Does parental presence help during induction of anaesthesia in children?

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ABSTRACT

This study was aimed to measure the parental anxiety level during their presence at induction time and to measure the effect of parental presence on the child’s behavior.

One hundred children, aged 2-10 years, scheduled for elective general anaesthesia were randomly grouped into treatment group and control group after premedication with intranasal midazolam. We assessed the parental anxiety by pulse rate variations and for children’s behavior changes we use behavior questionnaire preoperative and postoperative. Anaesthesia was induced by using sevoflurane oxygen nitrous oxide inhalation. The anaesthesiologist graded the level of the children’s stress at anaesthesia induction with a four point scale.

No differences have been found between the two groups regarding demographics, parental anxiety levels and postoperative behavioral changes and stress scores of the children.

To conclude that parental presence made no change in terms of child’s anxiety or postoperative behavioral changes.

KEY WORDS

Parental presence; anxiety; behavioral changes; anaesthesia induction
INTRODUCTION

Painful procedures are a necessary part of pediatric care. While health care professionals currently regard pain as a multidimensional phenomenon requiring assessment and treatment, our knowledge regarding the role of parental presence in ameliorating painful experiences for infants and children is limited. Parental presence at induction of anaesthesia is desirable if it makes the child happier and more cooperative. Hospitalization can be an unpleasant experience which has marked effects on a young child. Parent’s presence in the operation theater when babies are being anesthetized has been shown to be beneficial to the babies. By allowing the children to remain calm and cooperative, a smooth and easy induction is ensured. What is not well studied, however, is the stress this causes to the parent and whether they are upset by this experience. Therefore, while the presence of the parent is beneficial to the offspring, it is equally important to evaluate their attitude towards witnessing their children being anesthetised.

Most surgeons and anesthetists are reluctant to allow parents inside the operation theater when children are being anesthetized. The anesthetists’ reluctance may originate from being "watched" by the parents and the fear of something going wrong. There is also a concern that it may cause undue anxiety and stress to the parents. This is specially so in India where the parents may come from rural areas or belong to low socio-economic/educational status. Also, it has been shown in one study that the presence of highly anxious parents in the theater may upset the children. Kain and co-workers reported that the majority of parents (>95%) preferred to have comprehensive information concerning their child’s perioperative period, including information about all possible complications and Preoperative preparation programs have been demonstrated to be efficacious in the treatment of parental anxiety.

Till date no study has been done in Rural India which simultaneously says that the parent’s presence helps in induction of anaesthesia in children & how anxious the parents get and their attitude towards anaesthesia. We have done this multi centric study to analyze the data from all over the population to minimize the bias. We have done this study because it is painful to do pediatric induction in the operation theatre without the presence of parents & it is difficult to see children crying in front of you when you are trying for intravenous cannulation. So we decided to do induction of pediatric patients in presence of the parents and to see if there was any difference.

This study was, therefore, carried out to evaluate the effects of parent’s presence on induction of anaesthesia in pediatric population and the effects on parents when they watched their children being induced in the operating room, and to see whether this practice can be recommended.

MATERIALS AND METHODS

We took a total of hundred Indian rural pediatric patients after ethics committee approval. The patients were divided into two groups, a "treatment" group, in which the parent was to be present at the induction of anaesthesia, and a "control" group, in which the parent was separated from the child at the door of the operating room suite in the usual manner. All children were classified as American Society of Anesthesiologists physical status I or II, between the ages of 2-10 years, and were scheduled for elective ambulatory surgery.
Fifty parents (either mother or father) whose children were undergoing elective general anesthesia for various surgical procedures were evaluated. The parents were not prepared beforehand for accompanying the child into the theater. The decision as to which parent would accompany the child was left to them. It was then explained to them that their presence in theater would be beneficial for their child. Their written consent was required in order to take part in the study.

Measurement of the pulse rate was taken as the simplest, non-invasive test of anxiety and the physiological response to stress. The pulse rate of the parent was recorded in the pre-operative room and again during the induction. This was done unobtrusively by a staff nurse or a lady doctor in case of mothers and male doctor in case of fathers.

After induction they were escorted out of the operating room. The parent's reaction of the entire experience inside the theater was noted. Their attitude was classified as: (a) appreciative and keen, (b) calm and composed, (c) anxious, (d) upset/cried or (e) hysterical/fainted. This assessment was made by a resident doctor not directly involved with the study.

We assessed child's behavioral responses by and BEHAVIOUR QUESTIONNAIRE (BQ).

The assessment of behavioral changes as a result of the child's hospital experience was made by the BQ. This was administered first at the preoperative assessment clinic and then by telephone, one week postoperatively. This measure uses responses to a list of 28 questions compiled from inter correlated observations of changes in psychological symptoms, such as enuresis, night terrors, or the need for a pacifier.

