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## Visiting the Operating Theatre Before Surgery Did Not Reduce the Anxiety in Children and Their Attendant Parent

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### ABSTRACT

**Purpose:** The induction of anesthesia is known to be the most stressful part of the day of surgery for the child. Non-pharmacologic intervention is a field of great interest. The aims of this prospective randomized study were to evaluate if (1). A preoperative visit to the operating theatre would attenuate the anxiety of the child on the day of surgery. (2). A preoperative visit to the operating theatre would attenuate the anxiety of the parent on the day of surgery.

**Design and Methods:** Children aged 3–12 years and their parents were randomly assigned to the intervention group visiting the operating theatre before surgery and the control group, which never visited there. Anxiety of the children in the preoperative period was measured by using the Swedish version of the modified Yale Preoperative Anxiety Scale (m-YPAS). Parent anxiety was measured by the State-Trait Anxiety Inventory (STAI) instrument.

**Results:** Both the children and their parents showed an increase in anxiety during the day of surgery up to the induction of anesthesia. Children in the intervention group showed no reduction in anxiety compared to the control group. There were no differences in anxiety between the parents in the intervention and the control groups.

**Conclusions:** Though a preoperative visit to the surgery department and extensive information and therapeutic play does not seem to decrease the anxiety of the children scheduled for surgery and their parents it might be very important as information is highly wanted. Non-pharmacological interventions still need investigation in larger studies.

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### Introduction

Patients awaiting surgical procedures often experience significant anxiety. The induction of anesthesia is known to be the most stressful part of the day of surgery for the child (Kain et al., 2006; Proczkowska-Bjorklund, Gustafsson, & Svedin, 2010). Fear and anxiety are not isolated concepts from separation, information and treatment but correlates with each other (Steward, 2001). Feelings are easily transferable between parents and children, and parental anxiety is a significant predictor of child anxiety (Messeri, Caprilli, & Busoni, 2004). It is a field of much attention and research to find a multimodal approach for both adults and children to alleviate discomfort and anxiety prior to anesthesia in order to avoid negative postoperative psychological and physiological interventions, pain and prolonged recovery. Pharmacologic premedication intends to minimizing psychological trauma related to anesthesia and surgery. The Cochrane reviews from 2009 and 2015 (Manyande, Cyna, Yip, Chooi, & Middleton, 2015; Yip, Middleton, Cyna, & Carlyle, 2009) including 17 and 28 studies both conclude that

promising non-pharmacological interventions to assist the induction of anesthesia in children must be further investigated.

Presence of parents during induction of general anesthesia is not shown to reduce the anxiety of children (Manyande et al., 2015), though this is a common practice at most hospitals around the world including Sweden. Other possible preparations for the child and the supporting parent are *written information* such as leaflets (Bellew, Atkinson, Dixon, & Yates, 2002), *Audio Video*, *Apps* information (Berghmans et al., 2012; Liguori et al., 2016; McEwen, Moorthy, Quantock, Rose, & Kavanagh, 2007; Zuwala & Barber, 2001), *clowndoctors* (Vagnoli, Caprilli, Robiglio, & Messeri, 2005) *sedative premedication* (Kain et al., 2000) and a *preoperative visit* (Fincher, Shaw, & Ramelet, 2012; William Li, Lopez, & Lee, 2007). There are also studies that have mixed two or more of these interventions in a preoperative program ((Chan & Molassiotis, 2002; Fincher et al., 2012; Vagnoli et al., 2005).

There has been an idea that preoperative therapeutic play might be effective in reducing anxiety prior to anesthesia (William Li et al., 2007). The pre- and postoperative state anxiety scores in school-aged children have been reduced in a few studies following preanesthesia therapeutic play (William Li et al., 2007). However, there are no such studies from Europe or North America and there are also no studies including a

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mixture of pre-school and school-aged children. The aim of this randomized study was to determine whether a preoperative visit to the operating theatre could relieve the anxiety of children aged 3–12 years and their parents before and during the induction of general anesthesia for minor surgery. No sedative premedication was used and all children were accompanied to the operating theatre by one of their parents.

## Design and Methods

### Patients

Children aged 3–12 years and scheduled for minor day surgery at the ENT clinic of Central Hospital Karlstad, (Sweden) and their parents participated in this randomized prospective study. The children were ASA (American Society of Anesthesiologist) classification I-II. ASA 1 refers to a normal healthy patient, ASA 2 describes a patient with mild systemic disease without substantive functional limitations (i.e. mild asthma). Children with parents who could read and speak Swedish were included. Children with behavior disorders and those who had received anesthesia before were excluded. There was a written consent from all parents and children 8 years or older. The participating child and his or her parent were considered as a pair. The sample size was based on earlier investigations involving parental presence, clowns and sedative premedication (Golan, Tighe, Dobija, Perel, & Keidan, 2009; Vagnoli et al., 2005; Vagnoli, Caprilli, & Messeri, 2010). Consecutive patients and their parents were asked by the surgery coordinator at the ENT clinic to participate in the study. A total number of 62 pairs of parents and their children were included, a number equal to the sample size in similar studies (Golan et al., 2009; Vagnoli et al., 2005; Vagnoli et al., 2010). The surgery coordinator randomized the patients after inclusion by using prepared sealed envelopes. The aims of this study were to evaluate if (a) a preoperative visit at the operating theatre would attenuate the anxiety of the child on the day of surgery, (b) a preoperative visit at the operating theatre would attenuate the anxiety of the parent on the day of surgery.

