COMPETENCIES COVERED

DISPENSING OPTICIANS
Communication, Standards of Practice, Ocular Abnormalities

OPTOMETRISTS
Communication, Standards of Practice, Ocular Disease

This CET has been approved for one point by the GOC. It is open to all FBDO members, and associate member optometrists. The multiple-choice questions (MCQs) for this month's CET are available **online only**, to comply with the GOC's Good Practice Guidance for this type of CET. Insert your answers to the six MCQs online at www.abdo.org.uk. After member login, go into the secure membership portal and CET Online will be found on the L menu.
Questions will be presented in random order. Please ensure that your email address and GOC number are up-to-date. The pass mark is 60 per cent. The answers will appear in the August 2021 issue of *Dispensing Optics*. The closing date is 9 July 2021.

General Optical Council
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C-77388 Approved for one CET Point

Brain tumours in your practice

By Lorcan Butler MCOptom, Prof Cert Paed Eye Care

Despite being widely considered rare, brain tumours are responsible for more deaths of children and younger people than any other type of cancer[1]. Brain tumours are divided into primary and secondary, adult and paediatric.

Primary tumours are those that originate within the brain itself; secondary brain tumours originate from elsewhere and metastasize in the brain (lung and breast being the most common sites). They are classified as low grade I-II or high grade III-IV.

Nearly 12,000 people in the UK will be diagnosed with a primary brain tumour each year, that's 31 per day. Approximately 4,000 more will have secondaries that have spread from cancers in other parts of their body[1]. Some 62 per cent of children who survive a brain tumour are left with a life altering, long-term disability[2].

Tumours of the central nervous system and intracranial tumours are the ninth biggest cancer killer in the UK, and the largest cancer killer of children[3]. Although primary brain tumours represent only three per cent of all cancers, they result in the most life years lost of any cancer[3].

Approximately 60 per cent of brain tumour diagnoses comes from self-referral to Accident & Emergency (A&E). This means there is a high percentage of patients who have advanced disease at diagnosis[4]. The most common age range for brain tumours in adults is 50 years and above, and the risk increases with each decade (**Figure 1**). The peak age of presentation is between 60 and 79 years[5].

Optometrists and dispensing opticians are a touchpoint for diagnosis, as some brain tumours do have ocular presentations that prompt the visit. Approximately 28 per cent of adults with a brain tumour report a visual impairment[7], which increases up to 39 per cent in children[8]. Therefore, it is imperative as primary care practitioners that all General Optical Council (GOC) registrants are able to detect subtle signs and symptoms of a brain tumour quite confidently. This equates to a quicker referral, accurate diagnosis and timely treatment.

Having a dispensing optician and/or a practice manager who is cognisant of some of these presenting signs and symptoms will help screen the importance of appointments being symptom-led, and patients being triaged appropriately. What could initially start as a telephone conversation for a routine appointment may need to be escalated to a more urgent assessment, or even a referral to a general practitioner (GP) or even A&E.

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Figure 1: Average number of new cases per year and age-specific incidence rates per 100,000 population, UK, 2015-2017[6] (image courtesy of Cancer Research UK)

RISK FACTORS FOR BRAIN TUMOURS

Common risk factors include:

- Age
- Leukaemia
- Neurofibramatosis
- Previous episode of lung and/or breast cancer
- Lifestyle: smoking/alcohol
- Family history of a brain tumour

Neurofibromatosis (NF) is a rare genetic disorder that causes typically benign tumours to form on nerve tissue. There are three different types: type 1, 2 and 3. An NF type 1 tumour can develop anywhere in the nervous system, including the brain, spinal cord and nerves. It is usually diagnosed in childhood or early adulthood and affects approximately one in 3,500 people worldwide. Lisch nodules on the iris are an ocular characteristic[9] (**Figure 2**).

SYMPTOMS OF BRAIN TUMOURS

These can be broken down into:

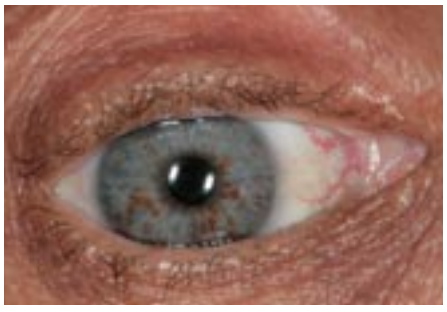

*Figure 2: Lisch nodules (credit: Dimitrios Malamos. **https://commons.wikimedia.org/w/index.php?curid=45193921)***

non-vision-related symptoms; and vision related symptoms.