Parents assessed the responses on a score of 1-5, if the child "never demonstrated that behavior" or if the "disturbance was present most of the time." Some questions were omitted or modified to ensure that the questionnaire was appropriate for the child's age. Changes in the responses before and after hospitalization were assumed to be the result of the hospital experience. The mean of the totals scored was used for further analysis.

On the day of surgery, after all parents were informed with a standard detailed information, demographic data about the child and parents were obtained. For all children, BQ was filled by the mother for determination of any preoperative behavior disturbances. Premedication (midazolam 0.5 mg kg\(^{-1}\) intranasally) was administered to all children at least 20 minutes before the surgery. The children in Control Group were taken to the operating room alone while those in Treatment Group were taken with their mothers. After routine monitoring, all children’s non-invasive blood pressures, oxygen saturation values and heart rates were recorded. Anesthesia was induced using 60% nitrous oxide in oxygen and sevoflurane 6-8% via a mask and vecuronium 0.1 mg kg\(^{-1}\) was administered to facilitate orotracheal intubation. The anesthesiologist graded the level of the child’s stress at anesthesia induction with a four-point scale (Table I). Anesthesia was maintained with 60% nitrous oxide in oxygen and sevoflurane 2-4%, and fentanyl 1 µg kg\(^{-1}\) was given if needed. Before completion of surgery, intravenous 0.25 mg kg\(^{-1}\) metoclopramide for its antiemetic effect were given. Residual neuromuscular blockade was reversed with neostigmine 0.03 mg kg\(^{-1}\) and atropine 0.01 mg kg\(^{-1}\). When the patient’s respiratory effort was
adequate and the patient responded to verbal commands, the trachea was extubated. Patients whose Aldrete scores were greater than 7 were discharged from the recovery room.

Table I: Children’s Stress Levels at the Moment of Induction of Anesthesia (Four-Point Scale)

<table>
<thead>
<tr>
<th>Score</th>
<th>Four-Point Scale</th>
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<tbody>
<tr>
<td>1</td>
<td>The child is agitated, crying and not cooperative.</td>
</tr>
<tr>
<td>2</td>
<td>The child is agitated but cooperative.</td>
</tr>
<tr>
<td>3</td>
<td>The child is calm and awake.</td>
</tr>
<tr>
<td>4</td>
<td>The child is sleeping.</td>
</tr>
</tbody>
</table>

Statistical analysis

Data were initially tested for skewness and found to be normally distributed. Thus, parametric analysis was used. The changes within each patient and between groups were examined using a repeated measure ANOVA. All values are reported as mean ± SD. The score on the first time a measure was tested was used as the baseline for comparison with each subsequent value. For all analyses age was used as a covariate as it was expected to be a significant factor in the results.

RESULTS

One hundred patients, aged 5.1 ± 1.7 (mean ±SD) yr were studied. They included more boys than girls, with a male: female ratio of 1.73. There were 50 patients each, in the treatment and control groups, which were comparable in age (4.9±1.5 yr and 5.2±1.8 yr respectively), sex and previous hospitalization.

All children remained calm during induction of anesthesia. There were no significant differences between the treatment and control groups on the measure tested preoperatively i.e. The observed anxiety score by four point scale is (2± 0.8 and 2± 0.7).

One week after surgery increased behavioral upset (BQ: \( P < 0.0001 \)) in the children, compared with the preoperative values, were demonstrated. These changes were the same in both groups. Behavioral changes showed no significant correlation with age (BQ: \( P > 0.05 \)).

There was no instance when both parents refused to go in. Of the 50 parents, none had visited the operation theater ever before. The age range of parents was 20 to 35 years. Twenty six mothers and twenty four fathers participated in the study. Most parents came from a rural home, were at best educated to primary school and belonged to low to low-middle socio-economic status. The pulse rate variation of the parents before and during induction is shown in Table II. Five (10%) parents showed a substantial rise in pulse rate (an increase of more than 15% from baseline); there was no change in 10 (20.0%); 23 (46%) parents had an increase by upto 15% of the baseline pulse rate while 12 (24%) parents showed a decrease in pulse rate.
The parents' attitude towards their presence inside the theater is summarized in Table III. In all, 45 (90%) parents tolerated the experience well. None of the parents became hysterical or fainted.

