Risk Management Pitfalls in the Management of Pediatric Stroke

1. **"Stroke is an adult disease! This child was previously healthy; he can't be having a stroke."**
   Though stroke is uncommon in children, it does occur. Even previously healthy young children can experience stroke. A recent upper respiratory infection can increase the risk of stroke in an otherwise healthy child.

2. **"I obtained a CT scan instead of an MRI because it's too difficult to obtain an MRI in the ED, and it won't give me management-changing information."**
   Though CT scan may yield important diagnostic information, MRI is the preferred modality for pediatric stroke. MRI can better detail AIS and CSVT in addition to common stroke mimics. Delaying MRI delays definitive diagnosis, treatment, and possible prevention of future stroke.

3. **"This child's hemiparesis was likely Todd paralysis because he had a seizure prior to arrival."**
   Children with stroke can present with seizure. New-onset focal seizures, prolonged paralysis, other neurological deficits, or stroke risk factors should prompt evaluation for stroke.

4. **"The child presented with altered mental status, but there were no focal neurologic signs, so stroke was not on my differential diagnosis."**
   In the case of ischemic stroke, children are more likely than adults to present with nonfocal signs and symptoms (eg, altered mental status), making the diagnosis especially challenging. A high level of suspicion for stroke must be maintained.

5. **"This patient was last well 2 hours ago, and he has a PedNIHSS score of 10. The CT scan showed no hemorrhage, so I don't need to involve neurology prior to giving tPA."**
   While some specialists may recommend thrombolytics in pediatric AIS, emergency clinicians should never make this decision on their own. tPA may be reasonable in some situations under the guidance of a neurologist with experience treating pediatric stroke. Vascular imaging that demonstrates complete or partial occlusion of the vessel is required, in addition to other radiologic, laboratory, and clinical criteria. The safety and efficacy of thrombolytics in children have not been studied adequately.

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6. **"The patient was not moving his left arm as well as his right. He was complaining of a headache, so I thought he probably had a complex migraine."**
   The presence of a headache does not rule out stroke in a child. Complex migraines in children are more commonly associated with visual and sensory changes rather than weakness, and migraine should be a diagnosis of exclusion.

7. **"The patient had just came back from a CT scan when the lab called to report a critical glucose value of 20 g/dL."**
   It is important to check the point-of-care glucose level in any child with stroke-like symptoms, because hypoglycemia can cause focal neurological changes and is an easily reversible stroke mimic. Checking the glucose level before sending the child for a CT scan may save them from unnecessary radiation.

8. **"My patient with sickle cell disease had evidence of an ischemic stroke. Her hemoglobin was 8 g/dL, so I didn't think she needed a blood transfusion."**
   The treatment goal for AIS in patients with sickle cell disease is to increase the hemoglobin level to 10 to 11 g/dL via exchange transfusion. If the hemoglobin level is < 10 g/dL and exchange transfusion is not readily available, simple transfusion of red blood cells to a level of 10 g/dL is usually recommended.

9. **"I highly suspected stroke in my patient. I thought an MRI brain scan should be sufficient imaging."**
   Much of pediatric AIS is due to an arteriopathy. Obtaining vascular imaging with the initial imaging is helpful to immediately identify the cause of the patient's AIS and to inform treatment and prevention of future stroke. This is especially important if the patient is going to be sedated for the MRI, so the patient does not have to be sedated more than once.

10. **"I was concerned the patient had intracerebral hemorrhage, so I rushed him to the CT scanner before wasting time with IV placement or other resuscitation."**
    While it is important to rapidly diagnose and contact neurosurgery in the case of a hemorrhagic stroke, it is also important to prevent secondary brain injury from causes such as hypoxia or hypotension/hypertension. Interventions such as IV placement and supplemental oxygen or intubation should be performed to stabilize the patient prior to obtaining imaging.

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