Case Record 11

Referral for Open Angle Glaucoma
Based on referral criteria

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Glaucoma detection in the community.

There is no standardised approach for glaucoma detection (Spry and Sparrow 2001).
To improve referral patterns the Ophthalmology Department at the Royal Victoria Infirmary (www.newcastle-hospitals.org.uk) (Appendix 1) has a publicly accessible protocol.

19th April 2006

This patient presented reporting a family history of glaucoma and tensions were higher than 25mmHg. This falls within the RVI referral criteria (Appendix 1), assuming the measurements were confirmed and adjusted for corneal thickness (Brandt et al 2003).

The CD ratios were estimated as R 0.5 and L 0.7. The temporal neural rim of the left disc was assessed visually as slightly thinner, with slight peripapillary atrophy at the site of thinning. No further signs, such as vessel bayoneting, circumlinear vessel barring, disc haemorrhages or RNFL defects, were noted.
Other subtle changes were recorded. The GDx NFI figure for the left eye, while within normal tolerances (Laser Diagnostic Technologies 2004), was higher than the previously. The fields did not show statistical pattern losses, but the OD was reduced in the left eye. Anderson (1992) reports that comparing the patient's thresholds to previous fields, rather than to the age normal ranges can identify glaucomatous generalised depression.

The decision to refer for an Ophthalmologist's opinion was taken.

27th June 2006 – Ophthalmology Assessment and Latanoprost.

Heijl et al (2002) consider it appropriate to monitor some patients, although this must depend on individual risk factors. In this case the patient is in a higher risk group (Young age, OHT, FHG, asymmetric cups), and the consultant instigated treatment with Xalatan® nocte.

Prostaglandins are pro-inflammatory chemical mediators (Camras 1996b) and this increases uveoscleral outflow.

Prostaglandins are commonly drugs of first choice in the treatment of glaucoma (BNF 2007, Heath 2002, Heath 2004 and Titcomb 2007). Prostaglandins demonstrate equal (Watson and Stjernschantz 1996) or superior (Camras 1996a, Camras 1996b) hypotensive effects compared to the β-Blocker Timolol, require single daily administration (Phelan 2002) so aiding compliance (Watson 1998), and show very few serious side effects (BNF 2007, Camras 1996b).
Common undesirable effects include inceased iris pigmentation, mild to moderate conjunctival hyperaemia and transient punctate epithelial erosions (Camras 1996b, electonic medicines compendium).
A more serious side effect of prostaglandins, due to their pro-inflammatory nature, is to exacerate asthma, iritis, uveitis and local oedema (emc 2007, Camras 1996b, BNF 2007). At the concentrations stipulated these effects have not been found to be clinically significant (Watson and Stjernschantz 1996).

The patient involved was relatively young, reported no general health problems and had not undergone any intra-ocular surgery. Non-selective β-blockers are known to cause cardiovascular and pulmonary side effects (BNF 2007, Camras 1996a, Geiser, Juzych, Robin and Schwartz 1996), the safer systemic side effect profile of Prostaglandins and the lack of more specific contra-indications for this patient would justify the initial choice of Xalatan®.

The SPC for Xalatan® (emc) recommends one drop in the affected eye(s) once daily and suggests the optimal effect is obtained with evening administration. The pivotal paper by Alm and Stjernschantz (1995) did report that evening administration was more efficacious in lowering IOP than morning dosing. However, the authors report maximal drug effect after 12 hours; their choice of sampling times favoured evening dosage.

Other papers (Kiuchi, Takamatsu and Mishima 1994, Kontas et al 1999, Kontas et al 2002, Watson 1998) do not support the improved efficacy with evening instillation.

While the literature suggests that the maximal drug effect is after 12 hours (Alm & Villumsen 1991, Hotehama & Mishima 1993, Hotehama *et al* 1993, Kontas *et al* 1999, Villumsen & Alm 1992), twice daily administration does not show an increased hypotensive effect. The SPC for Xalatan® (emc 2007) specifically states that 'dosage should not exceed once daily since it has been shown that more frequent administration decreases the intraocular pressure lowering effect'. Camras (1996b) reported higher dosing induced an increase in intraocular tension, while Linden and Alm (2001) as well as finding no benefit with increased administration reported more inflammatory side effects. The very low concentrations, 0.005% for Latanoprost (BNF 2007) and single daily administration mirror the very fine balance required for optimal effect (Camras 1996b).

20th June 2007 Review

Tensions were R 16, L 17mmHg. Since his initial assessment in June 2006 he had had two further follow-ups.

The single field conducted during this review is more suggestive of glaucoma. While cluster analysis is still normal, Pattern Defect is mildly significant, is significantly different to the 2006 figures, and the Patient HoV Deviation suggests statistical losses. The GDx does not demonstrate significant progressive RNFL loss since referral.

While a VF progression since referral has been noted, the HES based its' progression analysis on its' baseline VFs.
Wilson (2002), European Glaucoma Society (2003) and the Royal College of Ophthalmologists (2004) suggest that identifying visual field progression requires a series of up to 6 fields. The Advanced Glaucoma Intervention Study found that 30% of fields classified as progressed at 2 follow ups failed to maintain that classification. Variability in VF results is also a well-documented reflection of disease state, Anderson (1992).

No standard for identifying progression of VF loss due to glaucoma, or what constitutes a clinically significant reproducible change for the worse has been agreed (Wilson 2002). Katz, Congdon and Friedman (1999) report that the AGIS, CIGTS and EMGTS use different objective methodologies to quantify field progression. Few ophthalmologists adhere to objective measures in a clinical setting (S Fraser Ophthalmologist, personal communication); fields are time consuming and tiring; no data should be discarded in compliance with a set protocol, if it represents reliable information.
The most recent HES series of fields constitute the new baseline, post treatment commencement.

Target pressures are also subjective. It is very difficult, in practice, to determine an individualised target pressure for every patient. Zeyen (1999) and the European Glaucoma Society (2003) present models for target IOP estimation, listing a number of difficult to quantify variables. The Royal College of Ophthalmologists (2004) acknowledge that the final acceptable IOP may not necessarily be the target IOP.
The European Glaucoma Society (2003) and The Royal College of Ophthalmologists (2004) suggests that a generally accepted assumption is to achieve a 20% reduction from the initial level at which damage occurred, or in advanced glaucoma to maintain a pressure lower than 18mmHg at all clinic visits.
This goal was achieved for this patient.

Current Management Plan

The significant medical reduction in tension of over 40% has been achieved. The fields appear stable, a view supported by consecutive disc photos. Compliance and tolerance to the medication was confirmed. The consultant is satisfied with annual reviews and these could easily be managed within the community.

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