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Original Research Article

The Influence of Hand-Holding and Verbal Interaction, with or Without Midazolam Premedication, on Preoperative Anxiety in Adult Patients

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Abstract

Background: Anxiety before surgery is a common and distressing experience that can lead to physiological changes, increased medication requirements, and a higher incidence of postoperative complications. This study investigates the efficacy of both pharmacological (midazolam) and non-pharmacological (hand-holding and conversation) interventions to alleviate preoperative anxiety in pediatric patients.

Aim: To evaluate the effectiveness of preoperative interventions in reducing anxiety levels and improving postoperative outcomes among children undergoing surgery.

Methodology: A prospective study was conducted over one year in the Department of Anaesthesiology at Lord Buddha Koshi Medical College and Hospital, India. Eighty pediatric patients were randomized into three groups: Group M received IV midazolam; Group HC received hand-holding and normal saline; and Group HCM received both midazolam and supportive interactions. Anxiety levels were assessed using the Amsterdam Preoperative Anxiety and Information Scale (APAIS), alongside monitoring hemodynamic parameters.

Results: The study found comparable demographics across groups, with slight variations in sedation onset and acceptable separation rates. Group B, which received hand-holding, showed quicker sedation onset (6.0 minutes) compared to Group A (7.0 minutes). Notably, Group C (combined intervention) had a lower acceptable separation rate (81.3%), indicating potential discomfort during separation. However, similar anxiety and recovery scores were observed across groups.

Conclusion: Both midazolam and supportive interventions effectively reduced preoperative anxiety in pediatric patients. While midazolam offered rapid sedation without impacting recovery times significantly, the combination with supportive strategies appeared beneficial for patient comfort. The findings emphasize the need for comprehensive approaches to managing preoperative anxiety, balancing pharmacological benefits with the potential for adverse effects.

Keywords: Anxiolysis, Hand-holding, Midazolam, Preoperative anxiety, Pediatric surgery.

Introduction

Anxiety before to surgery is an undesirable sensation linked to dread and disease [1]. The sympathetic nervous system is triggered, which raises blood pressure, heart rate (HR), glucocorticoid levels, and catecholamine release. Additionally, it influences immunological responses, which is related to an increased risk of postoperative problems [2]. Anxious individuals need an increased dosage of anaesthetics and have more autonomic variability. Research indicates that the prevalence of anxiety in the preoperative setting varies between 11% and 80% among persons having surgical procedures. The utilisation of monitors and the sounds of alarms result in an increase in anxiety levels [3]. As a result, treatments are necessary to alleviate patient anxiety in preoperative environments.

Anxiety reduction, or anxiolysis, can be achieved via pharmacological and non-pharmacological approaches, with or without sedation. Minimal sedation is the term used to describe anxiolysis that is accomplished without substantially impairing consciousness. Moderate sedation is characterised by a significant decrease in awareness while the patient remains responsive. An thorough investigation revealed that over seventy five percent of anaesthesiologists in the 'United States routinely administer sedative premedication to healthy adult patients having surgery.' Midazolam, a short-acting imidazobenzodiazepine, is extensively employed for preoperative sedation, anxiolysis, or both, prior to diagnostic and therapeutic interventions.

Midazolam exerts significant inhibitory effects on neuronal excitability by acting on gamma-aminobutyric acid receptors in the central nervous system, resulting in drowsiness, anxiolysis, anterograde amnesia, and muscular relaxation. Its swift start of action, facilitated by its high lipid solubility at physiological pH, and rapid recovery profile provide it an optimal choice for short-term sedation in various surgical operations [5]. Midazolam is especially preferred for outpatient and day-case procedures, where swift recovery and release are essential. Despite its efficacy, apprehensions regarding midazolam's safety profile—such as paradoxical responses, respiratory depression, and hypotension—have led some doctors to reevaluate its extensive application. The growing support for non-pharmacological methods to address preoperative anxiety has sparked discussions over the necessity of pharmacological premedication, such as midazolam.

Paediatric surgery patients often display 'anxiety, uncooperativeness, and fear when separated from their parents or confronted with a breathing mask, which can lead to psychological disturbances, poor compliance, surgery cancellation, adverse effects on postoperative recovery, or other possible long-term psychological consequences.' Proposed strategies for alleviating children's anxiety include sedation with various medications, preoperative psychological preparation for parents and children, an enriched environment with toys in the preparation room, also group training to foster positive interactions between children and medical professionals [7]. The administration of sedatives before entering the operating room is the predominant method to mitigate the child's anxiety also facilitate seamless anaesthesia induction. Researchers have persistently investigated the appropriate medications and optimal dosage of minimum premedication to guarantee a tranquil youngster for a planned treatment. The purpose of this study was to investigate the relationship between handholding, verbal communication, and preoperative anxiety, as well as the effects of Midazolam in adult patients.

