

Head injury management guidelines for general practitioners

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ABSTRACT

A complete examination of a head injured patient in the hospital requires a number of instruments. These include a stethoscope, sphygmomanometer, ophthalmoscope, otoscope, cotton wool, safety pin, tuning fork, reflex hammer and a small key to test the plantar response. Few of these are required at the accident scene. This is because, in the hospital, the aim is optimal definitive treatment. At the accident scene, the aim is prevention of secondary injury, rapid recording of the most important findings and safe efficient transport to the hospital. This short paper reviews how the local doctor should undertake a neurosurgical assessment of traumatic brain injury patients. Moreover, the primary management at accident scenes is described and the rationale behind the approach is outlined

Key words: Head injury, guidelines, practitioners

Introduction

For the current purpose, head injuries are classified as serious or nonserious. The nonserious injuries make up, by far, the vast majority of all head injuries. Roughly speaking, in the USA, 1300/100,000 people suffer concussions each year. Of these, 300/100,000 are treated in emergency departments. Of these, 90/100,000 are retained in the hospital. Around 25/100,000 die.^[1] Thus, it is clear that the great majority of traumatic brain injuries (TBIs) run a benign course. However, the well known risk of epidural bleeding with delayed clinical deterioration and concomitant threat to life is known and is the basis for observation of minor head injuries overnight. This involves a considerable effort and expense for a condition which occurs in 0.83/100,000 per year. However, the common age is under 60 and, since the injury is in principle curable and occurs in younger patients, the extra effort is considered worthwhile.

Major head injuries are the subject of most of this account, and they are managed very differently. In the current context, the following definitions are as used. A major head injury is any TBI with a severe disturbance of consciousness and/or a focal neurological deficit. In a minor TBI, there is no loss of consciousness or loss of consciousness is limited to 10 min or less. The rationale behind the choice of instruments is summarized at the end of the paper. The advice found in this paper is based on the Norwegian model, where every attempt is made to send a qualified team by helicopter to the accident scene. This team will be led by an anesthetist who will make the initial management decisions, including the requirement for intubation and the number of intravenous lines to set up.

Minor Head Injuries

Cerebral injury

These can be divided into those who have lost consciousness and those who have not. For those who have not, the sensible course is to send them home to be cared for by their families. The patients will have a Glasgow Coma Scale (GCS) of 15.^[2] The GCS registers the verbal, motor and eye opening responses of the patient. A normal value is 15. These patients may be observed every few hours throughout the night. In the event of deterioration of any kind, the doctor should be recalled and hospital admission should be considered.

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Symptoms that deteriorate include increasing headache or vomiting, epilepsy and confusion. The GCS will be less than 15. The development of any of these symptoms with a concomitant fall in GCS constitutes ground for admission to hospital for observation.

For patients who have lost consciousness, a more cautious approach is needed. If the patient is wide awake, fully orientated and has no apparent loss of mental function or orientation, he/she can be managed in the same way as patients who have not lost consciousness. If the patient was unconscious for more than 10 min or has persisting severe headache or is disorientated and confused or if he/she has had an epileptic seizure, then he/she needs to be admitted to hospital for observation. These changes mean that the patient has crossed the border into the major head injury group.

Cranial injury

It is possible to acquire a skull fracture without a severe disturbance of consciousness. Patients bleeding from the nose or ears after a head injury are assumed to have a skull base fracture and should be referred to a hospital. Lacerations will require suturing. It should be remembered that the galea is sutured with interrupted inverted 2.0 dexon sutures and the skin is sutured with 2.0 or 3.0 nonabsorbable sutures. Skin adhesive strips are not suitable as bleeding occurs from vessels located between the skin and the galea, and they are controlled only if both layers are sutured. If the local practice has the equipment and is familiar with suturing, this may be done locally; otherwise, the patient should be sent to an emergency room.

The question arises as to the clinical diagnosis of a depressed fracture. In minor head injuries as defined above, the fracture will have been caused by a focal trauma. If this is not located over the motor area, it is more than possible that there will be no neurological deficit and the patient may not even have lost consciousness. When a hematoma feels soft, there may well be an underlying depressed fracture and the patient should be sent to the hospital for imaging. If there is a palpable dent under a skin contusion which feels like an impression, this is nearly always due to a hematoma under the pericranium with a localized margin but no depression. It will usually be associated with a linear fracture. Although the finding is usually not serious, imaging will still be required for the sake of safety.

