

**FORMACIÓN MÉDICA*****Hospital programs to treat childhood anxiety. Review of evidence***

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ABSTRACT

The WHO defines health as the state of physical, mental and social well-being and not only the absence of disease. It is for this reason that we must take care of the implications of the surgical activity beyond the physical ones. Some authors say that only anesthetic induction produces clinically visible levels of anxiety in 40-60% of patients undergoing anesthesia.

This fact is more evident in the child population where the mechanisms of protection against stressful situations are not very developed. To address this question it is necessary to offer hospital staff efficient tools. There are preoperative preparation programs and some distraction techniques that work, but they have limitations and their particular benefits.

The hospitals who want to implant a program that helps children face the surgical process must do it based on the scientific evidence. The main problem is the great heterogeneity that exists between the different studies. This is because there are a great amount of variables involved in the psychological processes of the humans.

The authors determined the effectiveness and origin of current surgical preparation programs by evaluating previously studies in the databases: MEDLINE, Web of Knowledge, COCHRANE, EMBASE published up and to december 2016 with no year of restriction. We included studies evaluating child perioperative anxiety that were randomized studies and had a score of 4-5 on the JADAD scale.

Introduction

There are still few hospitals that consider it important to include in their services a program that helps to decrease the level of anxiety in the patients. However, recently it is possible to find different initiatives and programs in the pediatric area for this purpose. Initiatives born under the current "humanization of hospitals" trying to achieve, with greater or lesser fortune, a closeness and better assimilation of the surgical protocols present in a hospital. Personally we believe that there is nothing more human than to exercise our office. Exercising medicine and curing a disease implies humanity in itself, even if it is applied under scientific evidence and seeking an adequate effectiveness. There is

nothing more human than the fact of healing others, although in that way science is prioritized over comfort and closeness. Therefore, the authors are in favor of the new, and poorly called, humanization of health but, first ensuring, proper care.

We are therefore witnessing the birth of proposals and initiatives that try to reduce the anxiety level of our smaller patients, who try to bring our medical activity closer to the daily life and try to transform the instrumentalization and modernization of medicine into something understandable to all. Something positive and desirable.

However we can not forget that medicine is based on the scientific method, and that

without it, these initiatives can remain in a mere superficial marketing. They may even endanger the performance and health outcomes of the health care activity itself. This does not mean in any way that the aspects that concern the psyche and the emotional part of the patient are not important. In fact they are a fundamental part of the medical activity but always from a scientific and consensual point of view.

That is why it is always desirable to quantify results and evaluate aspects that aim to improve our work. In the case of childhood preoperative anxiety, initiatives and protocols have been developed that try to alleviate the causes and their consequences. The development of stories, toys, the presence of parents in anesthetic induction and other actions seem to be a current trend developed by some hospitals concerned about this issue. But what is the truth about it? How are these initiatives properly developed? And above all ... What is true in all this?

Defining the problem: anxiety and surgical stress

The term anxiety comes from the Latin *anxietas* (anguish, distress) and is defined as the response of the body's involuntary anticipation to different stimuli, both external and internal, that are perceived by the individual as threatening or even dangerous. These feelings are accompanied by unpleasant sensations or somatic symptoms of tension. It is, therefore, a warning sign that warns of imminent danger and allows us to take the necessary measures to face a threat.

The so-called adaptive (or non-pathological) anxiety is a normal emotional state and constitutes a habitual response to everyday stressful situations, being necessary to be able to handle us in the environment. But when that state surpasses a certain intensity and originates an imbalance of the systems of response managing to surpass the adaptive capacity between the person and the environment is when the anxiety becomes pathological. This pathological anxiety causes a significant and true clinical malaise with

the appearance of physical, psychological and behavioral symptoms, most of the time very unspecific.

