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Pharmacological Sedation - Boon To Pediatric Dentistry: A Questionnaire Survey

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Abstract

Background: Sedative drugs serve as the method of pharmacological behaviour management to deliver high-quality, pain-free dental care. Various sedative agents and combinations have been used to reduce anxiety associated with pediatric dentistry but no single sedative agent has achieved universal acceptance. So to determine the usage of sedative drugs, this questionnaire survey was carried out.

Aim: To assess the opinions of pediatric dentists and post-graduates regarding sedation based on their knowledge or clinical experience.

Methodology: A pre-designed, pre-tested questionnaire form was framed regarding the commonly used sedative drugs, preferred route of administration, behaviour management, commonly used combination, parental acceptance, and common complications encountered and it had been circulated among various pediatric dentists and pediatric dental post-graduate students.

Result: The results showed the usage of various types of sedative drugs, their preferred route of administration, parental acceptance and complications encountered.

Conclusion: Sedative drugs can be used as pharmacological behaviour management techniques and simultaneously increase the efficacy and quality of treatment.

Keywords: Conscious sedation, Midazolam, Nitrous oxide, Pharmacological behaviour management

Introduction

The most challenging task in the pediatric dental office is the management of children as they exhibit extreme fear and anxiety toward dental procedures.[1] The prevalence of dental anxiety ranges between 3% - 43% worldwide.[2] Simultaneously this fear and anxiety can lead to avoidance of the treatment resulting in dental neglect.

The main goal of pediatric dentistry is to provide atraumatic treatment experience to a child and simultaneously manage the behaviour of the child.

Though conventional behaviour management methods can manage a majority of child patients many still require pharmacological intervention.[3] These agents help in achieving a calm and relaxed patients who are able to protect their open airway, support their own ventilation, and also respond to verbal commands.[4] Ideally, the choice of sedation technique depends on the patient's needs but as the commonly used sedative agents can be administered together or alone, through different routes and dosages in pediatric patients, it can be sometimes difficult for the dentist to decide the best technique and the ideal sedative.[5]

The various pharmacological agents used in pediatric dentistry like Midazolam, Nitrous oxide, Ketamine, Chloral hydrate, Sevflourane - each having their own advantages and disadvantages, serve an integral part in pediatric dental care.

The aim of this questionnaire survey was to assess the opinions of pediatric dentists and pediatric dental post-graduates regarding sedation based on their knowledge and clinical experience.

Materials and Method

A pre-designed, pre-tested closed-ended electronically formed questionnaire was circulated among Pediatric dentists and Pediatric dental post-graduates of various private and government dental colleges across India through different social media platforms. The study used a descriptive cross-sectional study design to assess the knowledge and usage of various sedative drugs regarding their preference in routes of administration and combinations, common complications encountered, recovery time, and parental acceptance.

A total of 132 participants participated in the study and gave their opinions based on their knowledge and clinical experience.

Results

The results of the study revealed Nitrous oxide to be the most common sedative drug used in Pediatric dentistry (56.80%), followed by Midazolam (30.30%). (Figure 1)

60.60% of the population responded that inhalation was the preferred route of administration for sedative drugs followed by oral route(21.20%) (Figure 2)

68.90% of the study population responded to the use of a combination of drugs for sedation preferably nitrous oxide + midazolam (81.80%). (Figure 3 & 4)

Only 54.50% of the population have attended any training program and have better knowledge of

handling sedative drugs when compared to the rest of the population who didn't pursue any special course. (Figure 5)

For the various complications encountered 40.20% of the participants felt nausea and vomiting to be the most common followed by post-operative sleepiness (23.50%) and diffusion hypoxia (17.40%). (Figure 6)

78.8% of the participants responded for 1-3 hours of recovery time after use of sedative drugs. (Figure 7)

43.90% of the study population felt the use of sedative drugs to be completely acceptable by the parents contrary to 53% who responded for confused parental acceptance. (Figure 8)

