MIGRAINE & OTHER HEADACHES: the role of the optometrist

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- Paid lectures & KOL/product feedback programmes:
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- Author of Pickwell's Binocular Vision Anomalies, editions 3-5
- I.O.O. Sales Ltd markets IFS Orthoptic Exercises, which the speaker designed, and the Pattern Glare Test, which he co-designed; for which he receives a small royalty
- Community optometric practice in Brentwood, Essex

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International Classification of Headache Disorders (ICHD-II)

International Headache Society, 2004 (1st edition 1988; minor revision section 8 2005; ICHD-III Beta under field testing)
Prevalence in the real world

Globally, 46% of adult population have an active headache disorder (Stovner et al., 2007).
- 11% for migraine, 42% for tension-type headache and 3% for chronic daily headache
- The disability attributable to tension-type headache is larger worldwide than that due to migraine.
- On the WHO’s ranking of causes of disability, HA is in the 10 most disabling conditions for the two genders, and into the 5 most disabling for women.

Role of the optometrist

ICHDI-II

IHS Classification (cont.)

Differential diagnosis: the signs

1. Essentially, know the typical, refer the atypical
2. “first or worst” rule
3. SNOOP
   a) Systemic symptoms / signs / disease
   b) Neurological Disease
   c) Onset Sudden (thunderclap)
   d) Onset after the age of forty
   e) Pattern change to the headaches
**Headaches from pathology**

- **If brain tumour:**
  - 50% have field loss
  - More like tension-type HA than migraine
  - Headaches worsening over time
  - Headaches worsen with physical activity
  - Other signs (personality change, neck stiff, seizure, papilloed.)
- **If sub-arachnoid haemorrhage:**
  - Very severe (thunderclap), vomiting, photophobia
  - Bilateral
- **If temporal arteritis**
  - Age (>60), deep throbbing, other signs

**Migraine aura: typical v. atypical**

- **Headaches always follow aura, never before**
  - In amaurosis fugax or sub-arachnoid haemorrhage could be any way round
  - Auras evolve (spread out) over time
  - Sudden onset could be embolic disease
  - Auras 5-60 mins
  - If <5 mins could be amaurosis fugax
  - If >1hr could be tumour
- **Auras positive effect**
  - In amaurosis fugax negative effect

**IHS Classification**

<table>
<thead>
<tr>
<th>Headaches</th>
<th>Secondary (5%)</th>
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<tbody>
<tr>
<td>Primary (91%)</td>
<td>5. Head trauma</td>
<td>9. Non-optic infection</td>
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<td>1. Migraine (54%)</td>
<td>6. Vascular</td>
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<td>2. Tension (26%)</td>
<td>7. Non-vascular intra-cranial disorder</td>
<td>11. Dissections of facial or cranial structures (inc. eye)</td>
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<tr>
<td>3. Cluster (7%)</td>
<td>8. Substances or their withdrawal</td>
<td>12. Neuropathies &amp; deafness</td>
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<td>4. Miscellaneous (9%)</td>
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**Migraine: should I refer them all?**

- Typical migraine does not need neuro-imaging
  - (American Academy of Neurology 1994; Detiky et al., 2006)
  - If diagnosis is obvious, no need for medical investigation
  - Letter of information to GP
  - If not very frequent, try analgesics first
  - See GP if not fully effective
  - Instruct to use diary
  - Identify any triggers → prevention

**Migraine onset: typical phases**

1. **Prodrome**
   - Hours to days
   - Heightened sensitivity to light, sound, smell, depression
2. **Aura**
   - 5-60 mins
   - Sensory (e.g., visual) or motor (speech)
3. **Headache**
   - 4-72 hours
   - Moderate or severe, pulsating
   - Maybe nausea/vomiting
4. **Post-dromal**
   - Washed out feeling
   - Sleep

**Role of the optometrist**

- **classification**
- **diagnosis**
- **visual triggers**
- **visual treatment**

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**Figures from Leone et al., 1994**

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**MIGRAINE WITHOUT AURA:**

at least 5 attacks which:

- last 4-72 hrs (untreated)
- have at least 2 of the following:
  - unilateral
  - pulsating
  - moderate/severe
  - aggravated by routine physical activity
- during HA at least 1 of the following
  - nausea and/or vomiting
  - photophobia and phonophobia

**MIGRAINE WITH AURA:**

2+ attacks with:

- fully reversible aura symptoms
  - e.g., vision, pins/needles/numbness, speech difficulties
- at least 2 of the following:
  - at least one aura symptom develops gradually over 5mins+ and/or
  - 2 or more symptoms occur in succession over 5mins+
- each symptom lasts 5-60min
- at least one aura symptom is unilateral
- aura accompanied and/or followed with 60min by HA

Subtypes

- typical aura with migraine HA
- typical aura with non-migraine HA
- typical aura without headache
- familial hemiplegic migraine
- sporadic hemiplegic migraine
- basilar-type migraine (e.g., diplopia)

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**Pattern glare/visual stress**

- High prevalence in:
  - Reading difficulties
  - Migraine
  - Photosensitive epilepsy
  - Autism

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**Optometric correlates of migraine**

- Subtle pupillary anomalies (Harle & Evans, 2004; Harle et al., 2005)
- Little evidence of visual field defects or increased risk of glaucoma (Harle & Evans, 2006a; Harle & Evans, 2005)
- Slightly higher prevalence of astigmatism and anisometropia (Harle & Evans, 2004; Harle & Evans, 2006c)
- Slightly higher prevalence of heterophoria and fixation disparity, but not usually a trigger (Harle & Evans, 2004; Harle & Evans, 2006b)
- The strongest visual correlate of migraine is pattern glare, which can be a migraine trigger (Harle & Evans, 2004; Harle et al., 2006)