Search criteria

A search was made in December 2016 in the databases MEDLINE, Web of Knowledge, COCHRANE, EMBASE. Several combinations of the following terms were used in Spanish and English: preoperative, anesthesia, anxiety, stress, and pediatrics. No year of restriction. We included studies evaluating child perioperative anxiety and were randomized studies, with a score of 4-5 on the JADAD scale. For the review of the articles a template was created that collected the author, the year, the number of participants, the main objective of the study, its results and if the article had been referenced later.

HOW TO MEASURE ANXIETY AND SURGICAL STRESS

One of the major problems facing the evidence on this subject is the difficulty in finding a measuring instrument that is valid, reliable and unique. Finding a way to measure anxiety or stress and to allow comparison of results is complicated. In this review we observe how the studies with the appropriate scientific quality use different tools of valuation of the level of anxiety of its individuals. The first step is, therefore, to enumerate the different measurement tools that are added to different satisfaction surveys, although the latter are generally not adequately validated. It is also possible to find, in a specific way, some physiological variable as an indirect measure of the level of anxiety.

Validated anxiety and stress scales

- Status-trait anxiety questionnaire (STAI)
- Hamilton's anxiety scale
- Goldberg's anxiety and depression scale (EAD-G)
- Child behavior checklist (CBCL) and Achenbach's Youth Self Report
- The Yale Preoperative Anxiety Scale (YPAS-m)

- Visual Analogue Scale of Pain or Visual Analogue Scale (VAS) by Scott Huskinson
- Corah Anxiety Scale (DAS) and Corah Modified Scale
- Scale Amsterdam Preoperative Anxiety and Information Scale APAIS)
- The Induction Compliance Checklist (ICC)
- Pediatric Anesthesia Behavior Score (PAB)
- CEMS: Children's Emotional Manifestation Scale
- PAED: Pediatric Anesthesia Emergence Delirium
- Global Mood Scale (GSM)
- PHBQ: Post Hospitalization Behavior Questionnaire
- SAS: State Anxiety Scale
- Questionnaire of Parental Concern on Surgery CPPC

Physiological variables

- Systolic blood pressure
- Diastolic blood pressure
- Presence of ventricular ectopy
- Measurement of serum cortisol

WHAT WE KNOW ABOUT SURGICAL ANXIETY

Surgery can be a very stressful factor for children and parents. The rupture of habitual routines, the presence of an unknown medium and personnel, separation of parents and children, pain and the uncertain development of surgery (together with the anesthesia itself) are, among others, causes of this malaise capable of generate varying degrees of anxiety as discussed by Brennan in 1994 and Feldman in 1998. This fact is more striking in children, where their self-control mechanisms are not sufficiently developed to handle conflictive situations. Added to the above, the parent-child relationship is a fundamental part of the child's psychic balance and in the face of these stressful situations it is easy to find a transfer between stress and anxiety experienced by the parents towards the child (Bevan 1990), which implies taking into account both parents and children when we approach this

problem. This fact is much more striking in infants, since at this stage of life we learn to behave in unfamiliar social situations through the so-called "social reference", using the emotional information released from our caregivers.

It should also be considered that younger patients have a greater emotional reaction to hospitalization than older children. This indicates that anxiety and the response to surgical stress occur at different levels according to the patient's age. Thus, young children (1-3 years old) have greater social isolation and develop greater interpersonal dependencies with the usual close people. So their limited life experience does not protect them from the hospital experience. Preschool children (3-5 years) do not have abstract logical thinking and present a very limited concept of time, this, added to the magical infantile thought can condition that these patients are taken as a traumatic punishment surgical experience. School-aged children (6-10 years old) already have a more developed logical thinking with more realistic experiences presenting a concern more in line with the disease itself and the separation of its habitual circle. Finally, adolescents seem to need more privacy and independence than adults, with a striking development of concerns related to loss of control.