For drawbacks of sedation half of the population responded for hallucination and disorientation, 20.50% responded for restlessness followed by disintegration (15.20%) (Figure 9)

A major part of the study population(62.10%) responded to the use of sedative drugs in various types of patients including anxious and uncooperative patients, epileptic patients, syndromic or special needs patients and any patients with underlying medical conditions. (Figure 10)

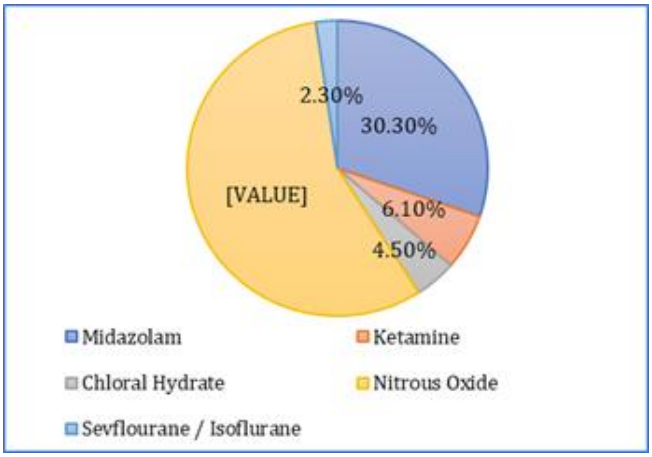

