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Medi Quest BRS Hospital

A monthly News letter from BRS Hospital

Approach to a Patient with Head Injury

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Receiving patients of head injury can be traumatising for uninitiated health care workers. It is important therefore, to keep in mind certain things to ensure that all aspects of head injury and its complications are evaluated for clinically. This initial information or Primary Survey, can help in establishing prognosis and also aid the health care team in planning investigations and treatment.

Broadly, there are two categories of head injury patients that are encountered in emergency departments – patients who are conscious and patients who are unconscious.

Important history to ask in patients with Head Injury

Usually head injury patients are brought to the emergency by relatives or a group of bystanders. Very rarely are they brought in without anyone to give details about the circumstances of the injury. When possible, elicit these important details:

- What was the mode of injury?
- Was is associated with loss of consciousness? If so, was the loss of consciousness before or after the injury?
- Was there any involuntary movement like seizure which was associated with the injury?
- Was there any history of ear, nose or oral bleeding?

Examination Common to all head injury patients.

1. Identify the location of trauma. First aid must be done accordingly with wound cleaning, wash and sutures if necessary.

2. Blood pressure.

a. Low blood pressure can herald neurogenic shock or blood loss

b. High blood pressure can be an early sign of increased intracranial tension.

3. Heart rate

a. Tachycardia could be due to shock, fever, infection or pain

b. Bradycardia could be due to increased intracranial tension

4. Respiration. Irregular shallow respiration can point towards increased intracranial tension.

5. Temperature. Fever will help identify the presence of any infection.

6. Always check for neck rigidity.

7. Plantar reflex.

a. Unilateral Babinski's sign positive can help in localization.

b. Bilateral Babinski's sign is not as helpful in localization.

Examination of the Unconscious Patient.

These are the cases that cause the most amount of anxiety to healthcare workers and primary responders. Approaching an unconscious patient in a systematic manner and doing a head to toe primary survey can help in obtaining a lot of information.

1. **Eyes** – examination can help identify damage to the cranial nerves II and III and also help identify increased intra cranial tension.

a. Look for the direct light reflex. It can be normal, sluggish or absent.

b. Look for pupils of unequal size. Hutchinson's pupils can be a sign of intracranial pressure or irritation.

2. **Ear and nose**. Look for any bleeding or discharge. Can help identify base of skull fractures.

3. **Face**. – can help identify cranial nerve VII, IX, X, XI palsies.

a. A facial grimace can be elicited by giving a painful stimulus over the nasal septum or over the supraorbital area. This grimace can usually help in identifying facial palsy, if any.

b. Also look for loss of nasolabial folds and drooling of saliva.

c. If the jaw is loose, open the mouth and look for tongue bite. Also look for central uvula and if possible, elicit the gag reflex.

4. **Limbs**. Look for any focal neurological deficit. Hemiparesis is the most commonly seen deficit but monoparesis or quadriparesis can also be seen in rare cases. Painful stimuli like eternal pressure can usually elicit limb movements in unconscious patients.

5. Remember that the unconscious state is not always caused by the head injury itself. It maybe because of metabolic causes as well like post ictal states, hypoglycemia, dyselectrolytemia, uremia, hyperammonemia and infection. Its important to test for all of these once the primary survey is done.

Examination of the Conscious Patient

Conscious patients with head injury can present with a lot of red herrings. Because they are conscious, their pain will seem like their biggest problem and will distract from systematic head to toe examination. Its

important to calm the patient as much as possible and carry on with the primary survey.

All the examination points for unconscious patients apply for these patients. But these are some additional things to keep in mind.

1. **Eyes.**

a. Look for extra ocular movements. Restricted EOMs can help identify III, IV or VI cranial nerve palsy which can be used as localising signs.

2. **Face.**

a. Look for jaw opening and closing for trigeminal nerve integrity.

b. Identify any facial palsy.

c. Ask for any subjective hearing loss or ringing in the ears.

d. Look for any tongue deviation.

3. **Speech** – look for any slurring of speech or anomia.

4. **Limbs**. Identify any focal neurological deficit. In conscious patients this is considerably easier to do.

a. Early in the injury deep tendon reflexes maybe mute and non contributory.

b. But plantar reflexes may help in localisation.

Immediate Care Prior to Imaging

1. **Inj Pan and Inj Emeset**. Patients with head injury may have stress induced gastritis and in unconscious patients any vomiting may lead to aspiration. These drugs will act as a prophylactic measure

2. **Analgesics**. Inj Paracetamol (1g iv) or NSAIDs are safest in patients with head injury. Avoid opioid analgesics like Tramadol which may lead to respiratory depression.

3. **Antiepileptics**. If the patient is actively seizing, Inj Midazolam or Inj Lorazepam are the drugs of choice. But if the patient is not actively seizing, Inj Levitiracetam (1g IV stat) is the preferred drug.

Deciding on Imaging

- Remember that imaging is paramount in patients with head injury. Even if examination shows no positive clinical findings, some form of imaging must be done.
- The easiest to do and the most cost effective modality is CT brain plain.

This will help identify any fractures and any intracranial hemorrhages.

- MRI Brain with angiogram and venogram will help identify individual vessel pathologies, and Dural venous sinus obstructions and also will help quantify the extent of any cerebral edema. This is done as a follow up scan usually.

Management of Head Injury in the ICU

1. Nursing care

a. 30 degree head end elevation

b. Position change to prevent bed sore development

c. Eye care, oral care and physiotherapy

d. Ulcer prophylaxis with proton pump inhibitors

e. Pharmacological and mechanical deep vein thrombosis prophylaxis.

f. Can consider induced hypothermia in select cases.

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2. Respiratory care

a. Patients with a GCS of less than 8 should be considered for mechanical ventilation. This is used to prevent aspiration pneumonia, hypoxia, hypercapnea and reduce respiratory drive.

b. Etomidate and propofol are the premedications of choice for intubation.

c. The controlled mode (volume or pressure controlled) should be used in the initial phases

d. Apart from oxygenation, ensure that PaCO2 is approximately 35 mmHg

3. Cardiovascular care

a. Head injury, associated spine injury and the stress of intubation can put patients into sympathetic hyperactivity — may require beta blocker use.

b. Systemic hypo and hypertension can compromise cerebral perfusion pressure. Ensure that MAP >90 mmHg.

c. In cases of hypotension, avoid hypotonic fluids as they can worsen cerebral edema.

4. Sedation and Analgesia

a. The ideal sedatives and analgesics for patients of head injury should have rapid onset and offset, easy titration and predictable clearance.

b. The drugs that are recommended for patients with traumatic brain injury are fentanyl, propofol, midazolam or dexmedetomidine.

5. Seizure prophylaxis. — phenytoin and levetiracetam are both acceptable for seizure prophylaxis in post traumatic patients.

6. Management of Intracranial pressure

a. Elevated ICP is defined as ICP > 20 mm Hg.

b. Head end elevation

c. IV Mannitol 20% iv bolus or hypertonic (3% NS) can be used initially

d. Transient hyperventilation and barbiturates along with mechanical ventilation can be used in restless patients.

e. If ICP remains elevated despite medical management, surgical options maybe considered.

A note on steroids: Steroids have been shown to be associated with worse prognosis in patients with traumatic brain injury. So, it is important to stay away from empirical steroid therapy to manage increased intracranial pressure in head injurypatients.

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