

Endovenous Dexmedetomidine in Pediatric Patient with Autism Spectrum Disorder Undergoing General Anesthesia

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To the Editor,

Children with Autism Spectrum Disorder (ASD) are a heterogeneous group and often need general anesthesia for different procedures and studies. They present with abnormal development in social interaction, communication and stereotyped patterns of behavior and may be more prone to elevated perioperative anxiety. Familiarity with each patient's behavioral specifics and efforts to alleviate stress is of paramount importance for a smooth perioperative course with minimal events. The perioperative experience for these patients is complex and presents a unique challenge for clinicians. The main targets of these patients are rapid recovery, smooth postoperative pain, early discharge and low stress during the perioperative period [1]. There appears to be little literature in paediatric anaesthetic practice relevant to children suffering with autism. Recent findings suggest a need for rigorous study of the potential problems that autistic children may have when undergoing an anaesthetic.

Dexmedetomidine a specific α -2 agonist, approved only for sedation in adult intensive care patients, is increasingly used off-label in- and outside Europe in the pediatric setting for various indications such as to prevent agitation, as premedication in the form of intranasal, buccal and oral solution, as adjunct for elective surgery, as sedative for Magnetic Resonance Imaging (MRI) as intraoperative analgesia and as adjuvant to ropi- and bupivacaine for nerve blocks. DEX is also used IV at different intensive care units with the purpose of sedation of children.

Recent studies demonstrates that patient anxiety is effectively relieved by administration of intranasal DEX prior to general anesthesia, and that this does not induce respiratory depression, which is one of the most severe adverse effects of other sedatives. Intranasal DEX (1 μ g/kg) and midazolam (0,2 mg/Kg) were demonstrated to be equally effective in decreasing

anxiety at parental separation; however, Akin A. et al, revealed that midazolam was superior in terms of providing satisfactory conditions during mask induction [2].

DEX has intraoperatively been compared with fentanyl, for the reduction of postoperative opioid consumption and agitation after sevoflurane anesthesia. A significant reduction in the postoperative need for opioids, the incidence and duration of severe agitation, fewer desaturations episodes and a shorter time to extubation are also some of the other reported benefits [3].

There are no published articles that describe the perioperative use of continuous infusion DEX, in children with ASD, undergoing general anesthesia for a scheduled surgical procedure.

We describe the administration of this drug during the intraoperative period (bolus plus continuous infusion) and then in the recovery unit, in a 10 year old patient with ASD scheduled for surgery of several tooth extractions, preserving hemodynamic stability, without respiratory complications and absence of emergence delirium what made possible the discharge home the same day of the surgery.

A 10-year-old male child (52 -kg weight) was scheduled to performing four premolar extractions. Diagnosis of ASD at 2 years and intellectual disability. He presents learning disability and sleep disorders, repetitive patterns of behaviour and irritability. Currently the patient goes to Cognitive Behavioral Therapy with good response. No other medical diagnosis is recorded in your medical history. He has received previous anesthetics for RMI (midazolam, propofol and sevoflurane), highlighting episodes of psychomotor agitation and bronchospasm that requires intravenous treatment for 24 hours. After thoroughly reviewing the case, we informed the parents of the strategy for anesthesia.

Anesthesia plan

- premedication with midazolam VO (0.5 mg / kg) he arrives at the operating room accompanied by his mother, quiet.
- standard monitoring and mask induction with Sevoflurane, Fentanyl and Rocuronium.

- c) below: DEX Ev bolus of 0.5 μ / kg plus followed by 0.3 μ / kg / H, preserving hemodynamic stability without any adverse cardiological event.
- d) anesthesia was maintained with Remifentanil ev (0.05- 1.3 μ gr / Kg / min), Sevoflurane CAM 1 and Oxigen 0,4%.
- e) 15 minutes before the end of surgery, we reduced DEX ev to 0.1 μ gr / Kg / H.
- f) the extubation occurs successfully, maintaining in the Recovery Unit the infusion for 30 minutes, with hemodynamic data in the range of normality.

When we talk about children with autism, DEX and anesthesia, most of the recent works deal with the use of EV dexmedetomidine for sedation in procedures as MRI , most of them agree to administer 1- 2 μ g / kg IV for 10 minutes followed by an infusion 0,5- 1 μ g / kg / H [4-8].

Abulebda K. et al, compared the efficacy and safety of DEX to propofol in sedating autistic patients undergoing MRI and concluded that recovery and discharge times were significantly in the propofol group, while the DEX group maintained more stable hemodynamics [7]. Ray T. et al, demonstrated the efficacy of DEX in providing sedation during electroencephalographic (EEG) analysis in children with autism and similars doses that others colleges. Fewer changes in EEG amplitude and peak frequency were recorded after DEX (doses: 0,76 μ g/kg) vs midazolam (doses: 0,38 mg/kg) sedation [8].

Other studies described, as Kim *et al*, that intraoperative continuous infusion of low-dose DEX (0,2 microg/kg/H) was able to reduce Emergence Agitation (EA) following desflurane anesthesia without hemodynamic compromise or delayed awakening in pediatric patients undergoing strabismus surgery [9].

The doses used with our child seem very adequate and we have not observed any adverse effects from the drug, nor have psychomotor agitation or episodes of hypoxemia.

There is very little data in the literature about the use of DEX (effective consensus doses without adverse effects) in children with ASD undergoing anesthesia. After a thorough literature review, we think that this may be the first written case of ASD in pediatric anaesthesia and DEX ev (intra- and post-operative) allowing a reduced recovery time and discharge home without complications.

DEX is a recent friend who seems very effective to prevent agitation and reduction of postoperative anxiety between others, but there are many things to prove to call him friend with total security (the literature is reduced and the doses variable) so, despite rising application of this drug, there is an urgent need for large high quality randomized trials among children [10-12].

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