Figure 1: Commonest Sedative Drugs used in pediatric dentistry

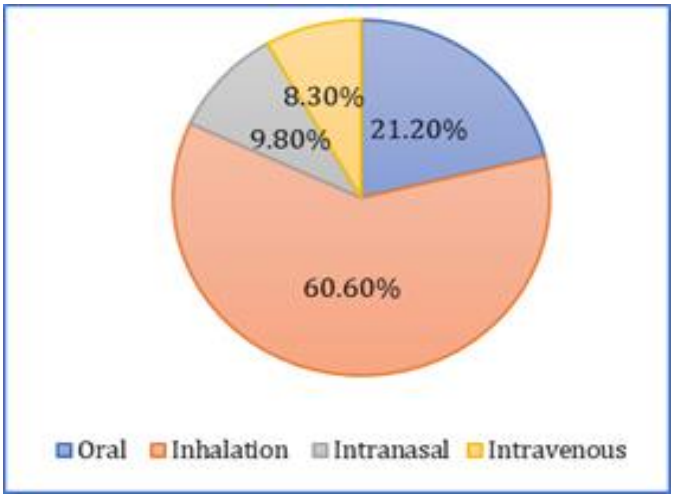

Figure 2: Preferred route of administration for the sedative drugs

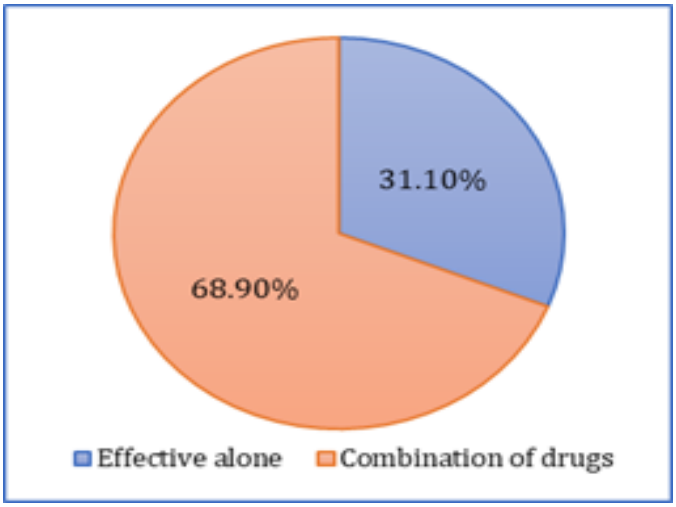

Figure 3: Preferred to use alone or in combination with other drugs

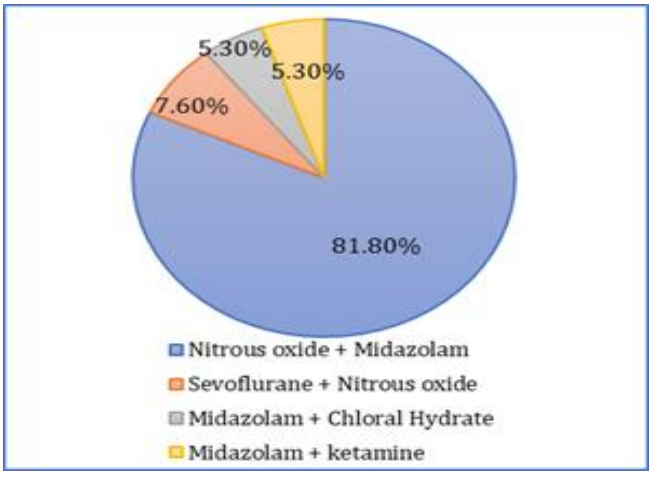

Figure 4: Most common combination of drugs used

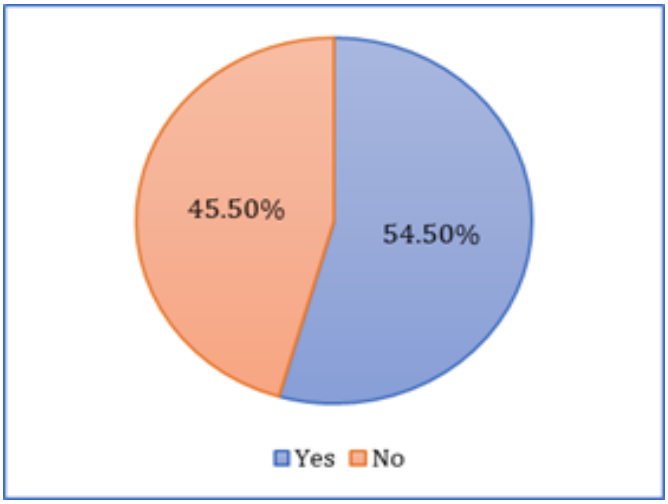

Figure 5: Have you attended any training program or pursued any special course regarding the sedative drugs during or after your postgraduation?

