# Headache - who should be investigated for brain tumour in primary care?

Patients who present with headache invariably think they need glasses, have high blood pressure or have a tumour. Headache presenting as an uncorrected refractive error is rare, a relationship with blood pressure is unlikely unless significantly raised but a tumour is always a concern for patient and practitioner alike.

The decision to investigate headache is based upon a number of complex factors. These include therapeutic value, clinical confidence of the doctor, time constraints within the consultation, availability of imaging, GP's and patient's approach to risk and uncertainty, reassurance of an anxious patient and medico-legal concerns. Due to the paucity of rigorous evidence in this area, expert opinion is an important input.

**Some tumour risks to bear in mind**

- Annual incidence in population – 6-10 per100,000.
- Headache presenting to GP – 1 in 1000.
- Headache presenting to GP if migraine or tension type headache can be diagnosed – 1 in 2000.
- Risk of tumour in isolated headache where diagnosis cannot be made after 8 weeks – approx 0.8 in 100.
- Risk of discovering incidental abnormality on investigation, 0.6-10 in 100.
- Suggested risk of tumour at which investigated should take place – 1 in 100.

- *The main advantage* of investigation is reassurance. If there is a tumour, early diagnosis may improve outcome but in many cases a short delay in diagnosis will not make a great difference to long-term outcome.
- *There are disadvantages*. Headaches are very common. Investigation consumes significant healthcare resources. The identification of incidental pathology, its clinical relevance and the unnecessary anxiety can be very significant problem. There may be implications for future life insurance applications. MRI. is distressing to a number of patients while the radiation exposure from CT should not be overlooked.
- *Investigation.* Although MRI is a more accurate modality, cost and availability will dictate the use of CT in many areas. CT can miss up to 10% of tumours, N.B. There are important secondary causes of headache where imaging can be normal and a normal investigation does not eliminate the need for appropriate management of a primary headache.
- *Guidance.* As in figure 1 and 2.

**Figure 1 – Recommended guidance for investigating for tumour in primary care.**

**Red Flags** – presentations where the probability of an underlying tumour is likely to be greater than 1%. These warrant urgent investigation.

- Papilloedema.
- Significant alterations in consciousness, memory, confusion or co-ordination.
- New epileptic seizure
- New onset cluster headache (imaging particularly of the region of the pituitary fossa required but non-urgent).
- Headache with a history of cancer elsewhere particularly breast and lung.
- Headache with relevant abnormal neurological findings or neurological symptoms.

**Orange Flags** - presentations where the probability of an underlying tumour is likely to be between 0.1 and 1%. These need careful monitoring

and a low threshold for investigation.

- New headache where a diagnostic pattern has not emerged after eight weeks from presentation.
- Headache aggravated by exertion or Valsalva manoeuvre.
- Headaches associated with vomiting.
- Headaches that have been present for some time but have changed significantly, particularly a rapid increase in frequency.
- New headache in a patient over 50.
- Headaches that wake from sleep.
- Confusion.

**Yellow Flags** - presentations where the probability of an underlying tumour is likely to be less than 0.1% but above the population rate of 0.01%. These need appropriate management and the need for follow up is not excluded.

- Diagnosis of migraine or tension type headache.
- Isolated weakness or motor loss.
- Memory loss.

**Fig 2. Guidance for new presentations of non-urgent headache that needs a pattern to emerge**

15% of isolated headaches (no other signs or symptoms) will be un-diagnosable at first presentation. The emphasis is on monitoring and allowing a diagnostic pattern to emerge. Extra vigilance is advisable in patients over fifty where the incidence of underlying pathology is higher.

i) At presentation (Approximately 0.06% risk)

- Exclude urgent headache as above
- Check blood pressure, fundoscopy and consider ESR if >50years to exclude temporal arteritis.
- If no diagnosis cannot be made (see appendix 2), tell patient - *"There is no evidence of anything serious underlying your headache but I would like to review you in one month"*.
- Ask patient to keep a headache diary.

ii) At one month

- Exclude urgent features as above. If diagnosis still uncertain:
- Assess memory and cognitive function during interview.
- Assess for symptoms that would indicate primary lesion elsewhere
- Examination (minimum set takes approximately three minutes.)

Fundoscopy, pupil responses, visual fields, (45° axis), eye movements, facial movements (raise eyebrows to ceiling, show teeth and grimace), corneal reflexes, protrude tongue, palm drift (outstretched hands, palms uppermost), finger-nose touching with middle or index finger, finger dexterity (play piano), limb and plantar reflexes, standing feet together eyes closed, tandem gait (walk heel to toe in straight line). Record in abbreviated format "fundi, fields, cranial nerves, reflexes, co-ordination, balance normal."

- Consider blood screen to exclude systemic illness or evidence of primary tumour elsewhere - FBC, ESR, CRP, LFT, creatinine, electrolytes, glucose, thyroid function.
- If diagnosis is still uncertain tell patient - *"There is still no evidence of anything serious but I would like to review you again in another month".*

iii) At two months (Approximately 0.8% overall risk)

- Exclude urgent features as above.
- Examination as above.
- If diagnosis is still uncertain tell patient - *"There is still no evidence of anything serious underlying your headache but we need to discuss whether it would be appropriate to have a brain scan. 3 in every 100 people like you will show an incidental finding that may give rise to unnecessary anxiety. This may have implications for future life insurance cover. 1 in every 100 people like you will show findings we may need to do something about."*
- Order blood investigations as above if not previously taken in addition to tests dependent on symptoms and history. E.g. VDRL, lyme titres, antiphospholipids

- If patient and doctor decide against imaging review again in one month.

**Further resources:**


1. Hamilton W, Kernick D. Clinical features of primary brain tumours: a case-control study using electronic primary care records. *British Journal General Practice* 2007;57:695-699.

2. Kernick D, Stapley S, Hamilton W. *Br J Gen Pract* 2008;58:102-104. GPs classification of headache: is primary headache underdiagnosed?

3. Kernick D, Ahmed F, Bahra et al. Imaging patients with suspected brain tumour. Guidance for general practitioners. *British Journal General Practice* 2008;58:880-885.