Welcome to the sixth issue of IMAGE - the first in a two-part series on glaucoma.

Currently it is estimated that approximately 300,000 Australians have glaucoma, with only half being diagnosed. With an ageing population and the likelihood of developing glaucoma increasing with age, a growing proportion of Australians are at risk of developing this disease.

Once detected though, the progression of the disease can be altered. This means that early detection is crucial and the services offered through CFEH critical in combating glaucoma.

Importantly, to comply with the new Guidelines for use of scheduled medicines (Optometry Board of Australia, 2010) to provide care for glaucoma patients, optometrists must have access to equipment that enables them to measure intraocular pressure and visual fields, allow nerve head and nerve fibre analysis and imaging, measure and analyse anterior chamber angles and measure corneal thickness.

With this in mind, it is encouraging to see that 50% of referrals to the Centre are for glaucoma and optic nerve related tests and assessments. In addition, we are provisionally diagnosing glaucoma in a number of patients referred to CFEH.

With the Centre housing all the necessary equipment and providing its services free of charge, this is another clear way that CFEH can assist optometrists in providing best practice patient management and ensuring unnecessary vision loss does not occur.

Prof. Michael Kalloniatis
Director

CASE REPORT

Dora is worried that she might have glaucoma

After talking to her neighbour who is being treated for glaucoma, Dora presents to her optometrist worried that she might also have glaucoma.

Dora is a 65 year-old lady who is generally quite happy with her vision. She is currently being treated for depression but otherwise she is enjoying good health.

Her optometrist noted a suspicious optic nerve in her right eye (Figure 1).

Issues to consider

1. How can the optic nerve be assessed further with scanning laser tomography?
2. What additional information can be provided with this instrument to assist in patient management?

Figure 1: Suspicious optic disc in Dora’s right eye.

Centre Update

Most optometrists are now registered and a large number are referring:

• 700 optometrists in NSW and the ACT are now registered.
• 300 optometrists have referred between one and 67 patients to the Centre since December 2009.
• 1800th referral received in August.

Despite the perception that patient’s won’t travel to CFEH, the evidence shows otherwise:

• 34% of clients in July were from western Sydney, 9% from regional NSW and the ACT, 16% from northern Sydney and 12% from southern Sydney.
Results and Discussion

The optometrist referred Dora to CFEH for glaucoma assessment due to a suspicious optic nerve head appearance in the right eye (Figure 2). Dora does not have a known family history of glaucoma, and best corrected visual acuity was 6/6 in each eye.

Applanation intraocular pressure was 17mmHg in each eye. Central corneal thickness was 523μm in the right eye and 513μm in the left. Anterior chamber angles were open to the ciliary body in all four quadrants in each eye.

The tests performed included GDxPRO, Optical Coherence Tomography (OCT) imaging of the optic disc, visual fields, optic disc photography, and Heidelberg Retina Tomograph (HRT3).

The HRT3 allows quantitative assessment of the optic nerve head and is useful in detecting and following optic nerve head changes in glaucoma. It revealed an average-sized optic disc in Dora’s right eye.

FDT Matrix 24-2 Threshold showed an inferior arcuate defect in the right visual field, which correlates with the superior rim thinning detected on the HRT3 and fundoscopy.

The topography image of the right optic disc from the HRT3 (Figure 3) revealed a relatively large vertical cupping, which is shaded in red. The neuroretinal rim is shaded in blue (sloped area) and green (flat area). A superotemporal notch (white colour) can be seen on the image (Figure 3), which corresponds to the area of marked thinning observed in the superior rim on fundoscopy (Figure 2).

The HRT3 reflection image of the optic disc (Figure 4) is divided into six regional sectors, which are compared to a normative database and classified as ‘within normal limits’ (as indicated by a green check mark), ‘borderline’ (yellow exclamation mark), or ‘outside normal limits’ (red cross).

The superotemporal and inferotemporal sectors of the neuroretinal rim in the reflection image of the right optic disc were classified as outside normal limits, according to the Moorfields Regression Analysis (Figure 4). However, only the superotemporal sector is consistent with the other findings.

The retinal nerve fibre layer (RNFL) profile (Figure 5), which relates to the retinal nerve fibre layer thickness, showed a marked depression superotemporally in the right eye where it dips into the red region (i.e. outside normal limits). This corresponds to the superotemporal notch shown in Figure 3. A p-value less than 0.05 (p<0.05) is considered significantly outside the normal range. Note: superotemporal is referred to as TS in the HRT3 printout, Figure 5.

Visual field testing with FDT Matrix 24-2 Threshold showed an inferior arcuate defect in the right visual field (Figure 6), which correlates with the superior rim thinning detected on HRT3 and fundoscopy. Based on these results, a provisional diagnosis of glaucoma was made. CFEH therefore recommended that the patient be referred to an ophthalmologist to confirm the diagnosis.
Eye Condition Spotlight - Glaucoma (part 1)

Glucoma is a group of optic nerve diseases that is characterised by progressive damage of the optic nerve as shown by changes in the optic disc, retinal nerve fibre layer, or visual field¹.

