ANESTHESIA IN CHILDREN FOR PERFORMING MAGNETIC RESONANCE IMAGING

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Abstract: Objectives: Anesthesia for magnetic resonance imaging presents environmental features, features related to the procedures, patient, anesthetic technique, which I will present in my study. In about 23 patients, children, undergoing MRI examination, I will present; the scanner, the anesthesia machine, monitoring equipment, anesthesia protocols, efficiency and safety of the anesthesia technique. MRI procedures were performed in the Department of Radiology, with MRI scanner G.E. Sigma 1OT; Patients were aged between 6 months and 15 years, 11 male, 12 female; Glasgow score of patients between 6 and 15. The pathology taken in study was neurologic. We used compatible anesthesia machine: Datex Ohmeda Aestiva/5MRI. Anesthesia technique: general anesthesia with OTI; Children with cranio cerebral diseases, require for MRI, general anesthesia with OTI. General anesthesia with OTI is safer and efficient. Complications were within the literature. Anesthesia was performed in collaboration with the radiological team.

Keywords: anesthesia features, anesthetic technique

INTRODUCTION

Anesthesia for MRI has features, in addition to those of anesthesia given in outside the operating rooms, including: (6)

- The examination technique, namely the scanner, which generates the magnetic field, noise, heat, ventilation, the cooling systems, and other malfunctions;
- Anesthesia machine, and the equipments for monitoring and resuscitation, which if are not “compatible”, may generate malfunctions;
- The procedure itself, isolation from ICU, the position of the patient in the scanner, discomfort, the lack of visibility, limited space for surveillance, monitoring and difficulty to perform resuscitation maneuvers;
- High anesthetic risk level especially for the emergency procedures;
- Technique of deep sedation/general anesthesia used;

In the context of our experience in anesthesia outside the operating room (10), I will present in the following, my observations related to the features of anesthesia for MRI

OBJECTIVES

Anesthesia for magnetic resonance imaging presents environmental features, features related to the procedures, patient, anesthetic technique, which I will present in my study.

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axonal injury in 5 patients. And 8 patients were without comorbidity.

- From the protocol of anesthesia used by us, I will mention that 12 of the patients
- were hospitalized in the pediatric surgery clinic, in the morning of the procedure, they were examined, evaluated and prepared for anesthesia. The anesthesia induction was made in the operating room with inhalatory induction using sevorenane 8 %, than we assemble a peripheral venous line. We administrated atropine 0,01 mg/bw, midazolam 0,3 mg/bw, propofol 1,5 mg/bw, fentanyl 0,03 mg/bw, rocuronium 0,4 mg/bw, and we performed orotracheal intubation. For maintaining the anesthesia we assemble propofol in continuous endovenous perfusion 6 mg/bw/hour. We transport the patient intubated, mechanical ventilated, continuous sedated and monitored in conformity with standards (EKG, pulsoximetry and blood pressure), in the MRI location where we transfer the patient on the scanner. Anesthesia is maintained intraprocedural with sevorenane 1,2 MAC from a Datex Ohmeda compatible anesthesia machine, and monitoring is assured with EKG and pulsoximetry with compatible monitoring equipment. After the procedure the patient is transported back to the operating room, intubated, mechanical ventilated and continuous sedated with propofol. We extubate the patient in the operatory room, and we supervise the patient in PACU (Postanesthesia Care Unit) for 6 hours. When the discharge criteria are achieved we transfer the patients at the origin clinics or let them go home. 6 patients from ICU, already intubated in conformity with their clinical status were transported intubated, mechanical ventilated and continuous sedated, in the MRI location transferred on Datex Ohmeda anesthesia machine with sevorenane 1,2 MAC; after the procedure, they returned in the intensive care unit remained sedated and mechanical ventilated with Evita 4 ventilation machine.

Discussions

- Deep sedation/general anesthesia is the election anesthesia technique, for children with MRI investigation (13,14,16,17,18,19) adapted at our conditions.
- Advers reactions/complications in 0,7% cases (18) at 2 patients, one with desaturation and other with psychomotor agitation at awakening, shows that this technique is safe and efficient, every investigation was completed without problems. (7,11,12).
- The management of anesthesia technique, must apply to the anesthesia standards, more so the patient is transported in a different location, far away from the intensive care unit, transferred into the scanner, who represents a “suigerenis “place, (isolated, noise, heat, radiations) where is difficult to observe the patient, to monitorize or do resuscitation maneuvers.
- Anesthesia techniques, most common used in the literature for MRI (3) are: propofol/ketamine (4,5,18,19), pentobarbital/midazolam/fentanyl (9,15), midazolam/ketamine (8,9,18,19), halogenates anesthesia agents: sevorenane (9,19), or cloralhydrate (9,19).
- The most common complications are: nausea, vomiting, desaturation, psychomotor agitation, allergic reaction, sedation failure, prolonged drowsiness confusion (7,11,12).
- The management of anesthesia for MRI respects the internationals recommendations
- and standards (1,18,19), and SRATI recomandations.

Conclusions

- Anesthesia for children - subjects for MRI investigations must be efficient for the procedure and safe for the patient safety similar to the anesthesia in the operating room
- Deep sedation/general anesthesia is of choice for MRI in children with neurological problems
- Features related to the environment, transportation, location, procedure itself, the inherent risks (attraction of ferromagnetic objects, claustrophobia, difficult access to the patient in case of accidents: accidental exubation, paravenous administration, low temperature, noise, limited space for reaction in case of complications, anesthesia machine monitoring and resuscitating equipment compatible), requires organisatoric measures, very well trained and experienced anesthesia team, and also a very good collaboration with the radiology specialists
- Complications in general in our study in particular were in small percentage 0,7 %.
- Althought we have ideal conditions of work, we tried to align at the national and international standards for the anesthesia outside the operating room, with competitive results.

Bibliography

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