Non-vision-related symptoms

Non-vision-related symptoms of a brain tumour include: a) headaches; b) seizures; c) vomiting; and d) cognitive changes.

a) Headaches

Headaches are not often the main primary presenting symptom in brain tumours. It has been reported that that only two to 16 per cent of patients have isolated headaches as the sole symptom of a brain tumour[10].

When we talk about headaches, we talk about headaches in addition to something else, a term that GPs call 'headache plus' concept, i.e. headaches *plus* behavioural changes (depression, anxiety, loss of inhibition), headaches *plus* excessive sleeping, etc. However, in very specific cases such as papilloedema, the headaches are a presenting feature in approximately 60 to 70 per cent of cases[11]

(**Figure 3**). Papilloedema headaches tend to:

- Be worse upon waking and when lying down in bed
- Be strong enough to wake you from your sleep
- Be associated with nausea and vomiting, sometimes projectile vomiting
- Be worse with valsalva-based movements, e.g. coughing, sneezing and bending down to tie a shoelace
- Appear to increase in severity over preceding weeks

New headaches presentation in patients over 50 years of age would be a cause for concern. Also, a new style of headache that is more severe, happening more frequently, and/or not being stopped by painkillers, etc, should warrant further investigation by the patient's GP.

b) Seizures

Seizures are the most common first symptom that lead to a brain tumour diagnosis in adults. When people hear the term seizure, they often think of convulsive seizures. This is where the person loses consciousness, their body goes stiff and they fall to the floor with their limbs jerking. However, this type of seizure (known as a tonic-clonic seizure) is rarely associated with brain tumours. There are many other types of seizures. The type of seizure most commonly noted with brain tumours is called a focal (or partial) seizure. Focal seizures affect only one part of the brain and can affect movement and/or the level of consciousness or awareness.

The symptoms of a focal seizure include:

- Feeling a bit strange or absent (spaced out). The person may not even notice this sort of seizure themselves, it may be recognised by a partner/spouse
- Unusual smell or taste, like burning toast
- Feeling of not being able to speak despite being fully conscious
- Numbness or tingling sensation
- Visual disturbance, such as coloured or flashing lights
- Hallucinations (seeing something that isn't there)

Figure 3. Headaches are a presenting feature in 60-70 per cent of cases of papilloedema

Box 1: Triage questions for transient visual obscurations

Have you ever experienced a sudden loss of vision in one eye?
Transient visual obscurations (TVOs) are very short lasting one to two seconds. Patient may not offer this information, however, if probed they may admit to experiencing this phenomenon. The typical loss of vision would be not just partial loss, but total visual field loss in one eye.

Do you every get moments when the vision goes dim or grey?
These tend to be the two words associated with TVOs – a 'greying out' or 'dimming' of the vision.

All seizures should be fully investigated by a GP or A&E.

c) Vomiting
Vomiting is usually first thing in the morning and may, or may not, be associated with nausea. It is usually projectile in nature.

d) Cognitive changes
This can be first noted by a family member/partner.

Vision-related symptoms
Vision-related changes of a brain tumour include: a) changes in vision; b) newly acquired diplopia; c) anisocoria; d) papilloedema; and e) nystagmus.

a) Changes in vision
Transient visual obscurations (TVOs) tend to be reported as the 'dimming' or 'greying out' of vision, which may be fleeting in duration lasting one to three seconds. Patients usually find it difficult to isolate if it is unilateral or bilateral in nature[12]. Sometime people may not even mention it all. However, if it was suspected that the patient was describing other symptoms listed in this article, it may be worthwhile going back and through some very specific questions establish if TVOs have been experienced by this person.

Box 1 looks at triage questions for transient visual obscurations.

b) Newly acquired diplopia
This could be where the patient, or the patient's partner, describes this to you face-to-face or over the phone. If one of their eyes is turned in towards their nose, this would be a cranial nerve VI palsy. The CN VI is the longest of the

Box 2: Diplopia triage questioning for DOs and CLOs

When triaging a patient, what further questions could you ask specifically relating to the diplopia?

Does it affect both eyes or one eye?
Most people don't know the answer to this question. You are trying to differentiate between monocular and binocular diplopia. Ask the patient to close one eye at a time, or put their hand over one eye at a time. If the diplopia disappears, this would be a sign of binocular diplopia, which in turn would suggest conditions of a vasculopathic (high blood pressure, high cholesterol, diabetes), neurogenic (CN paresis/palsy), or compressive nature (space occupying lesion). Monocular diplopia is often found with cataracts, keratoconus, irregular astigmatism, and macular distortion.

Is it there all the time?
You are trying to discover if the diplopia is physiological or pathological. It's natural as we age to lose tone of the eye muscles and, when we are tired, the muscles begin to relax to their habitual state. This may give rise to a decompensating phoria, breaking down into a tropia. Constant diplopia would exclude this.

