophotocoagulation group.

Visual acuity did not improve for the cyclophotocoagulation group or bevacizumab group patients from the preoperative status.

She explained that retinal ischemia was caused by vascular closure and led to the induction of hypoxia-induced vascular growth factor. Vascular growth factors stimulate the process of new vessel growth in neovascular glaucoma to compensate for vessel closure in this disease. While anti-VEGF was helpful in reversing rubeosis formation, cyclodestruction of the fibrovascular membrane through laser treatment could not be avoided to reduce high IOP in some patients, Dr Dembinski commented.

Patients responded differently to cyclophotocoagulation and bevacizumab due to the large heterogenicity of the patient group, requiring individualised treatment regimes, she said. The primary concern with rubeosis is treating the secondary problem of glaucoma. In the past, IOP was often difficult to control, requiring medical and surgical treatments.

The intravitreal application of bevacizumab in rubeosis patients is effective as an adjuvant treatment option in the early active stages of neovascular glaucoma. It allows the ophthalmologist to win time when laser coagulation therapy is not possible due to cataract, narrow pupils, and vitreal bleeding, to promote neovascular regression, she noted.