**TABLE II-Pulse Rate Variation of Parents (n=50).**

<table>
<thead>
<tr>
<th>Pulse Rate Variation</th>
<th>Number</th>
</tr>
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<tbody>
<tr>
<td>No change</td>
<td>10</td>
</tr>
<tr>
<td>Increase by upto 15% of baseline (mean 7.8%, range 2-15%)</td>
<td>23</td>
</tr>
<tr>
<td>Increase more than 15% (mean 36.6%, range 25-57%)</td>
<td>5</td>
</tr>
<tr>
<td>Decrease (means 11.9%, range 2-19%)</td>
<td>12</td>
</tr>
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</table>

**TABLE III -Parents Attitude during Induction (n=50).**

<table>
<thead>
<tr>
<th>Attitude</th>
<th>n (%)</th>
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</thead>
<tbody>
<tr>
<td>Appreciative and keen</td>
<td>25 (50)</td>
</tr>
<tr>
<td>Calm and composed</td>
<td>15 (30)</td>
</tr>
<tr>
<td>Anxious</td>
<td>5 (10.0)</td>
</tr>
<tr>
<td>Upset/crying</td>
<td>5 (10.0)</td>
</tr>
<tr>
<td>Hysterical/fainted</td>
<td>0 (0.0)</td>
</tr>
</tbody>
</table>

**DISCUSSION**

Minimizing children's separation from their parents is an important component of day surgical care. However, the results of this study show that the presence of a parent during induction of anaesthesia is not always beneficial. Our study showed concordance with the study of Kain and coworkers who reported that parental presence at anaesthesia induction has no beneficial effect on child's anxiety. Whereas one study done in Britain reported that parental presence decreases the child anxiety, increases cooperation and benefit both the parents and the anesthesists and earlier studies done by Schulman et al. and Hannallah et al. also reported same results while observations by Hickmott et al. suggested that a parent does not always influence a child's mood at induction.

The most upset group of children at induction of anaesthesia were those who were accompanied by extremely anxious parents; and the level of parental anxiety preoperatively was reflected in the children's behavior and fears one week later. The presence of "calm" parents at induction made no difference to the children, but for some of these parents it was helpful in decreasing anxiety afterwards. The highest levels of anxiety were demonstrated in those anxious parents who were present at induction.

Studies of this nature are difficult to design. Anxiety and behavioral responses resulting from hospitalization have complex and multifactorial origins. Short hospital admissions of less than a week may produce little disturbance in healthy children, while the mother's presence sometimes has an adverse effect on the child's behavior during hospital procedures. Younger
children (one to five years old) show greater emotional reactions to preoperative hospitalization than older children\textsuperscript{16,17}.

The presence of a parent during induction of anaesthesia is frequently requested and might alleviate emotional stress in some families. Therefore, it is important to organize day-care facilities so that parents can be present at induction without disruption to the operating room schedule. As shown in our study eighty percent of the parents were extremely cooperative and their presence at induction is helpful. If a simple assessment of parental anxiety levels is made part of routine preoperative evaluation, the "anxious" and "calm" parents could be identified. Appropriately concerned parents may then be allowed to accompany their children at induction if they wish, whilst highly anxious parents should be excluded and offered additional counseling and support\textsuperscript{2}.

The benefits of the parent's presence during anesthesia induction in children have been shown by various authors\textsuperscript{5,6}. This practice helps in ensuring smooth induction with the child remaining calm and quiet. The parents experience of visiting the theater and witnessing induction of their child has not been well evaluated. While some studies have shown unequivocal benefit to the child, others have concluded that parental presence may be beneficial to the child if the parents themselves are calm, but not so if they are highly anxious\textsuperscript{2,5,6}.

Surgeons and anesthetists alike, generally presume that the parents would not be able to withstand the strange theater environment, especially when their own child is about to be operated. But is it true that this experience is more traumatic than the unwilling or forceful separation when their child is being taken away from them into the operating theater?

The pulse rate recording, in the present study did not show significant variation before and during induction. There was a rise in pulse rate in 17 parents of whom 14 showed only a marginal rise. Most parents (90\%) tolerated the experience well. Vast majorities (80\%) of the parents in our study remained calm and were keen to be present inside theater in contrast to another study where only 47\% remained calm\textsuperscript{2}. Almost half (46.7\%) showed keenness to go in and would do the same if required another time. This keeness to be present in the operation theater has been reported by others\textsuperscript{5,18}. Ten per cent were anxious and another 10\% were upset. This may have been because the parents had not been adequately prepared beforehand.

Most of the parents in this study were educated at most up to primary school level only and belonged to low socio-economic strata. This suggests that low educational background and social status did not materially influence their attitudes to the event.

This is in contrast to an earlier study in which parents’ selection and education were reported to be important factors\textsuperscript{5}. Our results indicate that the parents like to be with their child during anesthesia induction and seem to prefer a more gradual separation from their child.

**CONCLUSION**

This study has shown that the parents’ presence in the operating theater is safe and the surgeon's feelings to the contrary are largely unfounded. This practice is good for the child and is well
tolerated by the parents and in our opinion, should be a routine practice in all pediatric surgical theaters but it has no additive effects in terms of reducing the child’s anxiety or postoperative behavioral changes.

REFERENCES