

DOI: 10.21767/2171-6625.1000113

Practical Scale for the Management of Head Injured Patients in Coma or with Possible Multiple Injuries

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Abstract

Background: Aggressive total management of all patients with severe closed head injuries requires much effort and many resources. A clinical scale has been developed for assessing the depth and duration of impaired consciousness.

Method: A protocol for emergency triage of head injuries was presented. Its objectives were to increase the quality of clinical assistance, to avoid unnecessary emergency neurosurgical consultation and to reduce the inter-hospital transfer of patients.

Result: Emergency neurosurgical consultation was reduced by 80% in Grade 1 and by 85% in Grade II. Moreover, a significant reduction of Hospital readmissions was recorded 1vs 11 ($p = 0.01$).

Conclusion: This head injury chart enables every member of the staff in casualty to view the evolution of any patient at any given moment.

Keywords: Management of head injuries; Surgical emergencies; Head injury chart

Introduction

There is a wide variety as regards both the course and the type of intracranial lesion among patients with severe Head Injuries (H.I.). It is, therefore, necessary to separate these patients into meaningful subgroups in order to better analyze the factors influencing outcome [1-5].

In a recent multicenter [6] study in which a simplified head injury classification, including both the type and seriousness of injury was adopted, the type of intracranial lesion was seen to be an important factor in determining outcome, as was the severity of injury. Impaired consciousness is an expression of dysfunction in the brain as a whole. This may be due to agents acting diffusely, such as drugs or metabolic imbalance; or to the combination of remote and local effects produced by brain damage which was initially focal. Such focal brain damage may affect some of the responses which are used to assess the

level of consciousness, and any scale devised for general use must allow for this possibility [7].

A simple scale might suffice for metabolic or drug coma, when the likelihood of structural brain damage is small [8], but in an emergency there may be insufficient information to confidently assign patients to a specific diagnostic category. Moreover, coma of mixed origin is not uncommon, as is the case when head injury is suspected of being associated with the ingestion of drugs or alcohol, or with a vascular accident. These seem to be good reasons for devising a generally applicable scheme of assessment [9].

Clinical Materials and Methods

An average of 100 head injuries are seen in our casualty room every month. 15% of them have to be hospitalized due to real or presumptive neurological implications. The use of CT - Scan, the administration of the dosage of dexamethasone (16 mg IV at the moment of admission, 36 mg/day for four days, and its progressive gradual withdrawal) and the monitoring of ICP by epidural transducers have spectacularly changed the outcome of these patients [10].

But, as important as all of this has been, a standardized H.I. protocol chart that is comprehensive enough for casualty medical and nursing staff, as well as functional for fast assessment of the evolution of any head injury, is needed. We have modified a set of parameters for clinical evaluation included in the British Medical Journal protocol on H.I. 1984 [11].

The HI protocol chart is divided into six pages: The Rx and CT- Scan chart after recent H.I. (Page II); Observation chart (Page III) contains parameters related to the admission of adults to hospital and criteria for consultation with the neurosurgery unit; Criteria for ICP monitoring recent HI Chart (Page IV); Risk of cerebral hematoma chart in recent HI (Page V) [12]; Glasgow coma scale for recording assessment of consciousness (Page VI) [13] (Pages II-VI: supplementary file).

A protocol for emergency triage of head injury is included. Its objectives are to increase the quality of clinical assistance, to avoid unnecessary emergency neurosurgical consultation and to reduce the inter-hospital transfer of patients.

It is designed to be performed by the medical personnel (Senior House Officer Registrar) of the hospital emergency areas.

All patients are evaluated with clinical history, physical and neurological examination. If, due to the clinical evolution of H.I., the presence of an open wound is detected, or the CT demonstrates a surgical lesion, a patient needs surgery and he/she is operated on at once. All patients are then taken to the neurosurgical observation unit (H.D.U.) where the Glasgow observation coma chart is used. This chart is the Glasgow Observation Coma Chart of H.I. [13]. With this HI chart the evolution of any patient can be seen at any given moment by any member of the staff.

Our H.I. chart was retrospectively tested on 629 comparable patients admitted between 1994 - 1995 pre-H.I. chart and 522 cases admitted between 1995 - 1996 and was found to be accurate with no falsely pessimistic predictions.

Results

The results of the application of the protocol were presented together with its description and basis. Depending on the results, they were classified into one of a four-grade triage scale [14].

Grade 1 - Hospital discharge (Should be advised to return if there was any deterioration).

Grade 2 - Admission of adults to hospital.

Grade 3 - Emergency CT- Scan.

Grade 4 - Consultation with the Neurosurgeon or referral to our unit.

Patients classified as grade 2 were reclassified into grade 1 or 3 depending on the results of the CT-scan. Grade 2 after CT-scan was redefined as those patients requiring ICU admission without indication for emergency surgery.

There was an 80% reduction in Grade I and 85% in Grade II of emergency neurosurgical consultation, no complications without an appropriate neurosurgical consultation being detected [14-16].

On the contrary, a significant reduction of hospital readmissions was recorded. 1 vs. 11 ($p=0.01$).

Discussion

Apart from its practical use in the management of recently brain damage patients, this scale makes it possible to define the duration of coma more precisely. In terms of how long various levels of responsiveness have persisted different observers were able to obtain the responses in this scale with a high degree of consistency, and the likelihood of ambiguous results appearing to be small.

Systems for describing patients with impaired consciousness are not consistent [15,16]. Indeed, many clinicians retreat from any formal scheme in favor of a general description of

patient's state, without clear guidelines as to what to describe and how to describe it.

In practice, such unstructured observations commonly result in ambiguities and misunderstandings when information about patients is exchanged and when groups of patients treated by alternative methods are compared or reported from different centers.

Conclusion

There is no general agreement about what terms to use; that is in common use as interpreted similarly by different professionals. However, repeated observations of conscious level are usually made by relatively inexperienced junior doctors or nurses; this staff is not only few in number but also changes frequently during the course of the day.

There are, therefore, good reasons for restricting routine observations to the minimum and for choosing those which can be reliably recorded and understood by a range of different staff.

Our H.I. chart for the management of patients in coma or with possible multiple injuries showed this. After all, the aim of our study was for the scale to facilitate consultations between general and specialized units in cases of recent brain damage and to demonstrate that it was also useful in defining what and how to do.

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