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Risk Management Pitfalls For Severe Traumatic Brain Injury

1. **"The patient was in a car crash and had an obvious femur fracture. I didn't think he needed a point-of-care glucose, given the obvious trauma."** All patients with altered mental status must have point-of-care blood glucose testing. Hypoglycemia and hyperglycemia can cause altered mental status, and they are easily reversible with treatment. In patients with a severe TBI, hyperglycemia or hypoglycemia may worsen neurologic outcomes if it is not urgently addressed.

2. **"The patient smelled of alcohol and was obviously intoxicated."** Over 60% of all severe TBIs are complicated by alcohol or drug intoxication, which may worsen morbidity. Blood alcohol levels and urine toxicology screens may help prove concomitant intoxication, but based on available history and physical examination, a patient should be aggressively resuscitated for severe TBI.

3. **"I assumed her TBI took precedence and didn't realize she also had a cervical spine fracture."** All patients with a severe TBI should be assumed to have a concomitant spine injury until proven otherwise, and spinal immobilization should be maintained. A patient with a severe TBI will be clinically unreliable, and the forces to generate a severe TBI should be assumed to have been transmitted to the spine.

4. **"The CT was normal, so I didn't think she had a TBI."** Diffuse axonal injury often has a benign CT appearance, and it contributes significantly to the morbidity and mortality of severe TBI. Patients with diffuse axonal injury are especially susceptible to secondary injuries from hypotension and hypoxia and should be resuscitated aggressively, based on available history and the physical examination.

5. **"The patient had a GCS score of 13 when she arrived but then had a 3-minute generalized tonic-clonic seizure. Afterwards, she didn't return to her previous baseline, so I presumed she was just postictal."** If a patient does not return to the previous neurologic baseline after a seizure, be concerned about nonconvulsive status epilepticus or a worsening intracerebral process. Repeat a noncontrast head CT and work quickly to arrange electroencephalograph monitoring. The patient should be aggressively treated for potential status epilepticus, and other causes for neurologic deterioration should be investigated.

6. **"The patient had a stable GCS score of 10 an hour ago, but we just discovered he has a blown pupil."** TBI is a dynamic process, especially in the first 24 hours. These patients should be monitored closely, and the emergency clinician should anticipate deterioration and be prepared to intervene immediately.

7. **"The patient had a GCS score of 3, and the intern performed the intubation. It went well, but the postintubation blood gas showed a PaCO2 of 20 mm Hg."** Care must be taken to avoid routine or prophylactic hyperventilation. Monitor the respiratory rate, especially immediately postintubation when the patient is hand-bagged. The resultant vasoconstriction from lowering the PaCO2 can decrease cerebral blood volume and CPP, worsening secondary injuries.

8. **"The patient's blood pressure kept dropping to 80 mm Hg, and despite 4 L of normal saline, I couldn't keep him normotensive, so I started norepinephrine."** Over 60% of patients with a severe TBI have other occult traumatic injuries. A hemodynamically unstable patient should initially be assumed to be in hemorrhagic shock and the source of bleeding investigated. Even a single episode of hypotension can worsen neurologic morbidity and mortality.

9. **"The patient had a GCS score of 9, and the CT didn't look that bad, so I admitted him to our local community medical ICU."** Patients with a severe TBI should be managed with early collaboration with trauma surgery and neurosurgery. Special consideration should be given to managing these patients in a neurologic ICU by neurointensivists or intensivists with experience managing neurologic disorders and secondary injury after severe TBI.

10. **"I gave my patient lidocaine as an ICP pretreatment medication prior to intubation, but while I was waiting 3 minutes for it to circulate, her SpO2 kept dropping below 90% and she seemed to aspirate."** Prevention of hypoxia and hypotension are key in avoiding secondary injuries. Given the data on pretreatment to blunt ICP elevations prior to intubation, care should be taken to efficiently intubate the patient without hypoxia or hypotension, even at the expense of a pretreatment agent.

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