

Article

Use of General Anesthesia in Pediatric Dental Treatment

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Abstract: The highest degree of fear—dentophobia—can develop in childhood and persist throughout life. Emotional stress experienced during a dental visit leads to changes in physiological and biochemical processes in the body, which may result in psychovegetative disorders such as tachycardia, arterial hypertension, syncope, collapse, or psychogenic shock.

Keywords: dental treatment, general anesthesia

Introduction

One of the pressing issues in dentistry is managing pain, fear, and anxiety in patients. In the scientific literature, there is no clear distinction between the concepts of “dental fear” and “dental anxiety,” so the combined term “dental fear and anxiety” (DFA) is often used. Studies have shown that the prevalence of DFA ranges from 10% to 20%, and it is especially common in childhood. DFA is one of the main reasons for refusal of dental treatment [1], [2]. In severe cases, fear can escalate into a state of affect, which completely prevents treatment and may trigger medical emergencies [3], [4].

Additionally, some children have special healthcare needs, such as communication difficulties, mental disorders, mobility limitations, behavioral disorders, and chronic illnesses, which require specialized therapeutic interventions and behavioral management techniques to perform dental procedures safely [5]. Providing high-quality dental care for children with DFA and special healthcare

needs is challenging. Such treatment often requires considerable time, may result in dissatisfaction from dentists and parents, and in some cases, appointments are canceled.

Currently, general anesthesia is used as a treatment method for children when other approaches fail to achieve acceptable results. One of the preferred agents for pediatric dental anesthesia is propofol, an ultra-short-acting intravenous hypnotic. Advantages of using propofol in pediatric dentistry include:

1. Rapid onset—effects occur within 1–1.5 minutes after administration;
2. Safety and minimal risk of side effects or allergic reactions;
3. Suitable for use from 1 month of age;
4. Convenient administration via intravenous infusion under continuous anesthesiologist supervision;
5. Absolute comfort—the child sleeps during the procedure and wakes easily afterward with minimal discomfort [6].

This allows all complex and painful procedures to be completed in a single visit, avoiding pain.

Objective of the study: To analyze the reasons for performing dental treatment in children under general anesthesia [7].

Materials and Methods

The study was conducted at a privately owned dental clinic in Vitebsk. Participants were divided into two groups: the first group (54 individuals) consisted of parents of children who received general anesthesia during outpatient dental treatment, selected randomly. The second group (6 individuals) included the clinic's dental specialists, who recorded the reasons for administering general anesthesia for each of the 54 patients [8], [9].

A questionnaire was developed for parents, consisting of two sections: general information and reasons for choosing anesthesia. General information included the child's age, sex, parents' education level, home address, number of family members, and total number of previous general anesthesia procedures.

Questionnaires for dental specialists included only questions regarding the reasons for choosing general anesthesia. For the analysis, nine potential reasons for performing dental treatment in children under general anesthesia were proposed:

1. Age;
2. Lack of cooperation with the dentist during previous dental treatment;
3. Large volume of dental intervention;
4. Child's systemic disease;
5. Parents' unwillingness to implement behavioral management techniques;
6. Higher quality of work under general anesthesia;
7. Child's mental or physical behavioral problems;
8. Reduction in the number of treatment sessions;
9. Financial benefit for the dental clinic.

It should be noted that both parents and specialists could provide more than one reason for choosing general anesthesia for a child. The collected data were analyzed using descriptive statistical methods.

Result and Discussions

The age range of children included in the study was 2–11 years, with a mean age of 4.9 years. Of the patients, 56% (30) were male and 44% (24) female. Among parents, 64% (35) had higher education, 23% (12) had vocational or specialized secondary education, and the remaining 13% had technical or general secondary education. Regarding residence, 79% (43) of participating families lived in Vitebsk, while 21% (11) lived in other localities. Family size distribution was 2 members (3%), 3 members (50%), 4 members (39%), and 5 members (8%). Among the children, 53 (98%) had no prior history of general anesthesia [10], [11], [12].

