Headaches, Neurologists and the Emergency Department

Abstract:
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Abstract
This study explores the claim that headache management can be improved by evaluating current emergent care. A retrospective chart review investigated primary complaints of headache during a three-month period. Two hundred and twenty seven patients were identified for review and three-month follow-up using fully available records and imaging. A total of 227/8,759 had a neurological condition. The most common conditions were headaches (42% or 227 cases), cerebrovascular problems (26%) and seizures (17%). No ‘usual headache’ patterns showed abnormal imaging. In contrast, those with ‘sudden-onset’ type or clinical findings had an abnormal scan 17% of the time. Of the 153 ordered, one was abnormal in 26%. This left with 85% of patients with meningioma. Change of investigation in nine cases, 21% on repeat CT, 20% on repeat MRI, 19% a normal examination; and changing one CCT finding from ‘ischaemic stroke’ to an ‘SOL.’ In our discussion, we evaluate how well a tertiary referral ED treats its most common neurological complaint, focusing on the controversial topics of when to investigate and prevent of re-attendance.

Introduction
Studying the Emergency Department (ED) approach is particularly important in headache for several reasons. Firstly, the majority of secondary headaches are treatable if diagnosed in the early stages. Second, headache is by far the most common neurological complaint among the general population. Taking Irish national figures, of an estimated 700,000 neurological patients, 500,000 have migraine. Third, the majority of patients with headache will never meet a neurologist. This is particularly the case in Ireland with the lowest number of neurology consultants per capita in Europe. Literature suggests ED physicians may not always be following guidelines for acute treatment of primary headache. It also suggests that most patients continue to have headache after leaving the ED. To our knowledge, there are no studies on headache prevalence and its acute management in the Republic of Ireland and only a handful in Britain. This study aims to provide useful data in this regard, identifying all patients with a primary complaint of headache. We reviewed their investigations and the long-term management of their headache to consider how we might guide resources, argue for specialist headache clinics and suggest ways to improve current care.

Methods
This retrospective chart review was conducted in a tertiary hospital, seeing 100-125 ED presentations daily, one quarter of which are admitted. A total of 8,759 patients were seen from 2nd January to 25th March 2012. All patients were given a Manchester Triage category by registered nurse practitioners. On review of all possible triage categories, head injury was the most common reason for presentation if the headache was the primary complaint. The ED consultant was to be of low potential neurological yield, e.g. ‘abdominal pain’. This produced ~4,500 patient records written by an emergency physician for further review. Care was taken to ensure accurate recording, conforming to recommended guidelines in the literature for reliable retrospective chart review. We also included more vague triage categories such as ‘unwell adult’, to ensure no cases of a primarily neurological problem would be missed. Only headache recorded as the primary complaint by the ED physician prompted a comprehensive review of clinical findings, investigations, and discharge diagnosis. If a definitive headache diagnosis was not given, or was not clear from the ED record, a consultant neurologist was consulted. Follow up involved cross-referencing subsequent neurological outpatient records and any unscheduled re-attendances to the ED within three months, prior to and after the original study dates. Review was performed by one trained physician working in neurology. A pilot study was performed for a 2-week period, with a post-study review by an ED consultant and a consultant neurologist on the study’s direction, adequacy of data and their interpretation. Midway through the main study, the same team repeated this review. A standard excel sheet was prepared for data input. For analysis, Rigby et al’s categories of ‘usual headache’, ‘sudden or worst headache’, ‘abnormal exam’ and ‘Indeterminate’ were adopted.

Results
A total of 8,759 patients were seen in the ED during the study period. A total of 543 (6.1%) patients were deemed to have a primary neurological complaint, of which 227 of those were headache – an average of 5.46 neurological cases and 2.7 headaches per day. On review of all possible triage categories, head injury was the most common reason for presentation if the headache was the primary complaint. Only headache recorded as the primary complaint by the ED physician prompted a comprehensive review of clinical findings, investigations, and discharge diagnosis. If a definitive headache diagnosis was not given, or was not clear from the ED record, a consultant neurologist was consulted. Follow up involved cross-referencing subsequent neurological outpatient records and any unscheduled re-attendances to the ED within three months, prior to and after the original study dates. Review was performed by one trained physician working in neurology. A pilot study was performed for a 2-week period, with a post-study review by an ED consultant and a consultant neurologist on the study’s direction, adequacy of data and their interpretation. Midway through the main study, the same team repeated this review. A standard excel sheet was prepared for data input. For analysis, Rigby et al’s categories of ‘usual headache’, ‘sudden or worst headache’, ‘abnormal exam’ and ‘indeterminate’ were adopted.

