GUEST EDITORIAL

The minor head injury

'... nor none so mild that it can be neglected.'
Hippocrates

In a typical health district in the United Kingdom with a population of 200 000, approximately 4000 people will sustain some sort of injury to the head every year. Of these, 2500 will visit the local accident and emergency (A&E) department. Of these, 300 patients may be admitted for observation and 30 may well need to be transferred to a neurosurgical unit. Eight patients may be harbouring a potentially lethal intracranial haematoma. None should underestimate the burden of the Accident Service in identifying which eight of these 2500 patients require early surgery before signs of neurological deterioration develop, especially when it has already been shown that three quarters of those patients who had talked at some time between injury and death had a significant haematoma (Reilly *et al.*, 1975). When the management of head injuries was reviewed later in that decade in Merseyside (Jones & Jeffreys, 1981), it could be deduced that up to 700 deaths per year could occur nationally from undiagnosed, potentially operable lesions.

Fortunately, we now have guidelines to help us with this exercise in triage. The recommendations of 'a group of neurosurgeons' (1984) have been adopted as a code of good practice in nearly every health region in the country. Managerial guidelines, however protective they might appear, are only as good as the clinician identifying and interpreting the clinical and radiological features, and applying these to the advice.

Which neurological signs and symptoms are significant?

What do we mean by 'confusion' or 'depression of consciousness'?

How do we measure deterioration?

The (A&E) department with its large head-injury case load should provide the best environment to research the answers to such questions.

In attempting to determine the significant factors influencing complications and eventual outcome in patients selected for admission by the now established guidelines, a database of symptoms, signs and results of special investigations has been built and these have been submitted to statistical discriminant techniques (Georgiakodis, 1987). Georgiakodis found that the rank order of predictors for a haematoma is:

- (1) The presence of a midline shift
- (2) Impairment of conscious level on arrival at hospital
- (3) Pupillary abnormalities
- (4) A vault fracture
- (5) Changes in the pupillary signs

Although such a mathematical approach may seem alien to the diagnostically obsessive clinician the authors suggest that it would streamline our way of thinking about the head-injured patient.

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Many time-honoured and revered practices are challenged by this approach. The eliciting of the Babinski response has no value in head-injury diagnosis. If we wait for the classical stages of Hutchinson's pupils, we are recognizing a complication of the head injury far too late. Some of the early pupillary changes are difficult to elicit with accuracy: our ability to measure pupillary reaction being restricted to deciding whether the pupils react or are fixed (Pemberthy *et al.*, 1981). Pupil diameter may be assessed more objectively with a pupil gauge. Aides-memoire and recording forms are needed to concentrate our minds on the bare essentials of the head injury examination (Marsden & Price, 1987).

All A&E personnel need to be familiar with scales to record the measurement of level of response and should seriously consider the most appropriate monitoring technique. The Glasgow Coma Scale (GCS), (Teasdale & Jennett, 1974) is frequently quoted by examination candidates and in research papers but not so frequently referred to in clinical practice. Nurses may faithfully attempt to plot the patient's progress on the GCS but be unaware of its limitations. The original concept of the GCS was that of a preliminary assessment record of level of consciousness: in principle, not unlike that of the Apgar score for newborn infants. Popular though it is, it lacks the sensitivity needed for continuous monitoring of a patient's awareness of the environment. In 1979, nurses from two neurosurgical units analysed the sensitivities of the then described eight British scales of consciousness (Cranswick *et al.*, 1979). As a result of their findings, a 34-point scale examining seven areas of responsiveness was developed and is now in daily use in our units (Price & Marsden, 1982).

It has long been considered that impairment of consciousness in the presence of skull fracture is a strong predictor of haematoma risk (Mendelow *et al.*, 1983). Recently Masters *et al.* (1987) have confirmed the value of a skull radiograph by showing that there is a 64 times greater chance of a patient having an intracranial injury with a skull fracture than without. Not every head-injured patient requires a skull radiograph and Masters has attempted to identify a 'low-risk group' of patients with less than a one in two hundred chance of having a fracture. Unfortunately, that group includes patients with scalp haematomas, lacerations and contusions without reference to the mode of injury and degree of violence sustained.

The early detection of shift of the intracranial compartments would seem a sensible way to screen patients for developing haematoma. CT Scanning is not available in every district general hospital and it is not, in any way, an economical exercise to scan every patient at the time of the skull radiograph. Computerized ultrasound examination, however, is a relatively simple, non-invasive, inexpensive procedure which appears to be more sensitive and specific as a haematoma predictor than the presence or absence of a skull fracture.

Much more work has to be done on the 'minor head injury' and its considerations and its sequelae. The A&E department, with its vast numbers of patients with this condition, would seem the ideal testing ground for new ideas and carefully researched methods.

A. K. MARSDEN & D. J. PRICE

Departments of Accident and Emergency Medicine and Neurosurgery,
Pinderfields General Hospital,
Wakefield, England

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