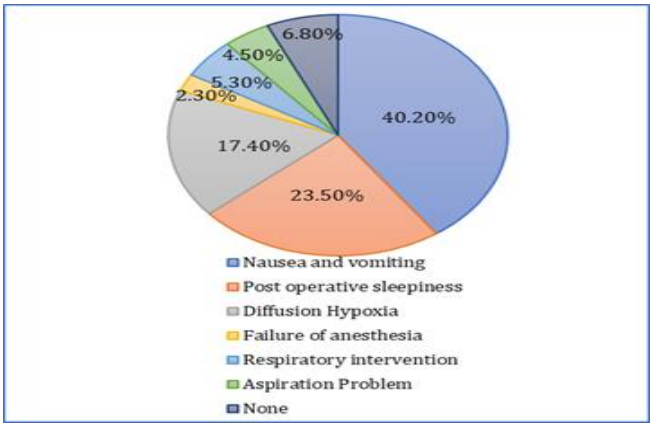

Figure 6: Most common type of complication encountered

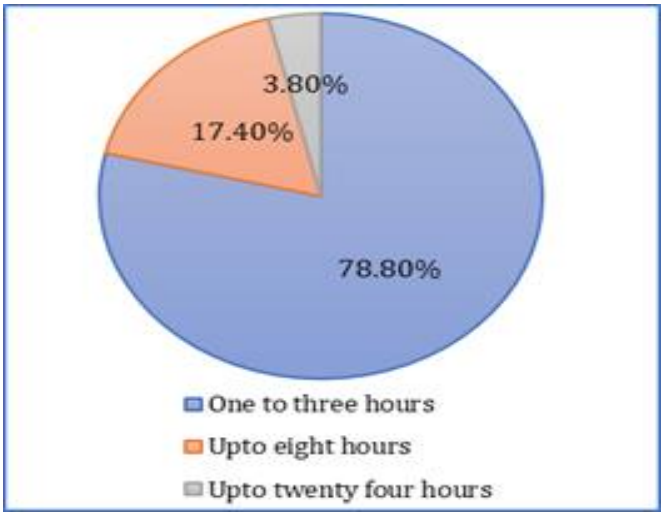

Figure 7: Recovery time after use of sedative drugs

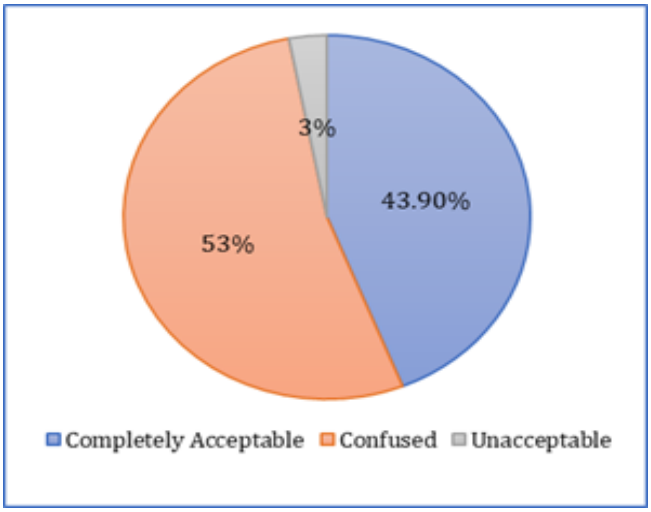

Figure 8: Parental acceptance for use of sedative drugs

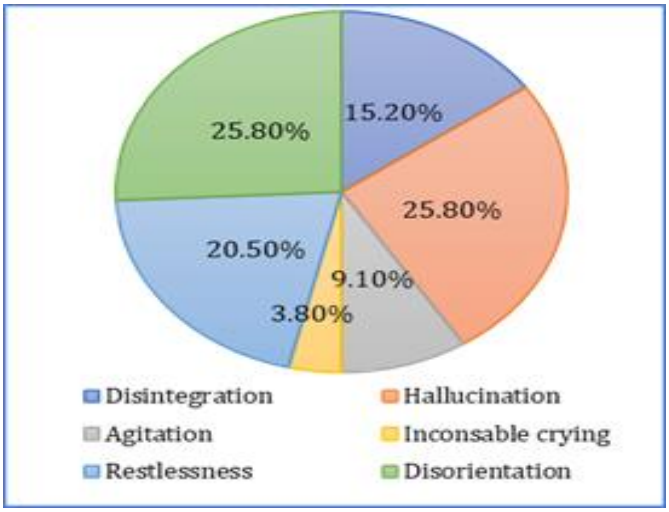

Figure 9: Major drawback seen in sedation

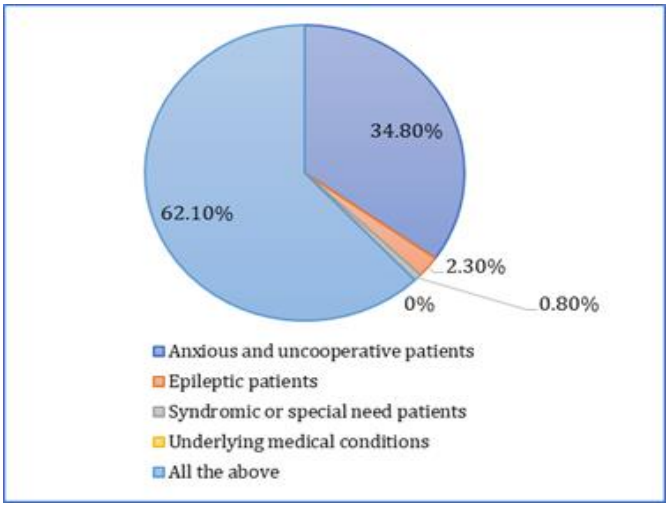

Figure 10: Sedative drugs commonly used in managing which types of patients

Discussion

This study assessed the opinions of various pediatric dentists and pediatric dental post graduates to identify the more effective and more acceptable sedative drug based on their knowledge and clinical experience. The findings indicate nitrous oxide to be the most commonly used sedative drug followed by midazolam similar to a study done by Abijeth B et al [6].