From the parents' perspective, the most significant reasons for using general anesthesia were: age, indicating immaturity — 74% (40); lack of cooperation during previous dental treatments — 47% (25); and large volume of intervention — 35% (19). Less significant reasons included: higher quality of work under anesthesia — 12% (6), reduction in the number of treatment sessions — 12% (6), and parents' unwillingness to apply behavioral management techniques — 9% (5). Only 7% (4) of parents cited the child's systemic disease, and 5% (3) cited mental or physical behavioral problems. According to parents, financial benefit for the clinic was not a reason for using general anesthesia in pediatric dental treatment [13], [14], [15].

According to the dentists, the most important reasons for performing general anesthesia in pediatric dentistry were: age — 35 (64%), large volume of intervention — 35 (64%), and lack of cooperation during previous dental treatment — 27 (49%). Thirteen responses (24%) indicated that higher quality of work under anesthesia was a reason for using general anesthesia in outpatient pediatric dentistry. In 8 cases (14%), dentists considered parents' unwillingness to implement behavioral management techniques a reason; in 5 cases (9%), child behavioral problems; and in 4 cases (6%), systemic disease of the child (Table 2).

The results comparing parents' and dentists' responses regarding children treated under general anesthesia are presented in Table 3. According to the combined opinion of parents and dentists, the main reasons for using general anesthesia in pediatric dental practice were: age (57%), lack of cooperation during previous dental visits (32%), large volume of intervention (26%), child's systemic disease (7%), parents' unwillingness to implement behavioral management techniques (6%), higher quality of work under anesthesia (4%), child behavioral problems (4%), and reduction in the number of treatment sessions (1%) [16], [17].

There are various methods for managing a patient's emotional state during dental treatment, which include the use of sedative and hypnotic medications, behavioral management techniques, and their combinations. While these methods are applicable in many situations, each has limitations. Behavioral management techniques may be ineffective in cases of high anxiety, and pharmacological methods can carry potential risks. In some cases, due to the large volume of dental procedures required by the child and difficulties in controlling behavior, achieving cooperation with the dentist may not be possible. In such situations, general anesthesia may become the only option to ensure safe and effective dental treatment [17], [18], [19].

In their article, Escanilla-Casal et al. (2016) note that although complications can occur after general anesthesia, it is recommended under certain circumstances, such as lack of cooperation from the child [5]. J.H. Nunn et al. (1995) also list indications for pediatric dental treatment under general anesthesia, including behavioral management problems, comorbid somatic diseases, high anxiety, and long distances from dental care facilities [4]. Gharavi and Soltani (2008) found that dentists recommend general anesthesia in situations where children refuse to cooperate or have disabilities, provided that preoperative assessments are acceptable, with low risk and predictably preventable complications [6].

As a result of this study, 57% of parents and specialists agreed that the patient's age, reflecting the child's psychological immaturity, is a primary reason for choosing general anesthesia. Another key reason, in addition to age, is lack of cooperation during dental treatment, which in this study was a shared opinion of parents and dentists in 32% of cases. A large volume of necessary dental procedures alone is not a compelling reason for general anesthesia, but factors such as long distances from the child's residence to the dental clinic may influence its selection. The combined opinion of parents and specialists in favor of general anesthesia due to the volume of procedures occurred significantly less frequently than for the two previously mentioned reasons [20], [21], [22].

In this study, specialists cited physical, mental, and behavioral problems in the child as reasons for choosing general anesthesia in 5 cases, whereas parents did not identify this factor. This discrepancy may be due to parents underreporting or not recognizing their child's problems. Long distances to the clinic and the goal of reducing the number of treatment sessions were not mentioned by parents or specialists as primary reasons for using general anesthesia in 48 patients.

Neither parents nor specialists considered financial gain for the clinic to be a significant reason for performing dental treatment under general anesthesia, indicating an appropriate understanding of the objective reasons for its use in pediatric outpatient dental practice.

Conclusion

Based on the results and their analysis, the main reasons for choosing general anesthesia for pediatric dental treatment, from the perspectives of parents and dentists, are: age (reflecting the immaturity of the child), lack of cooperation during dental treatment, large volume of intervention, presence of systemic disease, parents' unwillingness to implement behavioral management techniques, higher quality of work under anesthesia, child's mental and physical behavioral problems, and reduction in the number of treatment sessions. The most frequently cited reasons by both parents and dentists were: age, lack of cooperation, and the large volume of planned dental procedures. The areas with the least agreement between dentists' "for" responses and parents' "against" responses concerned the large volume of planned dental interventions and the quality of dental work.

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