Benefits of Controlling Anxiety

Some authors argue that only anesthetic induction produces clinically visible levels of anxiety in 40-60% of patients undergoing anesthesia. It appears that the reduction of stress and anxiety levels during anesthetic induction may reduce certain physiological and psychological adverse outcomes as suggested by, among others, Greenberg in 1996 and Holm-Knudsen in 1998. In the same way, that preoperative distress is associated with increased postoperative agitation and with the appearance of negative behaviors at the postoperative level demonstrating that the consequences of anxiety and perioperative distress may extend beyond the perioperative period. (Stargatt 2006)

Since the 90s of the last century, when this phenomenon began to be studied with the contribution of authors like Lui F in 1994, Moix in 1995, Kain in 1996 and Kotiniemi in 1997 among others, added to the contribution offered by more recent studies, lead us to the certainty that anxiety affects the postoperative recovery in a negative way. Such childhood anxiety affects the increase in analgesic needs, postoperative complications and increased hospital stay. Other authors also have an impact on this perioperative anxiety as the origin of different maladaptive problems after such surgery that go unnoticed for most medical staff. Up to 20% is the percentage of children's surgeries with these maladaptive problems, according to several authors, problems such as the appearance of enuresis, the appearance of night terrors, symptoms of depression, insomnia, or find again regressive behaviors that were overcome by the individual. As could be the need to use pacifier, sucking the finger, involution of language ... etc

Pharmacological premedication as an alternative

Pre-operative anxiolytic medication relieves infant anxiety, facilitates child-parent separation, and reduces disruptive behaviors in anesthetic induction (Kain 1999). It therefore seems to be the appropriate solution to this problem. However premedication has its limitations and presents certain problems that force to look for other valid alternatives.

On the one hand, premedication is not applicable to the parents and companions of the minor, who do not normally receive any type of anxiolysis, being intentionally excluded from that medical performance. On the other hand, children can refuse to take any type of medication, either masked next to another liquid or taken directly. Medication can also generate changes in postoperative behavior such as paradoxical reactions along with delays in arousal and discharge (Ullyot 1999).

Concerning the issue of safety, pharmacological premedication carries a certain risk of respiratory depression and

requires the need for better control of the child against possible injuries caused by involuntary blows to nearby furniture. For all of the above, pharmacological premedication generates a cost, both for the consumption of the different drugs used and for the increase of the staff present in the space where the administration and control of the patient is performed. All this has generated a current in different care units that try to achieve a reduction of perioperative anxiety through the use of programs and different initiatives that do not have pharmacological premedication as the main therapeutic weapon (figure 2)

Types of non-pharmacological interventions

1. Psychological (cognitive or behavioral) interventions

- Mechanisms of distraction
 - o Toys
 - o Video game
 - o Costumes ...
- Cognitive tasks
- Hypnosis
- Reality virtual
- Preconditioning experiences

2. Interventions of the environment

- Creation of play rooms
- Paintings and murals for children

3. Equipment modifications

-Accessories of disguised or hidden anesthesia

4. Social interventions

- Presence of parents in induction
- Limitation of staff in induction

5. Modification of staff communication

- Voice Tone
- Non-verbal communication
- Verbal relaxation

The use of the different types of possible interventions originate different modalities

of programs, encompassed in two large groups:

1 - Preoperative preparation programs (PPP), in charge of anticipating and preconditioning hospital experiences

2 - Actuation programs (PA), with the use of tools and actions in situ in the hospital environment

EVIDENCE OF THE DIFFERENT TYPES OF INTERVENTION

Preoperative preparation programs

Developing a child perioperative preparation program is not only a way of avoiding the deleterious effects of anxiety and stress, as demonstrated by Kain and Fortier among others, but also a way to facilitate our work as hospital staff. A program of these characteristics is a defense tool against family nuclei where some of its members are not sufficiently prepared to face certain stressful situations. The effectiveness of these programs is achieved through the preparation and preparation prior to the feelings and experiences that the child and the parents will experience during the hospital period. All through photographs, drawings, games, videos, etc ... supported by a verbal or written communication of the procedure.

It seems that the information given to both the parents and the children and to make them participate in the surgical process makes them more emotionally available. However, there are many differences between each family nucleus due to cultural diversity, different rules of affectation and emotional display, assertiveness and capacity for compression so it is impossible to find an effective type program for the general population. This forces each hospital to seek and adapt existing solutions that best fit the special characteristics of its population. To do this they must first evaluate the average compression level of the procedures and the emotional response of their population to correctly perform a preoperative preparation program.

