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Alternative for pre-anesthetic sedation and for surgical procedures in children: use of intranasal midazolam

Agitated and uncooperative children are frequently a challenge for safe anesthetic induction or urgent surgical procedures in emergency departments. Promoting anxiolysis and light sedation facilitates the performance of such procedures, reducing the adverse effects and increasing parents' and health care team's satisfaction. In a recently published study by Kawanda et al.,¹ intranasal midazolam was used at a dose of 0.5 mg/kg in 52 children submitted to 85 clinical and surgical procedures; the control group consisted of 28 children who were submitted to 55 procedures with no pre-anesthetic medication. As clinical outcomes, patients' behavior and sedation level were evaluated, along with ease of performing surgical procedure, which has been evaluated by the surgeon. For both clinical outcomes, there was a statistically significant difference among children's behavior and degree of agitation, as well as ease of finishing the procedure in previously medicated children, when compared to the control group.

Sedation for pediatric surgical procedures by non-invasive pathways can favor their performance, considering that there is no need for venous access, which is safe for light and moderate degrees of sedation. Midazolam is a water-soluble benzodiazepinic drug, effective for reaching such degrees of sedation in doses that vary from 0.3 to 0.5 mg/kg;² the intranasal pathway was shown to be effective in obtaining drug levels in the subarachnoid space similar to those found after intravenous administration, due to the presence of a rich vascular plexus that freely communicates with the aforementioned space through the olfactory nerve.³ Intranasal midazolam has already been studied in the context of sutures, peripheral venipunctures, and echocardiograms, with no occurrence of adverse respiratory and cardiovascular events, and with a high success rate in surgical procedures.^{4,5} It has been recently studied as a pre-anesthetic medication;⁵ data similar to those from the study presented demonstrate the tendency for obtaining good results by administering the drug, which has been gaining prominence for sedation in surgical procedures with children.

Some problems related to the administration of midazolam are well-known. The medication is kept in benzyl-alcohol, which guarantees a PH level close to three, which is uncomfortable and causes nasal burning. In order to mitigate such discomfort, two measures can be taken: administration

of the drug with an atomizer specific for the nasal mucosa, which disperses the liquid into droplets, ensuring absorption only by the nasal mucosa, and reducing the volume of the assimilated drug; and the concomitant administration of lidocaine, as described by Chiaretti et al.,³ which besides mitigating the discomfort, also appears not to interfere with the drug action. Another relevant aspect is the drug dilution. Midazolam administered by nasal pathway is the same parenteral solution of 5 mg/mL. Such a dilution requires high volumes of drug depending on the child's weight; the higher the volume administered by nasal pathway, the higher the percentage assimilated, with probable reduction in the effect.

It should be emphasized that midazolam may also be used as a mouth spray. The absorption by oral mucosa seems to be as effective as by nasal pathway, with similar results in improving pre-surgical anxiolysis.⁴ More recent options are being studied for intranasal administration, such as dexmedetomidine,⁶ a potent alpha-2 adrenergic agonist, which has the benefit of inducing a sleep state similar to the physiological state, and presenting few adverse events when compared to the parenteral pathway.

The higher success rates for sedation using this agent, associated with the lower doses needed for nasal administration by dilution and the profile of few adverse events make it an interesting option for surgical sedation for , although it is still in an initial stage of studies on the pediatric population.

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