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Original Article

Preoperative anxiety in children undergoing elective circumcision: A cross-sectional study in a training and research hospital

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Abstract

Aim: Limited research has been conducted regarding the symptoms of preoperative anxiety that children exhibit prior to circumcision. The aim of this study is to determine the frequency of preoperative anxiety symptoms in children preparing for circumcision and the associated factors.

Materials and Methods: This cross-sectional study included 62 subjects ranging from ages 2-12. A personal information form, which the research team developed, was used to evaluate the socio-demographic and clinical data of the participants. Symptoms of preoperative anxiety were assessed using the modified Yale Preoperative Anxiety Scale.

Results: The mean age of the participants was 7.37±2.97 and m-YPAS scores were 56±18.10. Increased preoperative anxiety symptoms were observed in 82.3% (n=51) of circumcised children. Subjects who engaged in certain activities prior to admission exhibited significantly lower m-YPAS scores compared to those who did not ($p<0.05$).

Conclusions: The early recognition and management of preoperative anxiety in children expecting circumcision will help clinicians in preventing the potential complications associated with increased preoperative anxiety.

Keywords: Circumcision; children; preoperative anxiety

INTRODUCTION

Circumcision is described as the partial or complete surgical removal of the distal penile foreskin and is performed in 1/3 of all male children worldwide, making it the most common elective surgical procedure (1). The purpose behind applications for circumcision was included medical-therapeutic, protective-hygienic, and cultural as well as religious reasons (2). In addition to the biological aspect of elective circumcision, the psycho-social magnitude must also be considered. The psychological effects of circumcision are a topic that continues to be discussed and the literature has not provided a mutual viewpoint regarding this subject (3). The study of this topic faces significant methodological problems including cultural variations between populations being studied, fewer studies being conducted on the Middle Eastern population where the circumcision practice is more widespread, and a limited number of studies involving extended monitoring of subjects (3). One of the psychological problems associated with circumcision is also the preoperative anxiety (4). Preoperative anxiety is defined as feelings of nervousness, worry, and tension associated with an impending surgical experience (5-8). Since induction of anesthesia essentially represents the unknown, it can be obscure and quite frightening for children; signs of severe stress or anxiety are observed in 75% of children who receive anesthesia prior to surgery (9). Experiencing intense preoperative anxiety has been linked to unfavorable complications including the following: prolonged anesthesia induction and postoperative recovery, postoperative delirium, emotional and behavioral problems, sleep disturbances, postoperative pain, and increased use of analgesic drugs (5,8-12). Consequently, preoperative anxiety is common in children undergoing surgical operations and can have adverse psychological and clinical implications (12). Despite the importance of preoperative anxiety, there are few studies that have investigated the symptoms of preoperative anxiety in children undergoing circumcision (13). This study attempts to obtain data which will help to address this research gap. The aim of this study is to determine the frequency of preoperative anxiety in circumcised children and evaluate the associated risk factors.

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This research seeks to address the following questions:

1- How common are symptoms of preoperative anxiety in children prior to going through the circumcision operation?

2- What are the factors associated with preoperative anxiety in children being circumcised?

MATERIALS and METHODS

Sampling and Procedure

This cross-sectional study was conducted at the Anesthesiology and Reanimation Department of Erzurum Regional Hospital for Research and Education between the dates of 07/01/2016 - 01/01/2017. The planned study sample included children who applied to the urology department for circumcision. Inclusion criteria for the study were as follows: subjects must be between the ages of 2-12, not have any history of bleeding disorders, the parent that fills out the form must be able to read/write and have sufficient Turkish language skills, and the participants must not be diagnosed with intellectual disability or autism spectrum disorder(s). Patients who did not consent or whose parents had a mental disorder (i.e psychotic disorder or intellectual disability) were not included in the study. The parents of the children who met the inclusion criteria were informed about the study; 54% of these parents (n=62) agreed to participate. Parents who agreed to participate gave their informed consent and were instructed to fill out a Personal Information Form. According to American Society of Anesthesiologists (ASA) classification, physical status of the children was evaluated (14). Symptoms of preoperative anxiety were evaluated by the second author (M.E.N.) using the modified Yale Preoperative Anxiety Scale (m-YPAS); this took place in the waiting room half an hour before the operation for every child. Patients were subsequently transferred to the operation room and sedated through a standard sedoanalgesic method. Following surgery, the participants woke up in the recovery room and were accompanied by health care personnel to their room where their family was waiting. In accordance with the Declaration of Helsinki, approval for the study was obtained from the Erzurum Regional Hospital for Research and Education Ethics Committee with respect to decision number 2016/12-90.

Measures

Personal Information Form

Parents who agreed to participate were instructed to fill out a personal information form prepared by the research team. This form was used to acquire socio-demographic data such as the children's age, gender, and history of surgery, amusement and parents' education status. Additionally, the presence of certain activities done outside of the hospital before the operation such as eating, shopping/receiving gifts, and excursion were asked in this form.

