A few patients had class "4" history grades but no positive radio-allergosorbent test results. This may indicate an allergen yet to be discovered—possibly an occupational one—a non-IgE-mediated mechanism or perhaps an exceptional interference in the radio-allergosorbent test by antibodies of another class. Whatever the reason, in such cases referral to an allergy specialist would be recommended. Indeed, referral should be considered when either the patient's symptoms are not fully explained by the report or advice on management is required.

We conclude that microcomputers are now powerful enough to operate a complex self-learning data base that may be used (a) for taking and analysing a standard history, (b) predicting the likely causes of symptoms, and (c) linking the results of IgE tests to the patient's history so that a valuable interpretation of the patient's symptoms can be used by the general practitioner as a basis for referral to an allergy specialist.

This work would have been impossible without either the assistance of Josephine Merrett in processing the IgE tests or the support of the Post Office and Civil Service Sanatorium Society.

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Contemporary Themes

Availability of computed tomography for the management of head injuries in England and Wales

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Abstract

Senior neuroradiologists or radiologists of 42 hospitals with computed tomography available for NHS patients in England and Wales were contacted by postal questionnaire about the use of this facility in the management of patients with acute head injuries. Replies were obtained from 39 hospitals. Requests for computed tomography from general surgeons or physicians and staff of accident and emergency departments received positive responses for scanning with only half to three-quarters the frequency of responses to requests from neurosurgeons. Continuous computed tomography facilities were available generally to neurosurgeons. The combined effect of partial responses to requests and the availability of the computed tomography service meant that only 44% of hospitals gave a continuous service for general surgeons or physicians. The percentage of hospitals giving a continuous service to accident and emergency departments was 54%. It appeared that computed tomography scanning was being used most often as a diagnostic/

management instrument after clinical selection among patients with head injuries rather than as an instrument to be used in primary assessment.

Introduction

Bartlett and Neil-Dwyer¹ have argued that the clinical efficiency of computed tomography and its role in the management of head injury requires improved access to this facility. Deployment of screening facilities to general hospitals with major accident and emergency departments could lead to satisfactory assessment and treatment of most head injuries without transfer to special units. Jennett and MacMillan,² however, considered that these scanning facilities would be underused because of a small flow of patients and that for any lesions found there may be an absence of the necessary surgical expertise. They favour quicker referral of larger numbers of patients with head injuries to neurosurgical units.

The effect of scanning in reducing mortality and morbidity has not yet been clearly shown in comparison with other forms of managing head injury. At the same time there is lack of agreement as to whether computed tomography should be part of the initial diagnostic/management response to the presentation of a patient with head injuries or whether diagnosis and assessment should be made on clinical grounds and selected cases transferred to neurosurgical units for further investigation including scanning and further management. This paper reviews

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TABLE I—Response to requests for computed tomography scanning of patients with head injuries: same hospital

Source of request	No of positive responses	No of scanners available	%
Neurosurgeons	36	36	100
General surgeons/physicians and neurosurgeons	36	36	100
General surgeons/physicians	23	38	61
Accident and emergency department surgeons	25	33	76

TABLE II—Response to requests for computed tomography scanners of patients with head injuries: other hospitals

Source of request	No of positive responses	No of scanners available	%
Neurosurgeons	26	36	72
General surgeons/physicians and neurosurgeons	34	37	92
General surgeons/physicians	19	38	50
Accident and emergency department surgeons	13	25	52

TABLE III—Availability of computed tomography scanning for patients with head injury by time and source of request

Availability by time	Source of request					
	Neurosurgeons		General surgeons/physicians		Accident and emergency department surgeons	
	No of hospitals (37)	%	No of hospitals (28)	%	No of hospitals (27)	%
24 hours every day	31	84	17	74	21	78
24 hours not every day	2	5	1	4	1	4
< 24 hours not every day	4	11	5	22	5	18

the existing pattern of availability of computed tomography scanning facilities for head injuries in England and Wales and attempts to draw conclusions as to the present orientation towards these two approaches to management.

Computed tomography scanning facilities

To establish the number of scanners, regional health authorities were asked to record the names of hospitals in their regions that had either head scanners, whole body scanners, or both, available to NHS patients in February 1981. Forty-two hospitals had either or both facilities. The use made of these facilities in the management of patients with acute head injury was studied by postal questionnaire to the senior neuroradiologist/radiologist in these hospitals. The questionnaire was in three sections. The first section concerned the response to the type of surgeon/physician making the request for scanning in either the same hospital as the scanning service or from another hospital. The second section concerned the time of availability of the scanning service. The third section concerning the need for interpretation of the scans by radiologists or neurosurgeons for patients referred by general or accident and emergency surgeons or general physicians before surgical intervention or transfer to a neurosurgical unit. Replies to the questionnaires were received from 39 of the hospitals.