A cranial computed tomography (CCT) study was performed in 127 of the 227 headaches (56%) – one patient refused to have a CT. Fifteen (12%) of these scans revealed an abnormality – 5 subarachnoid haemorrhages (SAH), 5 space occupying lesions (SOL), 1 haemorrhagic stroke, 2 ischaemic strokes, 1 subdural haematoma (SDH), and 1 scan showed chronic back pain which, over the three month period, amounted to a further 633 patients (7.2%). A breakdown of headache type is given in Figure 1. One hundred and forty six headache patients were female, the majority aged 20-39 years (n=159). Seventy (31%) of the headache patients were diagnosed as having a primary headache by the emergency physicians. Sixty-nine patients (32%) had secondary headache. Thirty-four of these patients (15%) had a serious secondary headache. Sixty-four patients (28%) were seen by neurology as either an in-patient or out-patient. Six patients were transferred to a neurosurgical centre before neurological review and six self-discharged. Medical records in which no definitive discharge diagnosis was given comprised 88 patients (39%).

Forty-two patients (18.5% of 227 headaches) had a lumbar puncture (LP). One patient refused. Twelve cerebrospinal fluid (CSF) samples were abnormal (29%). Nine demonstrated an elevated white cell count (all lymphocytic) and 3 revealed a leptomeningeal enhancement. Magnetic resonance imaging brain (MRI) studies were performed in 20 patients (9%) including two patients with a negative CT. Fifteen (12%) of these scans revealed an abnormality – 5 subarachnoid haemorrhages (SAH), 5 space occupying lesions (SOL), 1 haemorrhagic stroke, 2 ischaemic strokes, and 1 arteriovenous malformation (AVM). Five of the MRIs (25%) performed lead to a change in management from that planned after an initial CCT. These included changing an SOL to an AVM; a normal CCT to vertebral artery dissection; an intracranial SOL to a meningioma; changing possible SOL on CCT to a normal examination; and changing one CCT finding from ischaemic stroke to an SOL.

Discussion
Headache has been demonstrated in previous studies to account for 1-4.5% of all ED presentations and this is consistent with the 2.6% seen in our study. That 15% of these headache were found to have a serious secondary cause further highlights the importance of ED. One of the most controversial debates in acute headache management is the question of whether to perform CT imaging or not. In the face of patient expectation, the physician can often feel pressured to order unnecessary tests. Similarly, the question of ‘what if’ arises in the doctor’s mind, especially when met by someone that continues to present, raising ever-present legal concerns. It has been estimated that 0.4% of all cancer in the US is attributable to iatrogenic radiation and this figure is anticipated to rise to 1.5% within a generation. Averaging the radiation equivalent of 150 chest x-rays per CT brain, it is projected that one in every 20,000 will develop a significant cancer. The patients in this study were more likely to be young females, particularly vulnerable to such stochastic effects.

Our study supports the view that, in patients with their usual headache pattern and a normal examination, it is

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The strength of the study lies in its thorough review, cross-referencing and follow up. All patient records were available for review, benefiting from several electronic databases. A thorough search was conducted on all vague complaints with a potentially neurological cause in order to decrease the likelihood that any patient was missed. However, patients may have presented to another ED following first presentation. A larger study to estimate the incidence of such "lost causes" might be useful, as would the extent of analgesic misuse. Literature suggests hedges such as headache sufferers are less likely to present to the same ED (83% of the time) and the same GP (71% of the time). This is good news for any future large-scale headache management program. Secondly, this study was not concerned with the general prevalence of headache types in the community, but rather what type of headache comes to the ED. A further study could follow up these patients through their GP to determine final diagnosis. The very nature of clinical medicine makes such a study difficult, particularly given the study aim to estimate not just the number of headache type seen in the ED. It confirms that headache is a common and managed well accurately but could be improved both sub-acutely and chronically. As an interesting conclusion in support of a dedicated headache management program, research by Blumenfeld in 2003 supports an individualised headache management program for referrals from the ED and GPs, headed by a headache expert/neurologist and managed by a specialist nurse. With six month follow up, patients showed a substantial decrease in GP and ED visits, a reduction in costs, burden of illness and sustained patient satisfaction.

The discriminating physician needs to start identifying those at greater risk for poor outcomes and start to refer early and comprehensively. As an interesting conclusion in support of a dedicated headache management program, research by Blumenfeld in 2003 supports an individualised headache management program for referrals from the ED and GPs, headed by a headache expert/neurologist and managed by a specialist nurse. With six month follow up, patients showed a substantial decrease in GP and ED visits, a reduction in costs, burden of illness and sustained patient satisfaction.

References


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