Nitrous oxide and midazolam are well-known pharmacological agents having sedative, analgesic, anxiolytic, and hypnotic properties which can either be used alone or in combination.[6]

According to Nie J et al., a combination of drugs shows higher sedation success rate. [7] Also, it decreases the side effects, mainly reducing the doses of individual drugs necessary via synergism[8] .

There are various pharmacological sedation alternative routes including oral, inhalation, intranasal, and intravenous, inhalation route for nitrous oxide is the most common because of its rapid onset of action, ease of dose control, and recovery time.[6]

Oral midazolam induces a significantly more profound level of sedation when compared to nitrous oxide inhalation regardless of the dose. In contrast, intranasal midazolam offers easy and simple administration [9] and is as effective as nitrous oxide inhalation in accordance with the study of Srinivasan NK et al [1].

In this study, more than half of the population responded confused regarding the parental acceptance of use of sedative drugs which might be associated with the parental education as reported by Alkandari et al [10].

Nausea, vomiting and drowsiness are the most commonly reported adverse effects of sedative agents. Anterograde amnesia property of midazolam has also been found beneficial in making the children forget painful procedures like extractions [9].

Conclusion

Sedation and sedative drugs can increase the success rates of the treatments and can help in achieving the overall goal of pediatric dentists to provide a pain-free treatment and to relieve the fear and anxiety of pediatric patients.

Sedation should be used as an integral part of pediatric dentistry but under proper expertise.

References

1. Srinivasan NK, Karunagaran P, Panchal V, Subramanian E. Comparison of the Sedative Effect of Inhaled Nitrous Oxide and Intranasal Midazolam in Behavior Management and Pain Perception of Pediatric Patients: A Split-mouth Randomized Controlled Clinical Trial. Int J Clin Pediatr Dent. 2021;14(2):111-116.
2. Folayan MO, Idehen EE, Ojo OO. The modulating effect of culture on the expression of dental anxiety in children: a literature review. Int J Paediatr Dent. 2004;14(4):241-5.
3. Jain SA, Rathi N, Thosar N, Baliga S. Midazolam use in pediatric dentistry: a review. J Dent Anesth Pain Med. 2020;20(1):1-8.
4. Eslaamizaad S, Toopchi S. Sedation in pediatric dentistry. Acta scientific dent sci 2019;3(2):40-46.
5. Marques C, Dinis M, Machado V, Botelho J, Lopes LB. Evaluating the Quality of Systematic Reviews on Pediatric Sedation in Dentistry: An Umbrella Review. J Clin Med 2024;13(12):1-24.

6. Abijeth B, Roy A. Conscious sedation in pediatric dentistry-A questionnaire survey. Int J Curr Adv Res 2017;06(04):3329-3332.
7. Nie J, Chen C, Xie J, Ding G. Oral midazolam vs. intranasal dexmedetomidine plus oral midazolam for sedation of pediatric outpatients: a double-blinded randomized controlled trial. BMC Anesthesiol. 2023;23(1):1-9.
8. Rhee KY et al. Sedation with propofol-midazolam combination versus propofol alone during spinal anesthesia: prospective, randomized study. Korean J Anesthesiol 2005;49(6):10-13.
9. Janiani P, Gurunathan D. Comparison of efficacy and safety of midazolam versus nitrous oxide as sedative agents during pediatric dental treatment:A systematic review. Pesqui Bras Odontopediatria Clin Integr 2024;1-11.
10. Alkandari S, Boynes SG, Almousa FA. Dentists' and parents' attitude toward nitrous oxide use in Kuwait. Anesth Prog 2016;63:8-16.