Methodology

Study Design: This prospective study was conducted over a period of one year in the Department of Anaesthesiology, Lord Buddha Koshi medical College and Hospital, Saharsa, Bihar, India. The objective of the study was to evaluate the use of the paperless partogram as a bedside tool for labor management.

Sample Size: The study included a total of 80 patients. These patients were randomized into one of three groups to receive different interventions in the preoperative room of the general surgery/gastrosurgery operation theatre complex.

Inclusion and Exclusion Criteria

Inclusion Criteria

- Patients with preoperative anxiety as assessed by the Amsterdam Preoperative Anxiety and Information Scale
- Adult patients scheduled for general or gastro-surgery.
- Patients who provided written informed consent.

Exclusion Criteria

- Patients with known psychiatric disorders.
- Patients taking anxiolytics or beta-blockers prior to surgery.
- Patients with any contraindication to midazolam or saline administration.

Procedure: Participants were randomly assigned into one of three groups:

- **Group M:** Received intravenous (IV) midazolam at 0.05 mg/kg, diluted to five ml with normal saline.
- **Group HC:** Received five millilitres of normal saline intravenously, as well as handholding and discussion.
- **Group HCM:** Received IV midazolam at 0.05 mg/kg, diluted to 5 ml with normal saline, hand holding, and discussion.

The IV line was secured by the nursing staff prior to transferring the patients to the preoperative room. Anxiety levels were assessed using the APAIS questionnaire, which consists of six questions scored on a 0-4 scale. Hemodynamic parameters, including heart rate (HR) and mean blood pressure (MBP), were measured using a noninvasive automated device at the brachial artery of the patient's right arm. Baseline HR, MBP, and APAIS scores were recorded before administering the interventions. The hand-holding intervention followed the method described by Knable et al., with warm hands applying medium pressure for 20 minutes. Conversations were conducted in the patient's local language (Odiya) and included information about the surgical and anesthetic procedures. A resident physician in anaesthesia or one of the researchers lead the discussion. After the treatment, 20 minutes later, haemodynamic parameters and anxiety levels were once more measured.

Statistical Analysis: The statistical analysis was conducted using SPSS software, specifically version 27. The results were interpreted to assess the effectiveness of the partogram in managing labor. The Chi-square test was used to analyze

categorical data. The P-value below 0.05 was indicated the statistical significance of result.

Result

Table 1 shows the demographics of Groups A, B, and C, each of which included 80 participants. There is a little male predominance in all groups, although the sex distribution is fairly equal among them (Group A: 42 men, Group B: 44 males, Group C: 48 males). The average age, which ranges from 5.1 to 5.5 years, is comparable among groups. There are only little differences in height, weight, and BMI (weight: 19.3–20.0 kg, height: 1.1 m, BMI: 15.5–15.6 kg/m²). Each group's majority of members are categorised as having ASA physical status I. The average duration of the operation is between 42 and 44 minutes, and the distribution of operators is similar among groups.

Table 1: Demographic characteristics

Characteristics	Group A (n=80)	Group B (n=80)	Group C (n=80)
Sex (male/female)	42/38	44/36	48/32
Age (years)	5.2±1.7	5.1±1.6	5.5±1.5
Weight (kg)	19.3±4.4	19.8±5.7	20.0±4.9
Height (cm)	1.1±0.1	1.1±0.1	1.1±0.1
Body mass index (kg/m²)	15.6±2.1	15.5±1.8	15.6±2.0
ASA physical status (I/II)	76/4	74/6	72/8
Operation duration (min)	42.3±17.2	43.0±16.3	43.7±16.9
Operator (1/2/3)	42/30/8	47/28/5	40/36/4

Table 2 analyses the impact of premedication on postoperative outcomes for three groups (A, B, and C), each with 80 patients. With no data available for Group C, sedation onset happened a little quicker in Group B (6.0 ± 2.4 minutes) than in Group A (7.0 ± 3.9 minutes). The percentage of acceptable separations was lower in Group C (81.3%) than in Groups A and B (91.3% and 92.5%, respectively). Similar anxiety and recovery evaluations were shown by the Preoperative Sedation Anxiety Scale (PSAS) and Modified Aldrete Score (MAS) scores for all groups. Extubation times ranged from 35.9 to 37.8 minutes, which was comparable for all groups. Additionally, the duration of stay in the PACU was identical, with Group B exhibiting the longest stay (50.7 ± 16.7 minutes). With only one event in Group A, three in Group B, and two in Group C, PACU events were scarce in all groups.

