

Assessing the Effect of a Novel Distraction Technique on Behavior of Children Receiving Local Anesthetic Injection

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ABSTRACT

Background: To assess the effect of distraction technique that included adding decorative designs to syringe on the behavior of children receiving local anesthetic injection prior to dental treatment.

Materials and Methods: 50 children between the age group of 3 and 7 years, undergoing dental treatment under local anesthesia were selected for this study. Inclusion criteria- children with lack of any dental injection experience & exhibiting definitely positive or positive behavior rated by Frankl's behavior rating scale were selected for the study. Children were randomly assigned to an intervention group or to a control group. The intervention group of 25 children received injection with the designed syringe while the remaining 25 control group children were given the injection with conventional syringe by tell -show -do technique. Behavior was assessed using Frankl's behavior rating scale for local anesthesia.

Results: Distraction group - 88% of children showed positive and definitely positive reaction, 8% showed negative and 4% showed definitely negative reaction. Control group- 76% children showed positive and definitely positive reaction. 16% showed negative and 8% showed definitely negative reaction.

Conclusion: Adding decorative designs to syringe is advantageous in distracting children receiving local anesthesia injection and can be considered as an effective behavior management technique in such children.

Keywords: Distraction technique, behavior management, local anesthesia.

INTRODUCTION

One of the most delicate and difficult procedure in pediatric dentistry is administration of local anesthetic injection. The fear of needle and pricking, which is associated with the word "injection", makes children anxious.

The latest research from all fields indicate that needle-fear is predominant among children fears with some research claiming that up to 93% of children experience needle-related stress.¹ Many

studies have been performed investigating psychosocial methods of helping children to cope with their fear. Current research in this area has revealed several types of non-invasive treatments to aid children in their fear of needle. These can be categorized into distraction techniques and other methods. These techniques offer safer & cheaper alternatives to drug or anaesthetic treatments

Distraction treatment takes advantage of the brain's inability to pay full attention to two things at once. It works by passively or actively redirecting the

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child's attention away from the needle in the procedure at hand, leaving "less attention available to perceive pain."² Taking the child's attention from the needle also lessens his or her ability to feel anxiety; this is important because a large part of needle anxiety is the anticipatory stress caused by the needle. This phenomenon is referred to as an "analgesic effect," meaning "pain-relieving effect." Therefore this study was done to test the hypothesis – **If the look of the syringe was changed to sidetrack the child, would it help them forget the pain or trauma that generally comes with an injection?**

Aim:

To assess the effect of distraction technique on the behavior of children receiving local anesthetic injection prior to dental treatment.

To compare children's reactions to two behavior management techniques (Tell- show- do and distraction) during administration of local anesthetic injection.

MATERIALS AND METHODS

50 children aged between 3-7 years were selected from the OPD attending Department of Pedodontics & Preventive Dentistry, V.S. Dental College & Hospital, Bangalore and divided randomly in two groups. The lack of any dental injection experience was the inclusion criterion for participation in the study. Children exhibiting definitely positive or positive behavior rated by Frankl's behavior rating scale and who needed local anesthetic injection as part of their treatment plan were included in this study. Mentally handicapped children or such with poor hearing or eyesight, which could interfere with their understanding of explanations, were not included in the sample.

Table 1: The patients were selected & divided into two groups.

Total No. of patients	Group A of Intervention group	Group B Control group
50	25	25

For the intervention group, conventional 2 ml syringe were decorated using colorful and attractive stickers readily available commercially. Stickers were placed in such a way that the marking on the barrel is clearly seen.



Fig 1: Syringe decorated with stickers.

Decorated syringe were disinfected by immersing in 2% glutaraldehyde for 2 minutes, followed by rinsing thoroughly with sterile water. Local anesthetic injection was administered by decorated, toy like syringe after application of topical anesthesia. After insertion, the syringe was rotated to 180 degree such that the barrel becomes visible and markings are clearly seen.

In the control group, Local anesthetic injection was administered by conventional tell –show- do technique after application of topical anesthesia.

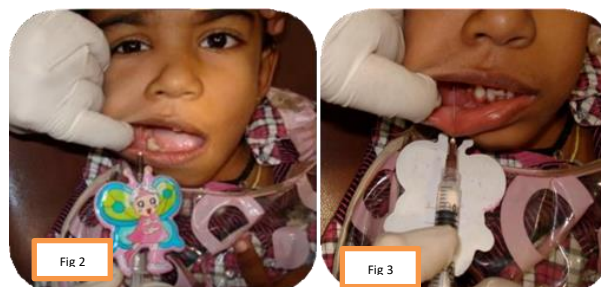


Fig 2: Local anesthetic injection with decorated syringe.

Fig 3: Syringe turned to 1800 so that the markings on the barrel can be seen.