The word glaucoma is thought to come from the ancient Greek meaning clouded or blue green hue². This is understandable if patients presented in those times with eyes such as shown in Figure 7b.

Glucoma is responsible for a significant part of the health-care costs for eye disease in Australia and brings with it a considerable economic burden. The total cost of vision impairment in 2009 was estimated to be $16.6 billion, with $224m (8%) spent on glaucoma alone³.

Glucoma ranks fourth on the list of visual impairment in Australia by cause - behind age-related macular degeneration, cataract and uncorrected refractive error - and is responsible for 16% of blindness in the over 40 age group. This represents over 66,000 Australians³.

The prevalence of glucoma in Australians over 50 is thought to be 2.5%³. Glaucoma Australia estimates that in total approximately 300,000 Australians have the condition, with only half being diagnosed⁴.

The likelihood of developing glucoma increases with age, such that one in ten people over the age of 80 are thought to have this disease⁴.

With the ageing of the Australian population, more patients are likely to present to ophthalmic practitioners with glucoma. Thus, improved diagnosis of glucoma, and subsequent treatment, would reduce visual impairment and the economic cost of the disease in Australia.

Perhaps even more importantly, visual impairment can have a significant effect on a person’s quality of life, such as increased risk of falls by a factor of two, risk of depression increasing three times and being twice as likely to use health services³.

In the first instance, identifying individuals at risk of either having or developing glucoma requires a careful history. The National Health and Medical Research Council in Australia (NHMRC) has recently produced two documents in relation to glucoma, which are currently available on the internet⁵.

Identifying individuals at risk of either having or developing glucoma requires a careful history

Staff Profile

Staff Optometrist Agnes Choi has a special interest in glucoma, a “silent disease” affecting an estimated 300,000 Australians.

“Since there are usually no symptoms in the early stage of the disease, an individual has likely suffered some irreversible damage by the time they show symptoms. So early detection and treatment are the keys to prevent vision loss,” says Agnes who joined the Centre a year ago.

Agnes loves the diversity and challenges of her role at CFEH:

“The Centre has a very supportive professional environment and I’m constantly learning from and being challenged by the experience and different expertise of my colleagues. Many of our patients have complex eye conditions and it’s a privilege to assist them with the testing and diagnostic information our Centre provides.”

Agnes is a graduate of the UNSW School of Optometry and Vision Science. She brings clinical experience from private practice and the Institute for Eye Research (now the Brien Holden Vision Institute).

Figure 7a: Patient’s normal right eye.

Figure 7b: Patient’s left eye. Note the greenish colouration of the iris, the lack of iris detail due to corneal oedema and the vertical oval pupil. The intraocular pressure in this eye with a non-contact tonometer was 93mmHg.

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Eye-Condition Spotlight continued...

In the Literature Review final report, the NHMRC identifies risk factors to help identify patients who may be glaucoma suspects. These include:

- Race
- Age
- Family history
- Environment
- Migraine and peripheral vasospasm
- Eye injury
- Myopia
- Diabetes
- Medications (particularly steroids)

In the next edition of IMAGE we will discuss the components of an eye examination that the NHMRC discussion document suggests for examining the suspected glaucoma patient.

Note: The references are available on our website.

Referrer Support Services

CFEH offers a range of services to assist optometrists in referring to the Centre, including:

- A Series of Continuing Ophthalmic Professional Education (SCOPE) events covering cutting edge updates on diagnostic and management criteria;
- Regular IMAGE newsletters examining cases assessed at the Centre;
- A hotline to discuss results interpretation and management options;
- Shadowing a CFEH optometrist during appointments; and
- Attending the Centre with your patient.

To ensure CFEH is best able to support optometrists to utilise the services available through the Centre, a Referrer Services Coordinator has been employed.

As part of our continued development and refinement of our services, CFEH welcomes your feedback. Please email feedback@cf eh.com.au.

Next Issue

Is there one test that diagnoses glaucoma?

Frank, a 47 year-old white male presented to his optometrist with problems seeing small print. At the consultation his intraocular pressures were measured and found to be 24mmHg in the right eye and 26mmHg in the left eye. Visual fields were full but unreliable, but the optic discs looked suspicious superiorly in both eyes. He was referred to Centre for Eye Health for further investigation.

What imaging results would help you to better review this patient?

Centre for Eye Health assists eye-care practitioners to optimally manage their patients. With more than 20 state-of-the-art instruments in one location, the Centre provides an extensive range of advanced testing to detect, investigate and monitor eye disease at no charge to your patients.

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