Modified Yale Preoperative Anxiety Scale (m-YPAS)

The m-YPAS was developed by Kain and colleagues (15). The reliability and validity of the scale for Turkey have been studied by Hatipoğlu et al. in 2019 (16). The scale is comprised of 5 parts including activity, vocalizations, emotional expressivity, state of apparent arousal, and use of parents. Total scores on the m-YPAS are calculated ranges between 23.33 and 100. A value of 40 was indicated to be the cut-off score for the m-YPAS (16). Scores are positively oriented, with higher scores indicating a higher preoperative anxiety. The Cronbach alpha coefficient of the Turkish-language form of the scale was calculated as 0.85. The Cronbach α coefficient of the m-YPAS in the present study was 0.72 (16).

Statistical Analyses

The statistical analysis of data was carried out using SPSS for Windows, Version 21.0. The study utilized percentage, arithmetic mean, and standard deviation. The distribution of data was evaluated using the Kolmogorov-Smirnov Test. Parametric data was assessed using the Independent sample t-test, while non-parametric data used the Mann-Whitney U test. Factors related to preoperative anxiety scores were evaluated by composing a model using multiple linear regression analysis. The possible variables associated with preoperative anxiety scores including age, previous surgery, presence of sibling, activity before admission, informing the child/family were computed (for all factors; absence: 0, presence: 1) in this model. The statistical significance was indicated to be $p<0.05$.

RESULTS

62 children between the ages of 2-12 were included in the study. The mean age of participants was 7.37±2.97. The mean duration of parental education was 10.08±3.56 (years). According to ASA classification, the majority of the participants were ASA 1 %82.3 (n=51). Applications for circumcision were for different reasons including 87.1% (n=54) religious, 4.8% (n=3) cultural, 4.8% (n=3) protective-hygienic, and 3.2% (n=2) medical-therapeutic. Table 1 shows the descriptive characteristics of the subjects.

Table 1. Sociodemographic and Clinical Characteristics of the Subjects

Variables	n (%)
Age	7.37±2.97
Age Group	
2-6 years	26 (41.9)
7-16 years	36 (58.1)
Gender	
Male	62 (100)
Mean duration of parental education (years)	10.08±3.56
Previous Surgery	
Present	14 (22.6)
Absent	48(77.4)
Informing the Family and Child about the Operation	
Present	54 (87.1)
Absent	8 (12.9)
Activity Prior to Admission	
Present	46 (74.2)
Absent	16 (25.8)

Types of Activities	
Eating	32 (51.6)
Shopping/receiving gifts	31 (50)
Excursion	27 (43.5)
Amusement/Partying	16 (25.8)
ASA score	
ASA 1	51 (82.3)
ASA 2	6 (9.7)
ASA 3	3 (4.8)
ASA 4	2 (3.2)
Presence of preoperative anxiety	
Yes	54 (87.1)
No	8 (12.9)

The average m-YPAS score of the cases was 56.90±18.10. When preoperative anxiety was specifically evaluated, it was determined that 82.3% (n=51) of cases had anxiety present. Subjects who engaged in a certain activity before admission had significantly lower anxiety scores than those who did not (Independent sample t-test, t-score= 3.268, p=0.002). The children with sibling(s) had significantly higher scores for preoperative anxiety levels on the m-YPAS than children who did not have a sibling (Independent sample t-test, t-score= 2.221, p=0.030).

Table 2. Comparison of m-YPAS Score Variations Between Different Subgroups

	Mean±SD	Mean±SD	p-value
Activity before Admission	Present (n=46) 68.75±14.67	Absent (n=16) 52.78±17.48	**p=0.002[a]**
Age	Younger (n=26) 59.61±18.12	Older (n=36) 54.71±18.30	p=0.303[a]
Previous Surgery	Present (n=14) 50.71±18.30	Absent (n=48) 58.22±17.70	p=0.172[a]
Informing the Family/ Child	Present (n=54) 56.13±18.09	Absent (n=8) 65.00±16.37	p=0.207[b]
Presence of sibling(s)	None (n=18) 49.16±14.53	≥1 (n=44) 60.07±18.61	**p=0.030[a]**

[a]Independent Sample t-test ;[b]Mann–Whitney U-test; Standard Error: SE

When preoperative anxiety was evaluated with respect to age; younger and older children both exhibited similar levels of anxiety (Independent sample t-test, t-score= 1.038, p=0.303). m-YPAS scores of the children who were not informed was higher than those of the children informing the family/child; however, no significant difference was detected (Mann-Whitney U test, z-score= - 1.262, p=0.303). Table 2 shows comparison of m-YPAS scores between different subgroups that are divided based on presence of activity, history of surgery, informing the family/child, and age.

