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ORIGINAL RESEARCH PEDIATRIC ANESTHESIA

Incidence of preoperative anxiety and associated features in children undergoing general anesthesia for a surgery in Middle East population

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ABSTRACT

Background: Children usually experience anxiety before undergoing general anesthesia. We did this prospective cross-sectional study to find the incidence of preoperative anxiety in children undergoing surgery in a tertiary care hospital.

Methodology: This study was conducted at Security Forces Hospital, Riyadh, Kingdom of Saudi Arabia. We included children aged 2-12 y, who were planned to undergo general anesthesia for surgery. Preoperatively, children's anxiety level was assessed using mYPAS (Modified Yale Preoperative Anxiety Scale) scale. We report the incidence of preoperative anxiety as numbers and percentages. We also report the features of children with preoperative anxiety.

Results: A total of 96 children were included in the study. The median anxiety score of children was 26.60 (23.3-41.66). The incidence of preoperative anxiety in pediatric patients was 42.7% (41 cases). The median age of children having preoperative anxiety was lower 55 (44-69.5) months vs 67 (35-90) months in children without anxiety. Sixty-three percent of children with preoperative anxiety underwent ENT and dental surgeries.

Conclusion: We found an incidence of 42.7% of preoperative anxiety in children undergoing surgery at our hospital.

Key words; Preoperative Anxiety; Anxiety Score; General Anesthesia; PACU

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1. INTRODUCTION

Children undergoing general anesthesia (GA) for a surgery usually experience preoperative anxiety. Preoperative anxiety is described as an unpleasant mood or uneasiness preoperatively which is usually accompanied by physiological effects including sweating, nausea, and tachycardia and psychological effects including nervousness, aggression, and apprehension. It is estimated to occur in approximately 50% of children undergoing surgery.[1]

Preoperative anxiety is associated with increased postoperative pain scores, higher opioid consumption, prolonged PACU stay, and abnormal sleep patterns.[2] There have been few studies suggesting a positive association of preoperative anxiety with emergence delirium (ED);[3, 4] while others have disregarded the association.[5] There can be different reasons for preoperative anxiety in different groups of children. Younger children usually tend to be anxious either due to separation from parents or preoperative fasting while older children are more anxious about the surgical and anesthetic processes.[6] Also, younger children are more likely to have preoperative anxiety.[7,8] Additionally, other

risk factors include children's temperament and previous history of surgery. Children who are shy and have lesser social temperaments, tend to be more anxious preoperatively.[7] Parental factors like anxiety and the ability to cope with children's behavior have also been found to be important factors for children's anxiety. The level of parental anxiety secondary to cultural differences may influence their children's anxiety and hence postoperative adverse outcomes.[9]

This prospective, observational study aimed to find the incidence of preoperative anxiety in children aged 2-12 y, undergoing GA for surgery in a tertiary care hospital in a Middle-East country.

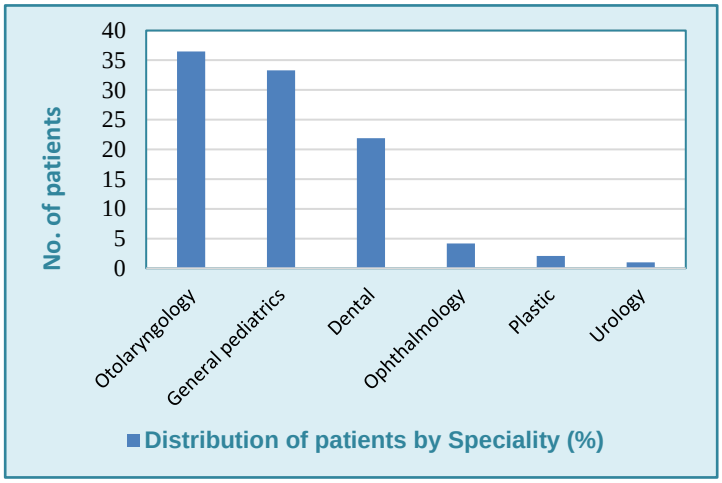

Figure 1: Distribution of patients among different surgical specialties

2. METHODOLOGY

We conducted a prospective cross-sectional study at a tertiary care hospital in Riyadh, Saudi Arabia. Institutional ethical committee approval was obtained. Children aged between 2-10 y, scheduled to undergo GA for a surgery with an ASA score of 1 to 3 were included in the study. Written informed consent for the study was obtained from children's parents or guardians. We excluded children with developmental delays, neurological disease, and those who had undergone previous surgery.

