Special Article

The Use of Motion Pictures in the Psychological Preparation of Children for Induction of Anesthesia

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Prior research on the treatment of phobias and the psychological preparation of children for operations suggested that the stressfulness of anesthesia induction might be ameliorated by a short motion picture showing children behaving calmly during induction. This was tested in a controlled experiment with 38 children undergoing minor elective operations. The anesthetics employed were standard combinations of halothane, nitrous oxide, cyclopropane and oxygen. Children who saw the film shortly before leaving for the operating room were judged to be significantly less upset than the controls while waiting to enter the operating room and while being readied for induction. The differences between the two groups during the induction itself were negligible. (Key words: Psychologic responses: motion pictures, effect of; Anesthesia, pediatric: psychologic preparation.)

The present study has explored the usefulness of a motion picture film as a means of preparing young children psychologically for induction of anesthesia. Two lines of prior research lead to the hypothesis that a film showing children behaving calmly during induction would reduce the stressfulness of that procedure. First, Bandura and his colleagues12 found that children who were very afraid of dogs and who saw a film showing a series of children playing with friendly dogs became much more able to approach and play with dogs themselves than did the children in control groups who received no such preparation. A second line of research dealt with the psychological preparation of children for hospitalization and surgery.39 While these studies were less well controlled than the research on phobias, the overall findings clearly suggest that accurate information about the events surrounding an impending operation reduces the patient’s distress a significant degree.

Methods

The hypothesis was tested in an experiment involving children undergoing elective operations. A preparation film was constructed which showed a sequence of four children who behaved without visible emotion while they were wheeled into an operating room, were moved from cart to table, and received anesthesia by mask until they were asleep.

The general procedure of the experiment was that the subjects were divided into an experimental group which saw the film approximately 45 minutes before their own operations and a control group which did not. The subjects were observed from the time they entered the operating suite until a surgical level of anesthesia was achieved. Ratings of the children’s mood were made throughout this period.

Subjects

The 38 children were under the care of two physicians, one (WCB) a pediatric surgeon and the other (SF) an otorhinolaryngologist. Children who were patients of the pediatric surgeon included nine inguinal herniorrhaphy patients and seven having other
forms of minor elective operations. The patients under the care of the otorhinolaryngologist included 19 children having tonsillectomies and adenoidectomies and three having myringotomies alone.

The children ranged in age from 4 to 9 years (mean 6½ years).

For efficiency, and because of the physical set-up of the hospital ward where the children were housed, all the children of a particular surgeon who were having operations on the same day were given the same treatment, either experimental or control. The assignment of these groups to treatments was randomly determined. Prior to treatment assignment the investigator had no contact with the children or their parents and no information about them apart from age and sex.

The resulting experimental and control groups were of similar composition with respect to mean age (6.0 and 5.6 years, respectively) and sex (the experimental group contained 13 boys and six girls; the control group contained 12 boys and seven girls). They were also similar in types of anesthesia employed and prior experiences with general anesthesia. In the experimental group the numbers of patients anesthetized with 1) halothane, nitrous oxide and oxygen, 2) halothane and oxygen, and 3) cyclopropane, halothane, nitrous oxide, and oxygen were, in turn, seven, nine, and three. The corresponding figures for the control group were eight, ten, and one. The numbers of children who had had prior experience with anesthesia were four in the experimental group and two in the control group.

The two groups did differ somewhat in the preoperative medication. In the experimental group ten children received a combination of meperidine and atropine and two received atropine alone. The corresponding figures for the use of these combinations in the control group were almost the reverse—i.e., one and nine. (The combination of meperidine, diazepam, and atropine was used in six experimental cases and nine control cases. In addition, the combination of pentobarbital sodium and scopolamine was used in one experimental case.) The effect of this unanticipated discrepancy on the results is discussed below.