It is also necessary to take into account the age of the child adapting it to the level of its development in such a way that the compression of the medical procedure can be realized through stories or books illustrated in the younger patients. Pre-hospital visits and preoperative classes are best suited for 6-10 year-old children, while character-specific patient videos are best suited for the adolescent patient.

Another important aspect is when to apply this program, as it depends on the level of development and the concept of time reached by the child. For this reason, it has been shown that it is advisable to apply the program in the pre-surgical night before preschool patients, whereas in the school-aged (5-12 years) patients, better results are obtained when these programs are applied one week before the procedure.

The scientific evidence on the effectiveness of this type of program was developed from 2007, with the studies of Kain and later Fortier in 2011. Through the application and study of the ADVANCE program (Anxiety-reduction, Distraction, Video modeling and education, Adding parents, No Excessive Reassurance, Coaching and Exposure / Shaping) found a positive effect on reducing the incidence of postoperative delirium, reducing discharge time, and reducing post-surgery analgesic use compared with normal use of midazolam and / or the presence of parents.

But when we specifically study the type of tools most convenient to anticipate these surgical experiences we find the usual doubt that the systematic review offers. Contradictory, for example, is the result of the visualization of videos prior to anesthetic induction, whereas Campbell in 2005 with a trial of 91 patients, it seems that the mYPAS scale decreased significantly in 31.2 points; 95% CI: 27.1 to 33.3, Berghmans, in another trial of 2012 performed with 120 children did not observe a significant reduction of such anxiety. In the latter trial, children (along with their parents) who were screened for didactic resources and video-learning in a pre-surgery period had no difference in anxiety levels for children who did not.

However, he did find differences when he exclusively analyzed anxiety levels in the parents, which showed a decrease in anxiety with these types of interventions.

Distraction techniques

Those of us who are parents we do not need to tell us that having a child distracted is the best way to stop crying and bother, but to say that distracting momentarily from a stressful situation leads to a better assimilation of anxiety is another matter .

The so-called distraction techniques encompass a set of tools and techniques aimed at reducing the child's anxiety by diverting his attention to other pleasurable stimuli. Giving something entertaining and pleasing to the child has been studied by Patel, Lee and Golden in 2006, among many others, with disparate results according to the chosen tool.

We found literature on video vision as a simple distraction technique in Mifflin's studies in 2012 that did find differences in the level of childhood anxiety that support the use of this technique prior to anesthetic induction. What if they are not videos but games Interactive In this case, Campbell, with 168 children, found that the preparation with interactive computer packages (in addition to the presence of the parents) was more effective than the purely verbal preparation to achieve a better cooperation of the child in the anesthetic induction, without finding differences when the programs were performed in both realistic and drawings simulations.

Patel also advocates the use of toys or distraction tools using video games. With them he found a better behavior of child anxiety when he used those video games than the one offered with the use of midazolam.

For this reason there are waiting rooms and rooms decorated in a creative and child-friendly way, with spaces that recreate playful environments or simply filled with various toys, thus creating a more de-structured gameplay (as psychologists would call these spaces) Because they let

the children self-administer the stimuli. Lee, among many others, is one of the authors who recommends this type of spaces after drawing conclusions from his studies. We personally appreciate a problem with the indiscriminate use of toys; I believe that it is hardly possible for a hospital environment to systematically sterilize deposited toys or to consciously introduce a vector of disease transmission, such as a toy used by these small patients (something that every pediatric anesthetist knows when suffering an unexplained and poor health in the first months of activity as a child anesthesiologist).

Without the parents, please

The presence of parents in anesthetic inductions is a tool of distraction applauded by many. Its use is explained by the generalized feeling that the presence of the parents reassures the patient, although the current evidence shows us that this is not so. There are contradictory studies in this sense but there is evidence after the analysis of different studies on this question that lead to the assertion that the presence of parents in anesthetic induction does not seem to reduce the anxiety of the children significantly.

