

Premedication in children: what if it fails?

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Introduction

At least 60% to 70% of paediatric patients experience anxiety before surgery [1,2]. Preoperative anxiety in children is associated with adverse clinical (emergence delirium and increased analgesic requirements) and behavioural outcomes (sleep disturbances and enuresis) [2]. In addition, some children remain anxious for up to 14 days after surgery. Maladaptive behavioural changes, such as general anxiety, night crying, apathy, and temper tantrums, may last even longer [2]. Severe preoperative anxiety activates the stress response, resulting in significantly elevated cortisol levels and susceptibility to postoperative infections [3]. The aim of this short communication is to present crisis intervention techniques used by fire service crisis interventionists when working with children at the scene of tragic events. These techniques can also be effective in the operating theatre to calm the paediatric patient and gain cooperation for induction of general anaesthesia. However, the effectiveness of these interventions in anaesthesia has not yet been evaluated in clinical trials, and the information presented here is based solely on the authors' personal experience.

Preventive measures against preoperative anxiety in children

There are three main preoperative modalities to reduce anxiety in children: 1) behavioural preparation such as preoperative visits to the operating theatre, games, and various distraction techniques; 2) parental presence during induction of anaesthesia (PPIA); 3) anxiolytic premedication [2].

Non-pharmacological techniques should be preferred for all paediatric patients, consisting of preoperative education, games, and distraction techniques. Web-based preparatory programmes can be used to educate children and their parents about all perioperative procedures, such as the Anaesthesia Web (available at www.anaesthesiaweb.org) which provides clear and age-appropriate information. Another option is a preoperative visit to the operating theatre, either in real or virtual reality. However, the use of these techniques is not feasible in many institutions, and they also

fail in very anxious children, especially those under 4 years of age and those with certain temperamental characteristics [4].

Although most parents prefer PPIA to reduce their child's preoperative anxiety, current evidence suggests that the effectiveness of this procedure is questionable. In addition, PPIA always causes some degree of disruption to the operating theatre routine, increases pressure on anaesthetists, and usually requires additional staff to supervise parents. On the other hand, PPIA increases parents' satisfaction with the perioperative process and respects their rights as well as those of their children [2].

Despite some shortcomings, pharmacological premedication remains the most effective method of preventing preoperative anxiety in children. Inappropriate dose, route, or time of administration are the most common reasons for failure of pharmacological premedication [2]. Midazolam, the most commonly used agent for sedative premedication in children, fails to achieve adequate quality of sedation in up to 20% of cases. Another option for premedication is the administration of the selective α_2 -adrenergic receptor agonists dexmedetomidine or clonidine which have sedative and anxiolytic effects comparable to midazolam. Some authors prefer the use of ketamine [2]. An algorithm for managing preoperative anxiety in children is shown in Fig. 1. If premedication fails in a child with vascular access, the desired level of sedation and anxiolysis can be achieved pharmacologically (intranasal or intramuscular administration is also possible), or induction of general anaesthesia can be started immediately.

Pathophysiology of stress response in the brain

Severe stress in the child leads to an activation of the archicortex, which is located mainly in the hippocampus and is functionally involved in the limbic system. In the most severe cases, the child experiences tonic immobility (TI), also known in the literature as the freezing response, in which the paleocortex is particularly active [6]. TI is induced in the event of imminent threat and is characterised by a reversible, profound state

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