PET Scan Anesthesia Protocol

Anesthesia Protocol
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Overview

This study involves injecting F-18 FDG and imaging 45 to 60 minutes post injection. Scans are performed to evaluate brain tumors, epilepsy, and brain perfusion patterns in children. An attenuation scan is then performed to correct for different tissue densities.

Criteria for Anesthesia

The criteria for which children may need anesthesia for a PET scan are similar to those of other lengthy procedures in pediatric remote locations: patients who are mentally impaired, young children who cannot cooperate or tolerate, and those who are claustrophobic. In short, any patient with characteristics that may interrupt or disrupt the PET scan should be considered for sedation or anesthesia.

Materials

Supplies


Drugs

F-18 FDG (fluorodeoxyglucose) 1-10 mCi.

Special considerations: F-18FDG is made first thing in the am. The tracer has 2-hour half-life. Many patients are scheduled for each day. If the first patient is delayed the tracer will decay to the point that the patient dose is too low. Injecting the child would be a miss administration. Therefore the patient or patients must be canceled.
The Procedure

Pre-anesthesia

- A registered pediatric nurse will record the pre-anesthesia vital signs (temperature, BP, SpO2, HR) of every child. The general health status should be evaluated and any abnormalities recorded and reported to the anesthesia team.

- Consent patient guardian and confirm patient identification.

- Complete and sign standard preassessment form.

- Talk, inform and reassure the patient and parents explaining the major aspects of GA or sedation.

- Confirm NPO status: patients should not eat or drink caloric-laden beverages for at least 4 h before injection. Hyperglycemia can result in poor uptake of FDG into tissues as the elevated blood glucose competes with FDG for transport into cells and a poor scan will result.

**General NPO rules:**

- Breast Milk 4 hrs
- Clear fluids 2 hrs (water or apple juice)
- Solids 6 hrs

Good IV access is essential for the injection of the tracer! If the patient comes to the PET suite with an IV catheter or is cooperative enough to allow awake venous cannulation, the tracer will be injected. If the patient can hold still for the next 45 minutes (time necessary to the uptake or F-18FDG), no anesthetics will be given to the patient. Monitor the patient and keep him/her in a dark and quiet room. At 45 minutes start anesthesia or sedation for the scanning (approx. 45 minutes). Most children do not arrive to the PET suite with an IV line in place, and dread the prospect of being stuck with a needle, hence inhalation induction should be performed first and venous cannulation and tracer injection after. This would add at least 45 minutes to anesthesia time, as the child remains sedated, while the uptake of F-18 FDG occurs.

Following PET scan prepare the patient for transport to recovery room. The child should be responsive to stimuli with stable vital signs and a patent airway.

In the recovery, the anesthesiologist transfers the patient to the care of pediatric nurse, gives the necessary report, confirms the child’s vital signs and documents them in the anesthesia chart.

The progress of recovery should be documented by the nurse with the use of a post-anesthesia scoring system along with regular recording of the vital signs. The patient meets the standard discharge criteria when:

Alert and oriented
Vital signs stable for 30 min
Minimal nausea and no vomiting
Ambulates with minimal assistance

When the child meets discharge criteria he/she will be discharged by the recovery nurse.
Parent should be instructed to bring the child to the emergency room if there are any concerns about the child’s health.

Anesthesia set-up:
- Anesthesia machine and appropriate ventilatory devices (for example, Jackson-Rees).
- Wall suction and suction apparatus.
- Pediatric anesthesia cart including: laryngoscopes, ETT, airways, LMA, and so on.
- Drugs for anesthesia and sedation.
- Emergency resuscitation drugs.

Monitor every patient as you would in the OR. Monitoring starts with anesthesia induction and ends in the recovery room when the child is fully awake. Patients scanned for seizures need EEG monitor attached just prior to the procedure, before or after anesthesia. This takes about 15-20 minutes.

Anesthetic technique:
1. Use short-acting drugs that allow smooth and rapid induction and emergence. Propofol is ideal. Sevoflurane is a good option.
2. Avoid ETT if possible. Many children can be managed with an oxygen mask or LMA with spontaneous breathing.
3. Suggested Propofol administration regimen: Bolus dose: 2-3 mg/kg. Continuous infusion at a rate of 75-150 mg/kg/min.