Table 3. Multiple Linear Regression Analysis for Predictors of Emotional Problems

						95.0% CI for OR	
	SE	Beta	T	p-value	OR	Lower	Upper
Older Age	4.9	-0.017	-0.126	0.900	-0.6	-10.4	9.2
Previous Surgery	5.3	-0.161	-1.305	0.198	-6.9	-17.6	3.7
Informing the Family/Child	6.4	-0.056	-0.450	0.655	-2.9	-15.8	10.07
Activity before Admission	5.5	-0.353	-2.595	**0.012**	-14.4	-25.6	-3.2
Presence of sibling(s)	4.7	-0.196	-1.582	0.120	-7.5	-17.2	2.03

Notes: R=0.495. R2=0.245; p-value = 0.000. Bold data, p<0.05 (significance). CI;Confidence Interval. Standard Error: SE; *reference, absence (0) → presence (1)

A multiple linear regression model was used to assure independent evaluation of predictive variables for preoperative anxiety symptoms in children who underwent circumcision. The multiple linear regression model was found to be significant (p-value = 0.009 with an R2 of .245). The analysis revealed a statistically significant relation between preoperative anxiety symptoms and activity before admission (B = -14.4, p = 0.012). Table 3 shows the multiple linear regression model results related to preoperative anxiety symptoms.

DISCUSSION

Being among the few studies evaluating preoperative anxiety levels in circumcised children; important implications have been obtained through this study. In our research, preoperative anxiety levels and associated factors were investigated in children who underwent circumcision. Our study showed that 82.3% of circumcised subjects expressed symptoms of preoperative anxiety which was consistent with the results of other studies in the academic literature (13,17). In a study which examined predictive factors of postoperative pain and anxiety in children undergoing elective circumcision, 61.5% of cases were reported to have an increase in preoperative anxiety (13). During their study which compared the local anesthetic effects of lidocaine and tramadol hydrochloride during circumcision, Polat et. al. found that 38.5% of the cases demonstrated anxiety symptoms (4). The study included some methodological limitations. When judging the results of the previously mentioned study, it should

be noted that the scale measuring signs of anxiety is not specifically intended for assessing preoperative anxiety; in addition, the scale is a self-report that is filled out by the children (4). Both studies primarily focused on evaluating the pain associated with circumcision rather than preoperative anxiety symptoms (4,13). As mentioned above, circumcision is an elective surgical procedure that is frequently performed in children; since elective surgeries commonly present preoperative anxiety symptoms in children, the signs of preoperative anxiety during the circumcision process have great significance (1,18). Due to increased preoperative anxiety levels bearing negative clinical and psychological consequences, further research must be conducted to make better use of already-limited hospital resources. During hospitalization, various mitigation methods can be used to reduce the symptoms of preoperative anxiety (19-23). Along with the methods used to relieve anxiety during hospitalization, certain approaches prior to admission helps to reduce preoperative anxiety symptoms (23). Since most of the studies that aimed to reduce preoperative anxiety symptoms before hospitalization were focused on psycho-educational preparation programs, there is insufficient research directed towards behavioral intervention programs which can be directly used to mitigate the symptoms of preoperative anxiety before admission (23). Our study also took into account the relationship between the cultural behavioral activities performed before elective circumcision in our country and the symptoms of preoperative anxiety. Before and after elective circumcision in Turkey, many activities take place including feasts, festivals, music, and excursions (24). Our study demonstrated that preoperative anxiety symptoms show a significant increase in children who were not involved with any activity prior to admission when compared with children who were. The findings of this study indicate that the activities before hospitalization may be performed to relieve preoperative anxiety symptoms. However, further structured research is necessary. Other factor associated with preoperative anxiety symptoms was having a sibling. These finding was consistent with those of Zavras and colleagues who found a significant relationship between preoperative anxiety symptoms and presence of sibling (13). Higher preoperative anxiety symptoms in the children with sibling may be best explained by the fact that parents' interests before the surgery is divided due to the needs of other siblings. Other notable findings of this study include that children of ages 2-6 exhibited similar levels of preoperative anxiety as older children between the ages of 6-14. In a study conducted by Zavras et. al., no significant relationship was found between age and manifestations of negative behavior in children who were circumcised (13). In the study done by Sancar et. al., which investigated the level of fear in children undergoing circumcision; children aged 6 and greater expressed significantly less fear in comparison to children that were younger (25). The literature does not offer a collective conclusion for the short and long-term (with age) effects of circumcision on the mental health of children. No significant relationship was found between the presence of history of previous surgery and preoperative anxiety symptoms. Similarly, In a study evaluating preoperative anxiety levels in children, Topalel et al. found that there were no statistically significant difference in preoperative anxiety levels based on the presence of history of previous surgery (17). However, Chrousos and colleagues revealed that previous negative hospital experiences were associated with higher levels of preoperative anxiety in children (26). Taken together, these results suggest that there has been little agreement on this issue. Another observation made from our research was the primary motive for circumcision being religious reasons. Other studies conducted in Turkey similarly showed that religious factors were the main reason families applied for circumcision (4,25,27). There are many reasons for circumcision that vary across different communities (2); this is a critical factor that clinicians must keep in mind when evaluating the psycho-social effects of circumcision. .

LIMITATIONS

This study contained some limitations. These include the cross-sectional design of the study, taking place in a single center, and having a relatively low number of subjects.

CONCLUSION

Surgical operations are a serious source of stress and can lead to intense anxiety in children (28,29). Symptoms of preoperative anxiety are frequently seen in children preparing for circumcision. Thus, health-care professionals should be mindful of these symptoms; in doing so, complications associated with increased preoperative anxiety can potentially be prevented. This topic requires more research with larger samples.

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