The study was conducted by two examiners - Pedodontists. One of them gave all explanations, spoke with the children and carried out the anesthesia procedure; the other one was watching and assessing the child's reaction. It was rated with code from 1 to 4 on Frankl scale adapted for local anesthesia⁶ (Table 2.).

Table 2. Frankl scale adapted for local anesthesia
[Behavior Rating Description]

Definitely negative	1	Refusal of anesthesia administration, crying forcefully, fearful or any other evidence of extreme negativism
Negative	2	Reluctant to accept anesthesia administration, uncooperative, some evidence of negative attitude but not pronounced, i.e. sullen, withdrawn
Positive	3	Acceptance of anesthesia administration, at times cautious, willingness to comply with the dentist, at times with reservation but patient follows the dentist's directions cooperatively
Definitely positive	4	Good rapport with the dentist, interested in the dental procedures, laughing and enjoying the situation.

RESULTS

The study sample consisted of 50 children. There were 21 males and 29 females. The age range was between 3 to 7 years. Frankl Behavior rating scale for local anesthesia was adapted to assess the behavior. Rating Code 1 and 2 represented definitely negative and negative behavior while code 3 and 4 represented positive and definitely positive behavior. In the intervention group, 88% of children showed positive or definitely positive reaction compared to 76% children in control group while negative or definitely negative reaction was shown by 12% of children in intervention group as compared to 24% children in control group.(As shown in Table 3 & 4)

Table 3. Intervention Group

Rating code 1	4%
Rating code 2	8%
Rating code 3	80%
Rating code 4	8%

Table 4: Control Group

Rating code 1	8%
Rating code 2	16%
Rating code 3	72%
Rating code 4	4%

Data was analyzed using Man Whitney U test. Difference between both groups was statistically significant ($P= 0.0409$). The collected data shows that there is significant difference in the reaction of the children when we applied two different behavior management techniques during administration of local anesthetic injection.

DISCUSSION

Several types of behavior management techniques are used to decrease anxiety and fear in children during dental procedure. It ranges from simple technique like voice modulation to a more complex one like conscious sedation. The latter requires expertise, forethought, and considerable expense and may not be available in every community. Distraction as a behavior management technique is free or inexpensive, easy to perform, and an effective method of anxiety and fear control.

Distraction treatments can be divided into passive and active distraction. Passive distraction commands the child's attention but does not require any participation on the child's part. Active distraction requires the patient's participation. **2**

Fear of needles, or needle phobia, can impact the care a patient receives. Some children become hysterical at the sight of needles, while some will avoid visiting dentist altogether. Research suggests that poor pediatric anxiety and pain management results in short- and long-term repercussions for the child patient, parent, and staff. It can necessitate more personnel resources to restrain the child. **3,4**

In the present study, we have tried to use distraction therapy, by designing a brightly colored, attractive toy-like syringe, where syringe is barely visible. Such decorations likely interfere with an established link between visual recognition of a perceived threat and the subsequent emotional response to that threat.

Results from our study indicate that distraction technique resulted in a reduction of uncooperative behavior during dental procedures on young patients. Thus the use of decorated needles can increase the quality of care when patients are less stressed.

As per the literature available, there is no reported study in dentistry regarding the use of decorated

syringe for distraction. But in medical field, Kettwich et al conducted a study comparing decorated and plain syringes. The research hypothesis was that "adding decorative designs or stickers to medical devices before a procedure [would] significantly reduce aversion, fear, and anxiety...[in] needle-phobic patients." The results of their study showed that the stress-reducing medical devices are effective in reducing aversion, fear, and anxiety towards the medical needles.⁵

Several studies were conducted comparing the use of other forms of distractions while giving local anesthetic injection in dentistry. The results found that distraction was advantageous in managing children undergoing invasive dental procedure.^{7,8}

Aminabadi NA et al conducted a study to determine the efficacy of distraction and counterstimulation in the reduction of pain during the administration of local anesthetics in pediatric dental patients and concluded that both distraction and counterstimulation are effective in reducing pain reaction in a clinical setting.⁷

Peretz B et al conducted a study to assess the effect of an active distraction technique that included the repeated breathing and blowing out of air on the pain behavior and facial display of children receiving local anesthesia injections prior to dental treatment. The results of this study indicated some advantages of distraction techniques (deep breaths and blowing air) prior to and during the administration of a local anesthetic injection in children.⁸

Results from our study also reveals that Distraction, as a behavior management technique, is effective in reducing pain reaction in a clinical setting. Moreover, this technique is quick, economical & safe for the use in pediatric age group. The size of our sample does not allow to make a classificational statistical analysis, which will be the aim of our future research.

CONCLUSION

Adding decorative designs to syringe is advantageous in distracting children between age group of 3- 7 years, receiving local anesthesia

injection & can be considered as an effective behavior management technique in such children.

CONFLICTS OF INTEREST

The authors declare they have no potential conflict of interests regarding this article.

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