TREATMENTS

The Experimental Condition (The Preparation Film)

The film showed four children responding calmly to mock anesthesia induction. In each case the child was shown being wheeled into the operating room by an aide in surgical mask and cap and being moved from the cart to the operating table by the aide and a nurse (also in mask and cap). The anesthesiologist, who was seated at the head of the operating table, placed a blood pressure cuff on the child’s arm and a stethoscope on his chest. He then tried a rubber mask on the child’s face for size and attached it to an anesthesia machine which was visible at his side. He placed the mask over the child’s face, holding it with one hand for a minute or two, and then removed it when the child was apparently asleep. While this was going on, the nurse, who remained in the picture, attached a strap across the child’s thighs, took his two hands in her hands, and leaned lightly across the child’s upper torso in the manner common to nurses in pediatric surgery. The nurse let go of the child and straightened up when the anesthesiologist removed the mask.

The four children in the film were actors (the children of colleagues). There were two boys (ages 8 and 5 years) and two girls (ages 9 and 5 years). During the entire sequence they showed no emotion at all apart from an occasional faint smile.

The film was realistic (except for the children’s behavior, which cannot be described as typical). It was made in the operating rooms of the hospital where the research was conducted and used hospital personnel. The equipment which was visible was standard and the techniques employed similar to those used by many anesthesiologists.

The children saw the movie just prior to preoperative medication. The film was shown in a small treatment room near the subjects’ ward. Parents were not present.

Before the start of the film, the investigator told the children that they were going to see a movie which would show them what they would see when they had their own operations later in the morning. Several other comments were made routinely. The entrance of each new child on the screen was noted.
("There's a new one—it's a boy"), as was the anesthesiologist's placing the mask over the child's face ("Now he's putting the mask on to help the child go to sleep."), and, a bit later, the fact that the child was asleep ("Now he's asleep."). Finally, at the end, the investigator mentioned the fact that the sequence was repetitive ("They were all just the same, weren't they?"). The entire film lasted 12 minutes (3 minutes per induction). The children's attention to the film was invariably excellent; they watched quietly and intently. The questions which they asked (e.g., "Is that what's going to happen to me?") were appropriate in all cases. After the film the children returned to the ward and their parents.

The Control Condition

The children who did not see the movie sat with their parents and chatted, read, etc. Apart from the movie and associated activities (e.g., contact with the investigator) the experiences of the two groups were seemingly identical and in no way different from the experiences of other children having the same operations in that hospital. Neither the surgeons nor the anesthesiologists involved knew to which groups the children were assigned.

Assessment of Responses

The children's behavior before and during induction was rated on a seven-point scale (the "Global Mood Scale"), the intervals of which ranged from "attentive and active in happy or contented way and/or interested in play or other constructive activity" (scored "1") to "scream full blast; intense and constant crying without paying attention to anything" (scored "7").

The period from the subject's entry into the operating room until a surgical level of anesthesia was reached was divided into four phases:

1) Threat Phase A, from entry into the operating suite until the child started to enter his operating room.
2) Threat Phase B, from entry into the operating room until the beginning of induction of anesthesia (marked by the mask being placed over the child's face).
3) Impact Phase A, the first minute of induction of anesthesia.
4) Impact Phase B, the last part of induction of anesthesia, from the end of Impact Phase A until a surgical level of anesthesia was reached.

Each child received a score indicative of his mood during each of the above four phases. This application of the Global Mood Scale was similar to that of prior research in hospital stress situations. Prior research has indicated an acceptable level of interjudge reliability for such applications, and in addition has provided data supporting their validity. For example, Torrance reported that agreement on assigned ratings between pairs of independent observers ranged from 79 to 91 per cent after a modest amount of training. The subjects here were children undergoing injections. Torrance also made intrapersonal comparisons of Global Mood Scale ratings with telemetered heart rates over a series of 41 children undergoing injections. The resulting intrapersonal correlations had median values of .43 and .47 (P < .05 in both cases), providing modest support for the validity of the scale.

Additional data on the children's mood while in the operating room was provided by ratings made by the participating anesthesiologists in response to the question: "Compared with other children of about the same age and condition, how did the patient appear to behave to you?" Five response alternatives were provided, ranging from...
"much less frightened and upset than average" (scored "1") through "much more frightened and upset than average" (scored "3"). At the time of the ratings the anesthesiologists were unfamiliar with the subjects' treatment conditions.

