

SHORT REPORT

Ability of a nurse specialist to diagnose simple headache disorders compared with consultant neurologists

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J Neurol Neurosurg Psychiatry 2005;76:1170–1172. doi: 10.1136/jnnp.2004.057968

Objective: To compare the ability of a headache nurse specialist and consultant neurologists in diagnosing tension-type headache and migraine.

Methods: An experienced neurology ward sister was trained in the differential diagnosis of headache disorders. Over six months, patients with non-acute headache disorders and role players trained to present with benign or sinister headaches were seen by both the nurse and a consultant neurologist. Both reached independent diagnoses of various headache disorders.

Results: Consultants diagnosed 239 patients with tension-type headache (47%), migraine (39%), or other headache disorders (14%). The nurse agreed with the consultant in 92% of cases of tension-type headache, 91% of migraine, and 61% of other diagnoses. Where the nurse did not agree with the diagnosis, most would have been referred for a consultant opinion. Both the nurse and the doctors misdiagnosed the same three of 13 role players. The investigation rate of the consultants varied between 18% and 59%. Only one clinically relevant abnormality was found on head scans and this was strongly suspected clinically.

Conclusions: A headache nurse specialist can be trained to diagnose tension-type headache and migraine. A nationwide nurse led diagnostic headache service could lead to substantial reduction in neurology waiting times.

Headache disorders account for 39% of referrals to the neurology clinics in our inner city hospital. Most patients have tension-type headache or migraine, with a smaller number having specific headache disorders (for example, cluster headache) and a very small proportion having an intracranial tumour.¹ Differential diagnosis is by history, with a limited contribution from examination and less from investigations. In the United Kingdom the number of neurologists per head of population is one quarter that of our European neighbours.² Consultant expansion will take many years. Nurse specialists in Parkinson's disease, epilepsy, and multiple sclerosis can reduce consultant workload. This study compared the abilities of a headache nurse specialist and consultant neurologists in diagnosing tension-type headache and migraine.

METHODS

Sandwell and West Birmingham Hospitals NHS Trust is an inner city teaching hospital which provides a secondary care neurology service to the local population. For six months headache referrals were vetted by consultant neurologists and all non-acute cases sent written invitations to attend headache clinics. An experienced neurology ward sister was trained for three months in the differential diagnosis of headache disorder. She attended neurology clinics, read

widely on headaches, and attended relevant specialist meetings. Patients giving written informed consent were seen by the nurse and then by a consultant neurologist or vice versa at random. After taking a history (the nurse using a proforma) and carrying out a neurological examination (including fundoscopy), they both came to independent diagnoses for each headache disorder, using the International Headache Society (IHS) 1988 criteria.³ An alternative to each primary (most severe), secondary, and tertiary diagnosis was permitted, to allow for uncertainty, especially in the case of medication overuse headache. As serious headache disorders are rare, professional role players were trained to mimic sinister headaches (for example, subarachnoid haemorrhage, temporal arteritis) after they had been examined by a consultant to exclude any coincidental pathology. Particular care was taken to ensure that both doctor and nurse were blind to whether the subjects were patients or role players.

RESULTS

In all, 239 patients (70% female; mean age 38.7 years) and 13 role players took part; 52% of patients were white, 34% were Asian, and 14% were Afro-Caribbean.

According to the consultant neurologists, tension-type headache was the most common diagnosis in patients (47%) followed by migraine (39%). The nurse reached exact agreement with the doctor's primary diagnosis in 68% of tension-type headache participants, 77% of those with migraine, and 34% of other diagnoses. The doctor's primary diagnosis was recorded by the nurse in one of her permissible diagnostic categories (primary to tertiary diagnoses and their alternatives) in 92% with tension-type headaches, 91% with migraine, and 61% with other diagnoses (table 1).

Of 30 participants in whom the nurse had not recorded any of the doctor's diagnoses, most were misclassification of tension-type headache as migraine or vice versa. The nurse referred 22 of these for evaluation by the doctor and the remaining eight were not investigated further by consultants.

Both doctors and nurse misdiagnosed the same three of the 13 role players who presented with chronic paroxysmal hemicrania (repeated short lived unilateral attacks missed), an unruptured vascular malformation (pulsatile tinnitus and focal symptoms missed), and intracranial neoplasm (early morning waking missed). It is possible that role players did not make clear important diagnostic details in the history.

The nurse referred 58% of participants for further medical opinion with a view to repeated examination or other investigations. The consultants referred 37% of participants for further investigations. Investigation rates varied considerably between the three consultants, at 18%, 32%, and 59% ($p < 0.001$, χ^2 test). There was no temporal change in the investigation rate of the consultants over the six months.