Preoperatively, children's anxiety level was assessed using mYPAS (Modified Yale Preoperative Anxiety Scale) in the presence of one parent 30 min before the start of surgery. This scale was developed in 1995 and later modified in 1997. [6,10] The mYPAS consists of 5 items (activity, vocalizations, emotional expressivity, state of apparent arousal, and use of parent). Each item has Likert-type response options reflecting behaviors. Children's behavior is rated from 1 to 4 or 1 to 6 (depending on the item). The calculation of the scale produces a score ranging from 22.92 to 100 with greater values indicating greater anxiety. The mYPAS measure has strong internal reliability, interrater reliability, and convergent validity.[10]

Regarding the sample size, the expected incidence of preoperative anxiety was taken as 53% from a previous study.[1] To estimate the incidence with a precision of 10%, 95% CI, 96 children undergoing GA for a procedure were needed. We entered and analyzed all study data in SPSS version 25. We report the incidence of preoperative anxiety as numbers and percentages. We also report the features and demographics of children with and without preoperative anxiety.

3. RESULTS

A total of 96 children were included in the study. All variable data were found to have a non-normal distribution. The median age of children in the study was 59 (IQR: 43-76) months. Among 96 children, 30 (31.3%) were females vs 66 (68.8%) males. Sixty (62.5%) patients underwent day care surgery. The distribution of children by surgical specialties is demonstrated in graph I. Twenty-five (26%) children underwent adenotonsillectomy followed by dental rehabilitation 23 (24%), hernia repair 15 (15.6%), orchidopexy 8 (8.3%), EUA ENT 6 (6.3%), circumcision 4 (4.2%), eye surgery 4 (4.2%) and grommet 3 (3.1%). Among 96 patients, 2 were asthmatic, 2 had renal disease and 1 had hearing problems. No patient had any adverse event in the perioperative period.

The median anxiety score of children was 26.60 (23.3-41.66). The incidence of preoperative anxiety in pediatric patients was 42.7% (41 cases). The median age of children having preoperative anxiety was lower 55 (44-69.5) months vs. 67 (35-90) months in children without anxiety. Seventy percent of children with preoperative anxiety were male vs. 67% of children without anxiety. Fifty-three percent of children with preoperative anxiety underwent surgery as day care cases vs. 69% in children without preoperative anxiety. Sixty-three percent of children with preoperative anxiety underwent ENT and dental surgeries vs. 54.5% in children without preoperative anxiety.

4. DISCUSSION

Our study demonstrated that the incidence of preoperative anxiety in children was 42.7%. This incidence was less than that reported in the study by Jooma et al.[11] at 69.2%. Although the incidence in our study is more or less the same as reported by studies as

40 to 75%.[12-14] On the other hand, Ali et al reported an incidence of 24% in the South Asian population. Cultural variations in parental behavior towards children may affect children's behavior and hence could also account for the differences in incidence of preoperative anxiety in children undergoing surgery.[15]

We found in our study that the median age in patients with preoperative anxiety was lower than that in children without anxiety. Few other authors also demonstrated that children below the age of 4 years are at increased risk to develop preoperative anxiety.[16, 17] This could be because the younger children are less able to cope with the stress encountered while being prepared for undergoing surgery. Mamtora et al.[17] also found child age and temperament as risk factors for developing preoperative anxiety. They reported that younger children and those rated as less sociable developed higher scores of preoperative anxiety. Another study by MacLaren et al.[18] concluded that children in the age range of 1-6 y often lack the coping abilities to deal with a stressful environment.

An important finding in our study was that 69% of the children without preoperative anxiety were day care surgery cases as compared to 53% of the children with preoperative anxiety. This suggests a protective role of day care surgery which encounters relatively shorter stays of children in the hospital setting. The children admitted to the hospital on the day before surgery may encounter more stress while staying in the hospital environment overnight. The interaction with hospital staff and lower quality or duration of sleep in a new environment may contribute towards a higher risk of anxiety preoperatively.

In current anesthesia practice, there are many pharmacological and non-pharmacological interventions available to help reduce preoperative anxiety in children. Among pre-medications used for preoperative anxiety, midazolam has been the most commonly used medication.[19] There are other alternatives available as well including fentanyl, clonidine and dexmedetomidine etc.[20] Additionally, there are various non-pharmacological interventions including parental presence during induction, providing written or audio-visual information, and educational programs as well.[3, 21] It is therefore very important to understand the incidence of preoperative anxiety in children so that appropriate measures could be undertaken preoperatively.

5. LIMITATIONS

There are a few limitations in our study. It is a single-center study. We had a relatively smaller sample size. Also, preoperative anxiety was only assessed before administering premedication.

6. CONCLUSION

We found an incidence of 42.7% of preoperative anxiety in children undergoing surgery at a hospital setting in Middle East.

7. Data availability

The numerical data generated during this research is available with the authors.

8. Conflict of interest

The study utilized the hospital resources only, and no external or industry funding was involved.

9. Authors' contribution

AUH: Original concept, Scientific literature search, Data collection, Data analysis, Manuscript writing, Editing, Final Approval

AA: Data collection, Manuscript writing, Editing, Final Approval

ZA: Scientific literature search, Manuscript writing, Editing, Final Approval

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