**Results and Discussion**

The experimental and control groups were compared on three variables which might have confounded the critical comparisons, age, sex, and type of operation. In no case did the differences approach statistical significance; the two groups were reasonably well balanced in these incidental variables.

The data on the children's mood during the four phases were analyzed separately by analyses of variance (table 1).

According to these data the general expectations prompting the study were reasonably well supported. This seemed to be particularly so for the children's behavior just prior to the induction itself (Threat Phase A and Threat Phase B). On these occasions the children who had seen the preparation film appeared significantly less upset than those who had not seen the film. The difference, which was apparent in initial Global Mood Scale ratings (Threat Phase A), dwindled and finally disappeared. Thus, during Impact Phase A the difference only approached significance (.10 > P > .05, two-tailed test), and during the ensuing period of induction (Impact Phase B) differences were almost nonexistent.

The ratings of the anesthesiologists correlated significantly with the Global Mood Scale data for Threat Phase B and Impact Phase A (r = .46 and .53 respectively, N = 38, P < .01 in both cases). However, the difference between the prepared and unprepared subjects was not statistically significant (F = 2.45, P > .10), perhaps because these ratings covered a larger time span which included Impact Phase B (a period during which most subjects were asleep and variation was almost nonexistent) as well as the earlier phases.

In retrospect, it seems possible that this waning of differences was the result of a variable "fit" between the expectations created by the preparation film and the children's subsequent experiences. Thus, the fact that the differences between the prepared and unprepared children diminished in the initial minute of induction (Impact Phase A) may have been the result of the expectations of the prepared children being unfulfilled by their experiences at that time. It seems likely that the incidence of unexpected sensations was greater at this time than during the prior phase. Although the movie showed the mask being placed over the models' faces, it made no attempt to characterize the odor of the anesthesia or sensations which the anesthesia created.

It is noted above that the experimental and control groups differed somewhat with respect to certain preoperative medications. In the experimental group the combinations 1) meperidine and atropine and 2) meperidine, diazepam, and atropine were relatively common (N = 16), while atropine alone was relatively uncommon (N = 2). The corresponding figures for the control group were 10 and 9, respectively. As one might anticipate, the Global Mood Scale data did suggest that
these differences in mediation influenced the subjects’ behavior during those phases in which large overall experimental effects were evident (Threat Phase A, Threat Phase B, and Impact Phase A). Considering the experimental and control groups separately, in five of six comparisons the children receiving atropine alone were more upset, on the average, than the children receiving an atropine-sedative combination. Only in the data for the experimental group during Threat Phase A did the atropine-sedative-combination group appear more upset than the atropine-alone group, and in this case the difference was slight (2.2 and 2.1, respectively).

However, looking at the Global Mood Scale data for these three phases and controls for type of preoperative medications (by comparing only children with the same medication combinations), it still appears that viewing the film had a substantial effect. The 16 children in the experimental group who received either 1) meperidine, diazepam, and atropine or 2) meperidine and atropine had mean Global Mood Scale scores of 2.2, 2.2, and 3.1 for the three phases. The corresponding figures for the ten control subjects who received the same medications were 3.4, 4.2, and 4.3. Further, the two experimental-group children who had atropine alone had mean mood scores of 2.1, 4.5, and 4.0 for the three phases; the nine control-group children receiving this medication had corresponding means of 4.0, 4.3, and 4.6. Thus, with one exception (atropine alone, Threat Phase B), when one controls for type of preoperative medication, the children who received the special preparation appeared less upset. Thus, although the experimental and control groups were imbalanced in preoperative medication, and although the type of premedication seemed to influence the children’s behavior during prior to induction, these facts cannot account for or explain the overall ameliorative effects of viewing the preparation film.

Although the film techniques used here seemed generally effective, it is clear that changes or additions might have increased their practical value. In this regard it should be emphasized that the children in this study were prepared for only a part of their total experience—only for induction of anesthesia and to the extent that they could be prepared with a purely visual presentation. Had the prepared children also been prepared for the non-visual sensations of the anesthesia, they might have experienced more impressive benefits.

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References