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**Vision & headache:**

- Coloured filters
  - Pattern glare is prevalent in migraineurs
    (Wilkins et al., 1984; Marcus and Soso, 1989; Evans et al., 2002; Harle et al., 2006)
  - “what may be inherited in migraineurs is an abnormal biological threshold to a variety of visual stimuli” (Wray et al., 1995)
  - review of evidence linking Meares-Irlen Syndrome, visual stress, photosensitive migraine & epilepsy (Wilkins, 1995)
  - of 323 people seen in IoO SpLD clinic, 53% had more than 6 HA a year. 45% of these had at least 3 “associated factors” suggesting migraine (Evans et al., 1999)
Cortical excitation & chromatic sensitivity

Huang et al. (2002)  Xiao et al., 2003, Nature

PTL reduce cortical hyperactivation in migraine

MRI of 11 migraineurs & 11 non-headache controls
Viewed visual stressful & non-stressful patterns through PTL (POT), control colour, grey
Migraineurs & controls did not differ for non-stressful patterns
Migraines had greater activation than controls with grey or control colours
Normalised with PTL

Huang et al. (2011)

Double-masked placebo-controlled trial of Precision Tints in people with migraine

INTRODUCTION: the first double-masked placebo-controlled trial of precision tinted lenses for migraine
RESULTS: Precision Tinted lenses reduce frequency of migraines for reasons that cannot be solely attributed to a placebo
IMPACT: a new use for the Intuitive Colorimeter
Wilkins, Patel, Adjamian, Evans (2002)

BUT: probably <10% of migraineurs need PTL
Harle (2007)

Visual triggers for migraine

Glare
(Delbey, 1984)
- Sun reflections (water, beach, snow, paper, chrome)
- Bright lights
- Windows [e.g., blinds]

Flicker
(Delbey, 1984)
- Sun through trees/ceilings etc
- Stroboscopes [e.g., clubbing]
- Faulty fluorescent lights [& non-faulty]
- Television or cinema
- Light in traffic tunnels
- Flashlights or headlamps

Patterns
(Wilkins, 1995)
- Carpets, escalators, shirts
- Text

Role of the optometrist

classification
diagnosis
visual triggers
visual treatment

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**Tension-type headache: >10 attacks which:**
- last 30 mins - 7 days
- have at least 2 of the following:
  - bilateral
  - pressing/tightening (not pulsating)
  - mild/moderate (inhibits, not prohibits, daily activities)
  - not aggravated by routine physical activity
- both of the following
  - no nausea and/or vomiting
  - not both photophobia & phonophobia
- frequent, infrequent, and chronic varieties

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**CLUSTER HA: 5+ attacks which:**
- severe unilateral orbital, supraorbital and/or temporal pain lasting 15-180 mins untreated
- frequency of attacks: 1 every other day to 8 per day
- HA associated with at least 1 of the following:
  - ipsilateral conjunctival injection and/or lacrimation
  - ipsilateral nasal congestion and/or running
  - ipsilateral eyelid oedema
  - ipsilateral forehead and facial sweating
  - ipsilateral miosis and/or ptosis
  - sense of restlessness and/or agitation
- Not from another disorder

**IHS Classification (2nd ed cont.)**

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**Figures from Leone et al., 1994**
11.3 EYES:  
11.3.2 Refractive errors
- un- or mis-corrected Rx
- mild HA in the frontal region and eyes
- absent on wakening, worse with prolonged relevant tasks

Optometric viewpoint
- Headaches are commonest symptom in paediatric optometric practice
  - 27% of these are associated with study/reading (Elkins, 1991; cited by Barnard, 1996)
- No convincing evidence about type or degree of suspicious refractive errors

11.3.3 Heterophoria or heterotropia
- recurrent non-pulsatile mild/moderate frontal HA
- heterophoria or heterotropia is demonstrated with 1 of:
  - intermittent blur or diplopia
  - difficulty changing focus D/N
- at least 1 of the following:
  - HA occurs or worse during tiring visual task
  - relief by closing 1 eye
- HA resolves within seven days if visual problem is corrected

Asthenopia headache: summary
- “Headache is the commonest symptom associated with eyestrain. This occurs in almost every possible variety”
- All “obscure headaches” should have eye exam before medical treatment. Rule out:
  + Environmental factors
  + Refractive error
  + Binocular vision anomaly
  + IOP, fields, discs, vessels (Duke-Elder, 1970)
- No form of headache is specific to eye-related disorders (Ball, 1982)

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Headache diary
Enter every headache you experience in the table below. Impact ratings can be graded as: none, mild, severe, totally disabled. They can be graded as: mild, moderate, severe, very severe. Full sets of triggers that describe your headache before the headache. “Hormonal” refers to certain times in women’s monthly cycle. “Flickering” refers to flickering fluorescent lights, discos, or lights flickering through trees. “Patterns” refers to striped patterns. When you have completed the table, if any frequent triggers become apparent then try avoiding these. If visual stimuli (flickering, patterns) are triggers then precision tinted lenses may help. At Cole Martin Trigago Optometrists we have a special instrument, the Intuitive Colorimeter, to test for these; please telephone for an appointment.
Conclusions

- Optometrists can diagnose migraine
- Know the normal: refer the abnormal asap
- Refractive errors or binocular vision anomalies can trigger headaches
- Precision tinted lenses help some people with headaches (migraine)
- These people usually know who they are

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