Did it begin gradually or suddenly?
Gradually would be sign of a progressive condition like a brain tumour, while suddenly would be more vasculopathic in nature.

Are the images side-by-side or one on top of the other?
You are trying to find out which muscles are affected. Horizontal side-by-side would indicate the muscles that move the eyes left and right: the lateral and medial rectus muscles. Images on top of each other would indicate the muscles responsible for moving the eyes up and down.

What makes it better or worse?
Usually, closing one eye will get rid of the two images. The patient will have to tilt or turn their head in one direction to minimise or negate the doubling images. Looking in the distance will be much harder than near if there is a CN VI palsy.

cranial nerves from its origin in the Pons to its point of attachment. Tumours can be insidious in developing and wrap themselves around the nerve itself, restricting its movement. This would lead to a horizontal diplopia, which is worse for distance than it is for reading. This needs urgent referral to A&E for ophthalmological and neurological investigation[12].

Box 2 covers the types of questions that dispensing opticians and contact lens opticians could ask, specifically relating to diplopia, when triaging a patient.

c) Pupil involvement/anisocoria

A relative afferent pupillary defect (RAPD) would not be present in the early stages of a brain tumour, but may be present in the later stages as the optic nerve function is affected. Anisocoria is where there is a marked difference in the size of the pupils. One will be larger or smaller than the other. It may be long-standing in nature or it may be of a sudden onset.

A sudden onset anisocoria noticed by the practitioner, family member, and/or partner, should warrant further investigations. It may be more vasculopathic in origin, such as a tear in the Internal carotid artery, but it should warrant immediate assessment.

d) Papilloedema

Papilloedema is a bilateral swelling of the optic discs due to high intracranial pressure (ICP), one cause of which is a brain tumour. It can sometime be unilateral but that is quite rare. Eighty per cent of cases of ICP tend to be linked to a condition called idiopathic intracranial hypertension (IIH). This used to be referred as benign IIH, but its classification has changed due to its life-threatening severity.

IIH is usually found in young woman of child bearing age with a slightly higher than normal BMI. Other causes of raised ICP could be a space occupying lesion (brain tumour), venous sinus thrombosis (blood clot) or meningitis.

Box 3 looks at triage questions for DOs and CLOs related to headaches.

e) Nystagmus

Usually, nystagmus comes under two different classifications – either congenital or acquired. It can be either a primary sign of a brain tumour or secondary adverse drug reaction (ADR) due to the medication prescribed after surgery. Seizures would tend to be a feature of brain tumour diagnosis journey in approximately 30 per cent of cases[14]. Anti-epilepsy or anti-convulsant medication may be given post-surgery, and one of the known side-effects of these medications is that they may cause nystagmus[15].

Box 3: Triage questions for headaches

Are these headaches normal for you, or are they getting worse?
Most people have a typical headaches profile/presentation. What we are trying to establish is whether it is increasing in frequency and severity. People who say it is much worse than before, often experience severe vomiting whether with or without nausea.

Are the headaches worse at any time during the day?
Papilloedema headaches are usually present upon waking, and may even be strong enough to wake the patient up from their sleep.

Does the headache begin to get better when you get up and move around?
A papilloedema headache is typically worse when lying down, as there is a build-up of cerebrospinal fluid (CSF) that can't drain, and a secondary increase in intracranial pressure. As the patient moves around, and the CSF is able to drain and the ICP decreases, the headache eases.

HEADSMART

The Headsmart campaign was launched by the Brain Tumour Charity in association with the University of Nottingham in 2013, to increase the awareness of the signs and symptoms of brain tumours among healthcare practitioners and allied health practitioners involved in the care of children. It resulted in reducing the referral times for paediatric brain tumours from 13 weeks to six-and-a-half weeks, just by knowing typical signs to watch out for.

Headsmart is still a very important and active campaign currently used by the Royal College of General Practitioners as a clinical toolkit for the detection of pediatric brain tumors.

CONCLUSIONS

There are certain 'red flag' signs and symptoms that dispensing opticians and contact lens opticians need to be aware of in normal day-to-day practice, that may require urgent referral to either an optometrist, a GP or even A&E for suspect brain tumour. It is very difficult to list all the signs and symptoms of a brain tumour, but hopefully this article will better inform the eye care practitioner of specific symptoms that, if heard on the shop floor or on a telephone booking enquiry, should be addressed immediately.

LORCAN BUTLER is a dispensing optician and optometrist with the Brain Tumour Charity. In his role as optical engagement manager, he educates the UK optical community of the importance of the sector being part of the referral process for further investigation for suspect brain tumours.

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