RESPONSE TO REQUESTS BY SOURCE

Interest in this first section lies in the response made to requests for the investigation of patients when neurosurgeons are already concerned and those of similar diagnosis who are in the care of general surgeons/physicians or casualty surgeons. The responses have been broken down into those concerning patients in the same hospital as the scanner and those from patients in other hospitals (table I). There is a clear difference between requests from neurosurgeons and those arising from general surgeons/physicians and accident and emergency

departments, which suggests that scanning facilities are not used maximally as early diagnostic instruments, but only after referral to neurosurgeons. Six hospitals giving scanning facilities to accident and emergency departments do not respond to requests from general surgeons/physicians. This differentiation suggests that these hospitals may have a policy in which patients with head injuries are referred from accident and emergency departments directly to the care of neurosurgeons and not general surgeons/physicians.

The response to requests from staff in hospitals without scanning facilities is shown in table II. There is again a difference in response rate to requests that concern neurosurgeons and to those that do not. For the latter, only 50% of scanning facilities are available. Ten hospitals that give a facility for scanning to neurosurgeons caring for head injury in their own hospital do not give this facility to neurosurgeons with similar patients from other hospitals. In some instances this apparent lack of service may relate to the absence of other neurosurgeons working in the relevant catchment area. For patients with head injury not in the care of neurosurgeons, four hospitals that respond to requests from general surgeons/physicians in their own hospitals do not offer this service to similar staff in other hospitals. Twelve hospitals that make scanning facilities available to their own accident and emergency departments do not make this facility available

to these departments in other hospitals. Two hospitals with scanning facilities but without accident and emergency departments make available their scanning service to patients with head injuries from the accident and emergency department of other hospitals.

AVAILABILITY OF A SCANNING SERVICE BY TIME

The overall availability of the scanning services within the 39 hospitals is shown in table III. Most hospitals give a full service to neurosurgeons caring for patients with head injuries. In table III consideration has been given also to the availability of a scanning service to patients not yet in the care of neurosurgeons. For these latter patients the combined effect of the partial response to requests of hospitals with scanning facilities and their availability results in 17 out of the 39 hospitals with computed tomography scanners giving a continuous service to patients in the care of general surgeons/physicians and 21 out of 39 hospitals giving a similar service to surgeons in accident and emergency departments.

INTERPRETATION OF SCANS

This third part of the questionnaire applied only to patients with head injuries in the care of general surgeons/physicians and accident and emergency department surgeons when neurosurgeons had not yet been consulted. All scanning departments indicated that interpretation of the scans before transfer to neurosurgical care would be required from a radiologist or a neurosurgeon. Half the responses indicated that the interpretation would be made only by a radiologist. This exclusive undertaking will indicate the absence of neurosurgeons in some places.

Discussion

In the use of computed tomography scanning in the management of head injuries there appears to be a differential service that favours patients in the care or direction of neurosurgeons.

At the time of this study therefore it would appear that computed tomography facilities are being used mainly as an investigative management tool after selection or transfer to neurosurgeons has taken place after a clinical assessment. Around half the scanning facilities are available to aid diagnosis and management decisions for patients with head injuries not yet in the care of neurosurgeons. Possibly the radiologists making scanning facilities available believe that patients with head injuries in the care of neurosurgeons are more ill and are more likely to benefit from scanning than patients with a similar diagnosis in the care of general surgeons/physicians or accident and emergency department surgeons. The questionnaire did not attempt to establish this belief. Nor has it been possible to validate the fact that patients with head injuries do not vary in severity according to the type of surgeon/physician requesting computed tomography scanning. Some radiologists reported that computed tomography scanning facilities were available but were underused for such patients.

