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Intraocular pressure (IOP) management in patients with ocular hypertension and glaucoma following intravitreal injections of anti-VEGF agents

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Purpose: To determine the best standard of practice of intraocular pressure (IOP) management in patients with ocular hypertension and glaucoma following intravitreal injections of anti-VEGF agents. To assess the short term effects of intravitreal lucentis on intraocular pressure in patients with ocular hypertension and glaucoma

Methods: This was a prospective, observational study carried out between August 2011 and February 2011 in the Department of Ophthalmology, Maidstone Hospital. 24 participants (13 female, 11 male) with established ocular hypertension and glaucoma were chosen from a cohort of patients receiving intravitreal Ranibizumab (Lucentis) treatment for age related macular degeneration in the Department of Ophthalmology, Maidstone Hospital. Severity of ocular hypertension and glaucoma was classified into three categories; disc damage and visual field loss, disc damage only and no disc damage or visual field loss i.e. ocular hypertension. Within a period of two months prior to their intravitreal treatment, all patients underwent thorough ophthalmological investigations, which included determination of best-corrected Snellen visual acuity, slit lamp and fundal biomicroscopy, optical coherence tomography and fundus fluorescein angiography. OCT and FFA images were analysed by a medical retinal specialist. On the day of their intravitreal treatment, patients with established glaucoma and ocular hypertension had the following parameters measured; baseline intraocular pressure using the Icare® tonometer, optic disc examination using slit lamp biomicroscopy and visual field assessment with Humphrey SITA standard 24-2 perimetry. All study patients received Apraclonidine 1% and IOP was re-measured 30 minutes prior to their intravitreal injection. Patients then received 0.05mL of intravitreal Ranibizumab (Lucentis) for treatment of their wet age-related macular degeneration and it was recorded whether there was presence of a subconjunctival bleb. Post injection, IOP was measured at the following time intervals; immediately post injection, 5 minutes, 15 minutes and 30 minutes. This was continued up to 60 minutes post injection or until the reading was within 5mm Hg of the baseline IOP. Anterior paracentesis was performed if: Immediate post injection IOP > 50mm Hg - Immediate post injection IOP > 40 mmHg and there was evidence of disc damage - Immediate post injection IOP > 30 mmHg with evidence of disc damage and visual field loss.
Results: Out of the 24 patients with established ocular hypertension and glaucoma, 67% had established disc damage and visual field loss. 16.5% had disc damage only whereas the remaining 16.5% had no evidence of disc damage or visual field loss. Mean baseline IOP was 16.92 mmHg (SD 4.98, 95% CI 14.95 to 18.88). Thirty minutes post Apraclonidine 1% administration, mean IOP was 15.71 mmHg (SD 4.58, 95% CI 13.74 to 17.67) Paired Student’s t-test giving a P value of 0.368 indicated that administration of Apraclonidine 1% prior to intravitreal treatment did not cause a statistically significant IOP reduction in patients with ocular hypertension and glaucoma. Immediately post injection, mean IOP was 41.54mm Hg (SD 14.1, 95% CI 37.20 to 45.88). Paired T test results showing a p value < 0.0001 confirmed a statistically significant difference between baseline and immediate post injection IOP. 13 out of 24 (58%) of the study patients required anterior paracentesis post intravitreal injection according to our devised protocol. There was no statistically significant difference in baseline IOP between the paracentesis and non-paracentesis groups. The presence of a bleb post injection had no statistically significant bearing on immediate post intravitreal IOP.

Conclusions: Intravitreal Lucentis appears to cause an immediate significant but transient rise in IOP which is reduced after a mean time of 5 minutes. Although the clinical significant of this IOP spike is still unknown, extreme care must be taken in patients with ocular hypertension and glaucoma particularly those with established disc damage and visual field loss. Apraclonidine 1% appears to have a limited role in the prophylactic lowering of IOP pre-injection. The authors propose the use of the formulated paracentesis protocol for intraocular management in patients with ocular hypertension and glaucoma receiving intravitreal anti-VEGF treatment.