### Study Groups

#### Preoperative Visit Group

Children and parents randomized to the preoperative visit group were able to visit the operating room (OR) for 45 min on a Wednesday afternoon one or two weeks before surgery. Therefore the number of participants varied. The same parent accompanied the child both at the preoperative visit and at the day of surgery. They were welcomed by an anesthesia educated nurse. He or she had a schedule to follow to ensure that the same information was given each time. Children and parents were first taken on a tour starting at the preoperative apartment, the waiting room and then to a fully equipped operating room. Here the anesthetic machine was demonstrated as well as the ECG, the blood pressure cuff and the pulse oximeter. All the children could try the anesthetic mask or place it on a doll. Intravenous catheters were also demonstrated. The children and their parents were able to test the operating table and to elevate and lower it. All the equipment could be tried on different dolls and the information was adjusted to the age of the children. The parents were free to ask questions. The visit was ended at the postoperative department and the children were offered ice cream.

#### Control Group

None of the participants in the control group visited the operating theatre before the day of surgery. The children were accompanied in the OR by one of their parents.

#### The Day of Surgery

The children and their parents were met by the study designer in the reception and were reminded not to reveal what study group they

belonged to. The anesthesiologist in charge of the OR was blinded to the purpose of the study. The same evaluator ranked the child's and the parent's anxiety at the various time points.

### Evaluation Instruments

The modified Yale Preoperative Anxiety Scale (m-YPAS) is an observational behavioral checklist that has been widely used to evaluate the behavior of children prior to surgery (Golan et al., 2009; Kain et al., 1997). In this study the Swedish version of m-YPAS was used to evaluate the child in the waiting room and two times in the OR; after arrival and at the start of anesthesia induction (Fig. 1). These time-points were chosen because they are used in earlier studies (Kim, Jung, Yu, & Park, 2015), and we considered them easy to standardize and they seem to be the most stressful during the time before surgery. m-YPAS is divided into five categories: activity, vocalization, emotional expressivity, state of arousal and use of parents, which are assessed independently. Each category is given a score from 0 to 4 or 6 (vocalization). A validation study of the Swedish version of the m-YPAS has shown good consistency and interrater validity (Proczkowska-Björklund, Gimble Berglund, & Ericsson, 2012).

The State-Trait Anxiety Inventory (STAI) instrument was used to measure the anxiety of the parents at two times, in the waiting room before surgery and when the child had been anesthetized and left at the OR. It is a very well validated tool translated and adapted to almost 50 different languages (Spielberger, 1983). The first part measures trait (baseline) difference in personal proneness to experience anxiety, and the second part measures the degree of anxiety at that very moment (state). Each part consists of 20 questions which are answered on a four-point scale. Total scores for the trait and state parts are at a range from 20 to 80 each. A high score indicates a higher degree of anxiety. The STAI instrument is used in several similar studies (Vagnoli et al., 2010) (Fig. 2).

### Data Analysis

Data of 57 pairs of children and parents were analyzed by using the SPSS 24.0 for Windows (SPSS Inc., Chicago, IL, USA). The comparison between groups was analyzed with the Mann-Whitney *U* test. The anxiety level of children within the same group in the waiting room and in the OR two times, was compared by using a repeated-measures analysis of variance (ANOVA). All tests were with statistical significance defined as  $p < 0.05$ . To determine intra- and inter-individual reproducibility between two observers scoring the m-YPAS, Cohen's  $\kappa$  calculation was used.

## Results

A total number of 62 pairs of parents and their children were included. Five pairs dropped out or were excluded by the authors. One parent revealed what study group she belonged to, one child had a diagnosed behavior disorder, one parent had difficulties reading Swedish and two pairs changed their minds. The participating children and their parents were recruited between April and November 2014. As shown in Table 1 no significant differences were found in the demographic characteristics of the participants according to the children's age, the parents' gender and the parents' STAI-t value between the study and the control group. In most cases, mothers accompanied their children at the day of surgery. The m-YPAS Cohen's  $\kappa$  calculation during the observations was 0.82, which is considered very good agreement between the two observers who codified the data.

Fig. 4 shows the situational anxiety level of the parents at the two locations. No significant differences were found between the two groups using repeated-measures ANOVA. Both groups showed a significant ( $p < 0.05$ ) increase in situational anxiety level from the timepoint when parent and child sat together in the waiting room (timepoint 1) and

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