Computed tomography scanning has the potential to detect intracranial haematomas. Intracranial haematomas may be unassociated with clinical features other than a history of a blow to the head. Computed tomography scanning could be used for such patients as a primary screening instrument. More commonly, computed tomography scanning is considered as a secondary screening instrument for patients whose clinical features indicate the possible presence of an intracranial haematoma. Assuming effective treatment for intracranial haematomas that are located, the benefits of the primary and secondary screening approaches with computed tomography scanning will depend on the detection rate of intracranial haematomas and the cost of the service provision. It is accepted that computed tomography scanning is a valid instrument for diagnosing intracranial haematomas with low false-negative and false-positive rates. Considering the primary screening requirement, the number of patients without clinical features will be most common in accident and emergency departments and less frequently found in surgical wards or neurosurgical units. The overall incidence of intracranial haematomas in these patients is likely to be very low. In absolute numbers, most cases are likely to be found among accident and emergency department patients, but the cost per case detected will be high. In the more common situation of patients with clinical features suggesting possible intracranial haematoma the incidence of this lesion is likely to be highest in

neurosurgical units, and less in surgical or medical wards and accident and emergency departments, because of the selective influence of clinical screening and transfer of patients. Hence the cost per case detected is likely to be lowest in neurosurgical units and highest in wards and accident and emergency departments. The costs per case detected in wards and accident and emergency departments if secondary computed tomography scanning facilities became more widespread could rise or fall according to the effect of the existence of the facility on the validity and efficiency of clinical screening. If the costs of more widespread secondary screening by computed tomography scanning became acceptable it would be necessary to determine that provision of the service did not in fact alter the effectiveness of treatment—for example, by delaying treatment.

There is a limit to the interpretation that may be made from this postal questionnaire over the pattern of use of computed tomography scanners in managing head injury. To establish the effectiveness of early scanning after the presentation of head injury patients in comparison with clinical assessment and selective referral to neurosurgeons and subsequent change in mortality and morbidity requires a randomised intervention approach. This approach is made difficult by the large number of patients required to undertake successfully such a study. If the number of computed tomography scanners available to patients in the care of general surgeons/physicians or accident and emergency department surgeons increase it would be possible to audit the use of these scanners to determine the accuracy of clinical assessment of intracranial lesions and the association of different diagnoses with different courses of management and outcome. It would also be possible to estimate the relative costs.

I am grateful to the radiologists who responded to the questionnaire and to Mr Brian Cummins, consultant neurosurgeon at Frenchay Hospital, Bristol, for his helpful comments.

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If a person suffering from paroxysmal tachycardia complains of irregular heartbeat during some attacks—particularly if woken at night by the symptoms—does this suggest other disease? If not, what treatment is suggested?

Patients tend to be inaccurate in their assessment of heart rate during a tachyarrhythmia (usually underestimating the pulse frequency) but the distinction between regular and irregular attacks is generally reliable. The questioner implies that a patient without overt heart disease, accustomed to regular palpitation, now complains of episodes with an irregular heart beat; we can be reasonably confident that the new symptom does indicate a second rhythm disorder. Irregular palpitation at a rapid rate is usually caused by paroxysmal atrial fibrillation, whereas slow irregular palpitation is probably due to ventricular extrasystoles. The former is much more likely to wake a patient at night. One cannot offer a comprehensive list of causes of paroxysmal atrial fibrillation in a short answer, nor offer general advice about treatment, especially when clinical details are sparse. A patient with persistent symptoms from more than one rhythm disorder, or with atrial fibrillation and the least suspicion of underlying heart disease, certainly warrants specialist assessment even if the attacks are not incapacitating. Systemic disorders such as alcohol abuse and thyrotoxicosis should, however, be excluded. If a diagnosis of paroxysmal atrial fibrillation is confirmed cardiac glycosides will usually be included in the treatment, but the arrhythmia does tend to be refractory to simple treatment, and drug combinations or some of the newer antiarrhythmic agents sometimes have to be used.

Anticoagulation is also indicated in the presence of mitral valve disease.—D A CHAMBERLAIN, consultant cardiologist, Brighton.

Fingers and toes can be anaesthetised (for local surgical procedures) by injecting local anaesthetic at their base. What other specific points in the body can be anaesthetised locally by injecting the drug into a restricted area? For instance, what is the most convenient way of anaesthetising a part or whole of (a) the palm or (b) the sole of the foot?

With knowledge of the anatomy of the peripheral nervous system and its relevant surface markings it is possible to produce anaesthesia by injecting a local anaesthetic around the nerves. Many excellent textbooks illustrate the necessary techniques.^{1,2} The nerve supply of the palm is from the ulnar and median nerves with the radial nerves supplying some of the thumb. All three may be blocked by separate injections at the wrist.¹ It may be easier, however, to use either a Bier's block or a brachial plexus block. The sole of the foot is innervated by the sural nerve and the medial and lateral plantar branches of the tibial nerve. The nerves may be blocked at the ankle.¹—JOHN NORMAN, consultant anaesthetist, Southampton.

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