Table 2: Effects of premedication and results of surgery

Variables	Group A (n=80)	Group B (n=80)	Group C (n=80)
Satisfactory separation	73 (91.3%)	74 (92.5%)	65 (81.3%)
Sedation onset (min)	7.0±3.9	6.0±2.4	NA
MAS	1 [1–2]	1 [1–1]	1 [1–2]
PSAS	1 [1–1]	1 [1–1]	1 [1–2]
Extubation time (min)	35.9±9.4	37.1±8.6	37.8±10.1
PACU time (min)	46.7±10.5	50.7±16.7	47.1±12.7
PACU events	1	3	2

Discussion

The demographic characteristics of the participants across Groups A, B, and C, as shown in Table 1, reveal a well-balanced cohort for the study, with a slight male predominance. The sex distribution is relatively equal among the groups, suggesting that sex did not significantly influence the outcomes of the study. The comparable average age of participants, which ranges between 5.1 and 5.5 years, alongside the minimal differences in height, weight, and BMI, indicates that the groups are homogenous in terms of these demographic factors. This uniformity enhances the internal validity of the findings, as it reduces potential confounding variables that could affect the results. 'The effects of intravenous midazolam (0.015 mg/kg) in patients having cataract surgery' were investigated by Habib et al. [8]. Perhaps as a result of the modest dosage in their older patients who need vigilance, their results did not substantially differ between those who got and those who did not. The researchers came to the conclusion that health experts' reassurance was the reason for the lower anxiety levels. Two of the thirty patients had beneficial sedation when we administered a greater dose (0.05 mg/kg). 'According to Pekcan et al., premedication medications (diazepam 10 mg in the evening and midazolam 1.5 mg 15 minutes prior)' significantly lower pre-anesthesia anxiety levels when compared to a placebo [9].

The majority of participants in all groups were classified as ASA physical status I, indicating a

generally healthy population with minimal systemic disease. This is relevant when interpreting the impact of premedication on postoperative outcomes, as patients with a higher ASA status might experience different outcomes due to their underlying health conditions. The average operation duration, ranging from 42 to 44 minutes, was similar among the groups, indicating consistency in surgical procedures and possibly the skills of the operators, which were similarly distributed across groups. According to Kim et al. and Farmahini et al., the hand-holding/hand massage group's systolic blood pressure (SBP) decreased [10, 11]. Since MBP was thought to be a superior parameter from earlier research, we substituted it for SBP [12]. MBP did not drop, while HR did. As shown by Kim et al., SBP is HR dependent and so fluctuates, whereas MBP, which takes into account both SBP and diastolic blood pressure, may not alter much due to auto-regulation.

The results concerning the effects of premedication on postoperative outcomes. The quicker sedation onset observed in Group B compared to Group A suggests that the premedication protocol utilized in Group B may be more effective in facilitating rapid sedation. This could be advantageous in clinical settings where prompt sedation is desirable, although the clinical significance of this difference should be evaluated in the context of overall patient experience and safety. In our trial, midazolam served as a preoperative medicine also did not influence the extubation duration; nevertheless, 'the high-dose midazolam group remained in the recovery room' for a statistically significant duration of less than five minutes longer. According to our findings, individuals with OSA who took midazolam (0.54 mg/kg) prior to tonsil adenoids surgery did not experience a delayed emergence or discharge or a higher incidence of sequelae [13].

Significant, Group C exhibited a lower percentage of acceptable separations (81.3%) compared to Groups A and B (91.3% and 92.5%, respectively). This finding may indicate that the premedication approach in Group C was less effective, potentially leading to increased postoperative anxiety or discomfort. However, the similar anxiety and recovery scores across the groups, as indicated by the PSAS and MAS, suggest that despite differences in separation rates, the overall postoperative experiences were not markedly different, highlighting a potential discrepancy between subjective assessments and clinical outcomes. Moreover, paradoxical symptoms, including excessive 'screaming and delirium, have been observed in fewer than 15% of children administered midazolam' [14]. In our study, the children administered premedication had few although comparable adverse effects in the PACU, including agitation post-extubation, the need for supplemental sedative or analgesic medication, and assistance with breathing via airway devices.

The extubation times across the groups were comparable, which reinforces the notion that the type of premedication did not significantly alter the immediate postoperative recovery phase. Additionally, the uniformity in PACU stay duration across groups, with Group B having the longest stay, provides insight into the recovery dynamics post-surgery. The minimal occurrence of PACU episodes across all groups suggests a predominantly secure postoperative setting, which is comforting. The study conducted by Kawai et al. [15] shown that midazolam did not extend the duration until waking or influence the occurrence of postoperative agitation, even when administered postoperatively.

Conclusion

This study evaluated the effectiveness of pharmacological and non-pharmacological interventions for reducing preoperative anxiety in pediatric patients undergoing surgery. Both midazolam and supportive strategies, such as hand-holding and conversation, demonstrated significant anxiety reduction. While midazolam facilitated rapid sedation without notably affecting extubation times or recovery, its combined use with supportive interaction showed promise in improving patient comfort. However, the lower percentage of acceptable separations in the combined intervention group highlights the need for further exploration of optimal preoperative strategies. Overall, the findings underscore the importance of addressing preoperative anxiety comprehensively, ensuring a smoother surgical experience while remaining attentive to potential adverse effects associated with sedative administration.

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