Mayande A, in a Cochrane review of 2015, after analyzing 5 studies involving 557 children concluded that the presence of parents is less effective than pharmacological premedication with a standardized mean difference of only 0.03, CI 95% from -0.14 to 0.2. Kain's studies in 2009 also found no difference in anxiety levels in children when they came accompanied with induction of anesthesia with a parent versus the two parents, but did find differences in paternal anxiety itself when the two parents entered to the entrance in the operating room of only one. The collaboration of the child in the inhalation induction by facial mask has also been studied by several authors, concluding that the presence of the father is no more effective than the administration of benzodiazepines for this purpose (Kain 1998).

It seems that only parents with a low anxiety component are adequate to exert a beneficial effect with their presence in anesthetic induction, being precisely this group of parents who have children with a lower anxiety component in the operating room.

To top it off, Kain asked parents and anesthesiologists about the outcome of the parents' presence and the result was that 68% of the parents believed they had made the work easier for anesthesiologists while most anesthesiologists felt that the effect on his work had been null or negative. Are you surprised?

¿Does the silence upset you?

One of the interventions proposed to treat anxiety seems to be the logical suppression of noises and staff around the patient when he is going to be induced. Children exposed to low sensory stimulation prior to induction were significantly less anxious than control children in face mask placement in a trial of 70 children according to Kain's studies in 2001. It seems logical and so suggests this study although it is pointed out that, although children were more cooperative at the time of induction when the level of sensory stimulation of the operating room was taken care of, instead, the level of postoperative anxiety of the patients and that of the parents themselves did not appear to suffer variations in both groups.

Music does not cater to beasts

Music therapy did not show a significant effect on children's anxiety in a trial of 51 children, with Kain in 2004 who set out to demonstrate the effect of music in this regard. Again it was the presence of midazolam who put the true differences in levels of anxiety in anesthetic induction and as a curious fact they found that in the group of patients undergoing music therapy the musician was the key piece and not the tool studied that truly determined the effectiveness of the technique.

Previous exposure of the anesthetic mask

All of us who dedicate ourselves to pediatric anesthesia know how difficult it is sometimes to place the face mask to perform an inhalation induction. It seems logical to think that previously showing the mask to the child will cause a conditioning by increasing the predictability of experiences. However, previous exposure to the anesthetic mask did not find significant STAI score differences between a mask exposure group and the control group in a single trial of 103 children (RR 0.59, 95% CI: 0,31 to 1.11). Mac Laren concludes in a 2008 study that: although co-operation at the time of induction in the group who were previously exposed to the mask was superior (RR 1.27, 95% CI 1.06 to 1.51) the post-surgical anxiety, on the other hand, did not suffer variations, suggesting that previous exposure of the mask may facilitate anesthetic induction but not decrease anxiety levels, which seems paradoxical in itself.

¿Do clowns work?

Studies with clowns are also contradictory. Its use has been studied by many authors (Fernandes 2010, Golan 2009, Meisel 2009, Vagnoli 2005, Vagnoli 2010 ...) We find as some suggest that its use significantly reduces anxiety while others like Golan and Meisel disprove it categorically. A problem to catalog their effectiveness is the difficulty of finding the specific action that the clowns develop in the studies, becoming a variable of confusion to unify and to find scientific evidence to its use.

What seems clear is that its effectiveness does not exceed the classic midazolam as premedication although it seems to overcome the effectiveness of the presence of the parents in the induction. This leaves in a poor position the presence of the parents in the induction. It also does not help the inclusion of the clowns in a hospital program the poor reception they have among the operating room staff. Surveys conducted in different studies reveal that these have a negative effect on the normal development of medical

activity, with only the approval of a poor 28% by medical personnel.

Some psychologists explain these negative results by the load of disorder and chaos that implies the performance of the clowns. A distraction technique based on surprise and startle that does not seem to combine well in the stressful situations generated by the surgical activity.