Instruments required to assess minor head injuries

At the accident scene

1. Pen – with ink and a refill

2. A4 paper with clipboard to facilitate legible writing
3. Envelopes
4. A pen torch
5. Small key like a car key

At the home in the event of deterioration

1. Pen – with ink and a refill
2. A4 paper with clipboard to facilitate legible writing
3. Envelopes
4. A pen torch
5. Stethoscope
6. Sphygmomanometer
7. Ophthalmoscope
8. Otoscope

Major Head Injuries

Cerebral injury

The local doctor's role will be limited to the time from arrival at the accident scene to the arrival of the emergency ambulance team. The primary causes for concern are the airway and the circulation. Thereafter, the major concern is to avoid secondary injuries, such as would arise from careless movements of the neck in an unconscious person. The patient should be turned onto his/her side. If the chest is injured, the patient should lie on the injured side, ensuring the best oxygenation from the lung on the normal side. If a suitable stabilizing collar is available, it should be fixed to the patient before he/she is turned on to the side. In the absence of a collar, the head should be held so that it does not twist on the body as the patient is moved into the lateral position. This is because the neck is often injured and moving the head and shoulders is one of the safest ways to turn the patient.

The examination of the nervous system beyond registering the level of consciousness and loss of movements in a limb is not required and will not affect management. However, the GCS score forms a baseline for later comparison and helps to register deterioration. Before testing for asymmetry of movement, the limbs should be checked for injury since the pain of fractures or dislocations will result in a limb not moving even if there is no neurological deficit. The only requirement then is to observe the nature of movements in the four limbs to command or painful stimulus. (Finger pressure over the manubrium sternae.) Finally, the pupils should be examined for symmetry and response to light as abnormalities often reflect the development of tentorial herniation and this in turn affects the urgency of the situation.

Cranial injury

The only requirement is to cover any open wound to

maintain cleanliness as far as possible. Swabs are placed over open wounds and bandaged lightly or plastered in place according to what is practically possible.

Instruments required

At the accident scene:

1. Pen – with ink and a refill
2. A4 paper with clipboard to facilitate legible writing
3. Envelopes
4. A pen torch
5. Small key like a car key

Reasons for limiting the instruments used at the accident scene

A pen torch

This is essential for examining wounds at night or in dark locations. It is also necessary for the assessment of the pupils.

Stethoscope

This is of little use as the sounds from the environment, including passing vehicles, distressed relatives, animal noises on a farm and industrial noises at a factory, prevent satisfactory use of a stethoscope.

Sphygmomanometer

The application takes time. The stethoscope cannot be used with it. An adequate first aid assessment of the circulation can be made by measuring the pulse rate and force and observing the skin color and the amount of sweating.

Ophthalmoscope

This is virtually impossible to use at an accident scene. The patient will not cooperate. It will give NO information that will drastically affect the emergency treatment.

Otoscope

If there is no bleeding from the ears, there is no major otological problem. If there is bleeding from the ears, it will be impossible to obtain a clear view. Inserting a speculum into the ear for the purpose of otoscopy in principle could increase the risk of infection.

Cotton wool

Assessment of sensory loss in a patient with a diminished level of consciousness is unreliable and will not contribute to emergency management.

Safety pin

Assessment of sensory loss in a patient with a diminished level of consciousness is unreliable and will not contribute to emergency management.

Tuning fork

Assessment of sensory loss in a patient with a diminished

level of consciousness is unreliable and will not contribute to emergency management.

Reflex hammer

An assessment of the reflexes is difficult to perform in a patient lying on their side and is of secondary interest compared with findings of loss of movement in a limb. The reflex findings will not contribute to emergency management.

A small key to test the plantar response

This is useful and can be quickly, done and a change from flexor to extensor can be evidence of progressive herniation.

Conclusions

The local physician's duty at the accident scene where a serious head injury is a component of the injury is firstly to maintain the airway by turning the patient onto his/her side. Prior to turning the patient, a collar should be fixed to secure the neck. If this is not available, the patient is turned with head and shoulders moving as one and with the head supported in the lateral position. The next priority is, if possible, to set up an intravenous line.

The other major priority is to RECORD the findings as outlined above. They are the baselines with which future evaluations will be compared. For the receiving neurosurgeon, evidence of deterioration can make investigation and treatment far more urgent than in the case of a bad situation which is stable. The deterioration from a better state suggests that there is function that may be regained whereas a steady serious deficit suggests a greater degree of primary cerebral damage.

Thus, the paper, pen and clipboard to ensure clear writing, envelopes and a pen torch remain the essential equipment for the local physician who is first to arrive at the accident scene where major head injury is involved.

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