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Preoperative distraction in children: hand-held videogames vs clown therapy

Clowntherapy as non medical approach to manage preoperative anxiety in children

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Introduction

Anxiety in children undergoing surgery is characterized by feelings of tension, apprehension, nervousness and fear which may manifest differently. Postoperative behavioural changes such as nocturnal enuresis, feeding disorders, apathy, and sleep disturbances may stem from postoperative anxiety.[1] Some Authors pointed out that over 60% of children undergoing surgery are prone to developing behavioural alterations 2 weeks after surgery.[2,3] Variables such as age, temperament and anxiety both in children and parents are considered predictors of such changes.[1] Studies were published describing how psycho-behavioural interventions based on play, learning and entertainment in preparing children for surgery, may reduce preoperative anxiety.[4]

Clown-therapy is applied in the most important paediatric facilities and has proved to diminish children's emotional distress and sufferance, as well as consumption of both analgesics and sedatives and to facilitate the achievement of therapeutic goals.[5,6,7]

The aim of our study was to evaluate the efficacy of clown-therapy during the child's hospital stay, with a view to optimizing treatment and care, preventing behavioural alterations and enhancing the child's overall life quality.

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Methods

At the Chair of Paediatric Surgery from the University of Siena, in collaboration with the Anaesthesiology and Intensive Care Unit II, an experimental project was carried out of "hospitalization and anaesthesia methodology" aiming at easing the child's hospital stay, and assessing the qualitative and quantitative therapeutic results of "laughter therapy". This study was approved by the Institutional Review Board of the University of Siena, and the written informed consent was obtained from all parents of the subjects. 885 paediatric patients (634 males and 251 females) were enrolled, referred to us for elective surgery, age range 5 to 12 years. Patients were divided into 2 different groups: a *study group* comprising 444 children (310 males and 134 females) who were accompanied by clowns to the operating room, and a *control group* comprising 441 children (324 males and 117 females) who were not accompanied by clowns. Inclusion criteria of the study population were: grade 1 or 2 of anaesthesia risk (ASA-1 and ASA-2), age range 5-12 years for both genders, application of the Modified Yale Preoperative Anxiety Scale (m-YPAS) which uses an observational behavioural form for determining the child's anxiety level in the preoperative period and in two different locations (waiting room and anaesthesia induction room).[4,5]

As defined in the study protocol, children were first met for the preoperative anaesthetic assessment. At the same time parents were being informed on anaesthesia methodologies, hospitalization and the experimental character of this study. Upon admission, the control group patients were greeted to the ward by the on-call physician and the nurses whose task was to help them relax by informing them on the upcoming diagnostic and therapeutic procedures and the available toys and movies in the operating room. At the moment of surgery, the control group patients were accompanied by a nurse and one of their parents to the operating room where they could play or watch a cartoon prior to anaesthesia induction.

The study group patients were greeted to the ward by the on-call physician and the nurses who tried to raise their interest in the new experience having their attention focused on the clown's presence

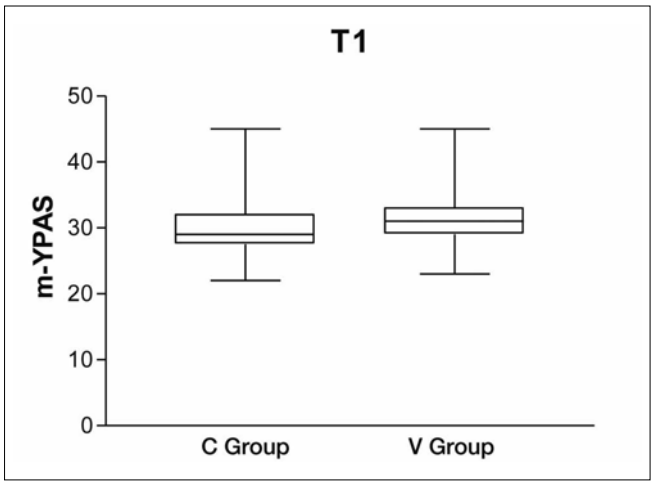

Figure 1.
Evaluation of preoperative anxiety scale m-YPAS at T1. P value=0.0018; difference between means=-1.637± 0.5182; 95% confidence interval=0.6217 to 2.653; R squared=0.04992