Other interventions

The use of hypnosis to treat perioperative anxiety has also been investigated with good results. Hypnosis is defined as an altered state of consciousness characterized by focused attention. To do this and according to this study, 30 minutes before surgery, an anesthetist (with much free time) would enter the child's room and establish a "hypnotic relationship" using some of the child's personal belongings, talking about the fears of the boy and his favorite games. It appears that the hypnotic state was maintained until the induction of anesthesia, finding the authors an effect with hypnosis more effective than with midazolam for postoperative anxiety.

In this setting there are even studies with acupuncture. But since the current evidence suggests that this "millennial technique" is not more effective than placebo (Mai Xu meta-analysis, Madsen MV reviews ... etc.), we limit ourselves to commenting that there are supposed studies about it without going into value Its validity.

Conclusions

The main problem we face when trying to find evidence-based answers on this issue is the great heterogeneity that exists between the different studies. Being infrequent the appearance of a primary dichotomous variable (presence of anxiety or not) that is comparable between them to be able to compare them. Despite this, most studies use some scoring system but these are not sufficiently unified. The way to measure variables related to cooperation and anxiety also does not seem to be unified when we review the studies on the subject.

It can also be verified that most of the studies reviewed systematically exclude those patients who present some chronic or important pathology, these patients probably benefiting more from a program to reduce periquirurgical stress.

Moreover, the tools of observation or instruments used to assess anxiety have undergone variations during all this time with which the different studies use different versions of different anxiety scales that make comparative between them difficult (Nilsson 2012). Neither there are many specific assessment instruments for the different circumstances and the different types of subjects that can be studied in this environment, it is sometimes necessary to design and validate a de novo instrument to evaluate the circumstances that parents present in the surgical waiting room

But the great problem of this type of studies is its reproducibility or how to extrapolate to the population the conclusions obtained. This is a problem that has publicly exposed the international program called Reproducibility Project with the attempt to replicate 100 psychological studies and which calls into question the reproducibility, and therefore, the scientific validity of the main psychological studies, in a sample of honesty and respect for science itself. This problem is caused by the very large number of variables that influence the human psyche (attitude to surgical stress is not left out). Human behavior is complex and multifactorial. The responses that an individual presents to an experience of this type are influenced, not only by the type of person that is, but must take into account variables very difficult to control as they are; The type of family that receives the subject, the actual compression level of the disease, the time and type of illness. Not to mention the cultural, ethical, intercultural and even ethnic conditioning that influence the perception of the world around us. In short that each person is a world in itself and the prediction of their behavior is, today, very difficult.

¿So we implemented a program for the child patient?

The WHO defines health as the state of physical, mental and social well-being, and not only the absence of disease. For this reason, hospital staff, which is not composed of educators, are not child psychologists, nor of course, replacement parents for hours are required to know how to modify behaviors derived from surgical stress in situ.

Instead, it is their duty to find ways to conduct these dysfunctional behaviors, decrease the anxiety of the surgical process and improve the comfort of their patients in an efficient and effective way. To do this, it is necessary to offer tools that work, and it seems, that the preparation programs and some techniques of distraction work, all with their limitations and their particular benefits, so it seems appropriate to choose and individualize these tools in each hospital so that their organizational cost is adequate.

It is necessary to think in organizational terms when you want to implement a program that helps children cope with the surgical process. All center professionals should be aware of the fact that the correct preparation of the child involves good teamwork and that this represents a complex system of care. It is therefore crucial that all hospital staff involved have a voice and that they feel committed to its development and execution. It is crucial to listen to the opinions and comments of those professionals who would be affected by changes in work routines. The interpersonal differences that exist between the professionals involved in the surgical process, and in spite of that, to keep the child calm seem to represent in itself an important and significant mediator variable, however, it has rarely been investigated. To conclude, that the inclusion of this type of programs always implies a continuous evaluation of results and a constant program review, since it represents a way of humanizing health, but from the evidence and guaranteeing a correct attendance.

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