At the end of the study, the results of all investigations were followed up by the nurse to decide whether they were normal, showed a clinically irrelevant abnormality (for example, minor vascular disease), or showed a clinically

Table 1 Number of participants in whom the doctor's primary diagnosis was recorded in any of nurse's diagnoses (including role players)

Doctor's primary diagnosis	Recorded by nurse	Per cent of headache type	Total	Per cent of all headache types
Tension-type headache	108	92.3	117	46.4
Migraine	88	90.7	97	38.5
Drug overuse headache	7	87.5	8	3.2
Headache or facial pain with local disorders	3	42.9	7	2.8
Cluster headache	4	100.0	4	1.6
Headache associated with head trauma	3	75.0	4	1.6
Idiopathic stabbing headache	2	66.7	3	1.2
Subarachnoid haemorrhage	1	50.0	2	0.8
Intracranial neoplasm	1	50.0	2	0.8
Persistent (NOT tic-like) pain	0	0.0	2	0.8
Acute ischaemic cerebrovascular disease	1	100.0	1	0.4
Arteritis	0	0.0	1	0.4
Headache not classifiable	0	0.0	1	0.4
Trigeminal neuralgia	1	100.0	1	0.4
Headache from chronic use or exposure	0	0.0	1	0.4
Chronic paroxysmal hemicrania	0	0.0	1	0.4
Total	219	86.9	252	100.0

relevant abnormality which changed management. Eighty two patients had 108 tests. Of the 49 cranial computed tomography (CT) scans, 44 were normal, four showed a clinically irrelevant abnormality, and one showed a clinically relevant abnormality (a tumour which had been suspected). Of the 20 patients who had cranial magnetic resonance imaging (MRI), 12 were normal and eight had a clinically irrelevant abnormality. The computerised hospital records of all 239 patients were checked at least six months after their participation in the study to look for any in whom sinister headache pathologies had been missed. No relevant conditions were discovered.

DISCUSSION

A well trained headache nurse specialist reached the doctor's primary diagnosis in over 90% of cases of tension-type headache and migraine and 61% of other diagnoses. Where there was no diagnostic agreement, the nurse referred most cases for a medical opinion. In contrast, another study found only 69% concordance between clinical diagnosis using IHS criteria and that reached using a computerised structured record.⁴ Similarly, in a large study of older people, lay interviewers using a structured questionnaire had a low sensitivity (50%) for diagnosing migraine using IHS criteria compared with expert clinicians.⁵ The higher level of agreement in this study probably reflected the substantial prior neurological experience of the nurse, her extensive training in differential diagnosis before the study, and the fact that she had worked with the same consultants who had trained her.

One caveat is that the high proportion of non-white patients in this study compared with other areas of the UK may mean the results are not generalisable. However, closer examination showed that the nurse's diagnostic agreement was not affected by ethnicity.

Based on these encouraging results, we have developed a nurse-led headache service in which the nurse is allowed to diagnose tension-type headache and migraine independently and advise general practitioners on treatment according to consultant prepared protocols. Expansion of such a service nationwide could lead to substantial reduction in neurology waiting times.

The number of patients presenting to neurology outpatient clinics with headaches who should undergo further investigations, particularly neuroimaging, is controversial.⁶ The overall rate of investigation by consultants in this study was 37%, with a clinically relevant abnormality being found in only one of 44 CTs and in none of the 20 MRIs. A north American overview⁷ of studies in this area showed that in 897 patients with migraine and a normal neurological examination only four had abnormal CT or MRI imaging and two of these were suspected from the patients having seizures. Of 1825 patients with non-migraine headache diagnoses and a normal examination, 43 had abnormal CT or MRI imaging, with 21 of these having tumours. Traditional advice is only to image patients with sinister signs or symptoms. More recently patient pressure and awareness of the availability of imaging techniques has encouraged the use of radiology, if only to reassure the patient. This is a costly approach with little likelihood of a return in terms of an increased yield of treatable lesions.

The variance between clinicians in how many patients they investigated in this study is particularly interesting. The investigation rate varied from 18% through 32% to 59% for each consultant. The chance of finding sinister pathology was similarly low among the consultants, and computerised hospital records failed to suggest that serious conditions had been missed. Can this threefold variation in investigation rate be justified? This raises important issues regarding levels of experience, confidence, and the threshold for patient reassurance. With the current funding crisis in the NHS and the long waiting time for imaging, can such variations in practice be allowed? These issues need to be openly debated.

ACKNOWLEDGEMENTS

We are grateful for funding to Sandwell and West Birmingham Hospitals Trust Research Committee and AstraZeneca for an unrestricted grant. The computer was supplied by the Hull and East Yorkshire branch of the Parkinson's Disease Society.

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Competing interests: none declared

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Received 4 November 2004

In revised form 30 November 2004

Accepted 17 December 2004

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