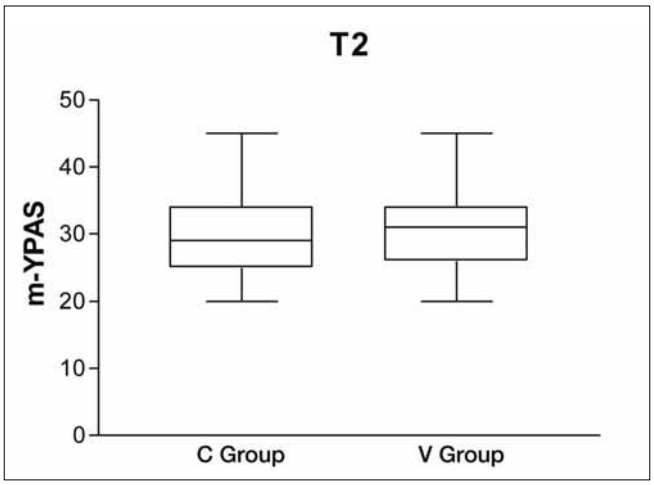

Figure 2.
Evaluation of preoperative anxiety scale m-YPAS at T2. P value=0.1558; difference between means=-1.055 ± 0.7401; 95% confidence interval= -0.3959 to 2.505; R squared=0.01058

Table 1
STATYSTICAL PARAMETERS AT T1 EVALUATIONS.

Parameters		Group C	Group V
T1	Range m-YPAS	22-45	23-45
	Mean m-YPAS	29.48	31.12
	Median m-YPAS	29.00	31.00
	Std. Deviation m-YPAS	3.667	3.507
	Std. Error m-YPAS	0.3704	0.3617

Table 2
STATYSTICAL PARAMETERS AT T2 EVALUATIONS.

Parameters		Group C	Group V
T1	Range m-YPAS	20-45	20-45
	Mean m-YPAS	29.29	30.34
	Median m-YPAS	29.00	31.00
	Std. Deviation m-YPAS	5.500	4.705
	Std. Error m-YPAS	0.5556	0.4853

and the possibility to watch movies and play videogames with him. On the day of surgery, the clown and one parent accompanied the child to the operating room involving him/her in a playful competition to eliminate any source of stress.

Two observer physicians evaluated the children's immediate reaction in both groups, their relationship with their parents and the surrounding environment, by means of the m-YPAS items.[3,4]

The same anaesthesiology protocol was adopted for both groups and included pre-anaesthesia and either intravenous or inhalatory anaesthesia. The drug of choice for paediatric pre-anaesthesia is Midazolam, a short-acting benzodiazepine which can be antagonized with Flumazenil in case of overdose (0.05 mg/kg).

All the patients were evaluated in 2 different moment: in the waiting room, 10 minutes before the surgery (T^1) and at the induction (T^2).

Results

The demographic and clinical characteristics of the 2 groups of children are presented in Tables 1. There were no significant differences between the two groups for age, ASA grade and surgical procedures. Our main endpoint has been to value preoperative anxiety in the child measured by m-YPAS and see if there is any difference between the 2 groups. In the waiting room (T1) the clown group had a statistically significant lower m-YPAS score (P=0.0018) (figure 1). As the table 2 shows group C median value of the mYPAS test was 29.00 (range 22-45; standard deviation 3.667) while group V median value of the mYPAS test was 31 (range 23-45; standard deviation 3.507); there were no significant differences (P=0.1558) between the groups during the induction of anaesthesia (T2) (figure 2). As table 3 shows group C median value of the mYPAS test was 29.00 (range 20-45; standard deviation 5.500) while group V median value of the mYPAS test was 31 (range 20-45; standard deviation 4.705). During the collection of the data, we decided to evaluate the relationship between the type of anaesthesia and the two different types of distraction therapy. 333 (33.81%) patients received an intravenous anesthesia induction, 168 (17.06%) in the group C and 165 (16.75%) in the group V, while 652 (66.19%) an inhalation one, 330 (33.50%) in the group C and 322 (32.69%) in the group V. The mean value of m-YPAS, in the patients receiving an intravenous anesthesia induction, was 25 (group C) and 26 (group V); in the patients receiving an inhalation anesthesia induction was 35 (group C) and 37 (group V). There was no relationship. between the type of anaesthesia and the preoperative distraction therapy (Fisher exact test: P=1.00).

Discussion

According to the Literature, 40-60% of children undergoing surgery develop preoperative anxiety[2] which may either affect or be

affected by the parents' emotional distress, thus setting up a vicious circle. Preoperative anxiety in children is also fed by fear of separation from parents and of unfamiliar surroundings;[1] it increases anaesthesia induction time and may cause postoperative behavioural changes.[8,9] Risk factors for preoperative anxiety are: pre-school age, shyness and introversion, previous hospital stays, and any preparation procedure for surgery.[10,11,12,13] Parents' anxiety is a further key factor: several studies show how it is directly correlated to the children's preoperative distress.[10,11] Several therapeutic alternatives have been proposed to alleviate anxiety in children undergoing surgery: pharmacological techniques (sedative premeditation), non-pharmacological approaches (preoperative examination held in the operating room), presence of one or both parents during induction of anaesthesia, psychological preparation, and use of music and toys as distraction tools.[11] Some studies highlighted how preoperative administration of Midazolam diminishes anxiety during the anaesthesia induction procedure, although oral intake of drugs as premedication may often generate the child's apprehension, reluctance or even rejection.[8]

Some Authors pointed out how children provided with psychological preparation at least 5 days prior to surgery, proved less susceptible to anxiety: this especially emerges in the m-YPAS test selected age range (5-12 years), since children at this age request to be more extensively informed about what they are just about to face.[1,10,11,14]

Clown-therapy is a recent therapeutic acquisition which brought clown doctors into paediatric hospital wards. The first professional clown doctors appeared in New York in 1986, thanks to Michael Christensen, within the framework of a program called "Big Apple Circus Clown Care Unit".[5,15]

In the Literature, only one study has been published which emphasizes the potential benefits of the clown's presence during anaesthesia induction. Vagnoli et al encourage this therapeutic approach for preventing anxiety, though they underline how the medical and paramedical staff's objection to it might hinder its inclusion among the operating room activities.[16]

In our facility, clowns usually work in groups of 2 or 3, twice a week, actively involving patients, parents and the hospital staff. The clowns aim at entertaining children and parents during their hospital stay and accompany them to the operating room.

Our study aimed at comparing 2 methods of approach to surgery, one based on play (also with the aid of a multimedia station) and a second one on the clown's active participation.

The most indicated and common test for measuring preoperative anxiety in children undergoing surgery, is the m-YPAS test:[1, 10, 11, 14] though setting age limits, it allows to describe the patient's behavioural reaction preoperatively by using specific items and to obtain a score for determining his/her anxiety level. Several studies by Kain et al validate the test from the point of view of methodology and results in the different study populations.[1,10,11]

The study group patients proved less anxious then those in the control group during anaesthesia induction. The least anxiety was detected in children who positively interacted with clowns and took part with interest in the proposed activities.

Conclusion

Our study clearly shows that a positive relationship exists between anxiety levels in the child undergoing surgery and clown-therapy, while inducting anaesthesia. The clown's action, along with validated non-pharmacological therapeutic methodologies - such as the presence of one or both parents during anaesthesia induction - may contribute to improving the paediatric patient hospital care. Still, the medical and paramedical staff's objection may adversely affect the inclusion of such a program among the operating room activities.

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