

CAMOUFLAGE TECHNIQUE: A NOVEL BEHAVIOUR MANAGEMENT STRATEGY FOR LOCAL ANESTHESIA

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ABSTRACT

Background: Irrespective of the various behaviour therapy methods implied to alleviate the pain response due to the fear provoking stimulus, the site of injection needle and pain provokes anxiety response mainly due to the previous classical conditioning due to earlier injections or immunization of childhood or a dental injection during previous years. **Aim:** To endeavour a new behaviour management technique to change the perception of child to local anesthetic technique by desensitising the child to the fearful stimulus. **Materials and Methods:** A randomised clinical trial was conducted among a study group of 65 children of frankel rating 2 and 3 are

selected and a **modified** syringe pattern camouflaged with the child's favourite cartoon character is introduced during local anesthesia administration thereby desensitising and guiding the child to think different or see a new point of view to the previously fearful situation. The control group is subjected to injection using a normal syringe with no modification. The pain perception levels are measured using a behavioural observational pain scale and compared between two groups. **Result:** Statistical analysis was done using Mann-whitney test and showed significant difference between the study and control group with p value of 0.001. **Conclusion:** The behaviour scale showed a better management of children wherein the modified syringe pattern was used rather than where the normal pattern was

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used. The use of this technique would help us to overcome the major hurdle of fear in children during LA administration.

KEYWORDS: randomised clinical trial, behaviour management, syringe, camouflage.

INTRODUCTION

Any dental procedure on a pediatric patient are often painful, unexpected and heightened by situational stress and anxiety, leading to an overall unpleasant experience.^[1] Ironically the most common form of pain control used in dentistry, the local anesthesia itself can produce anxiety.^[2] When the little toddler on the dental chair starts to whimper at the mere sight of even mention of the word injection its both the parent and the dentists never ending struggle to get the procedure substituted with a pain free procedure. This scenario of pain is most often a portraiture of the internal feelings associated with the fear of injections and needles since pain perception is known to have both psychological and physiological components.^[2]

The site of injection needle and pain response occur as a basically conditioned paired stimulus response in children either instilled by parents or peer groups, the individual personality and psychological development in children and previous experience in dental or medical set up. This can even lead to an excessive intense and persistent fear of needles or needle phobia that can cause significant avoidance, distress or impairment which affects mainly 1.6% individuals in general population.^[3] Irrespective of the various behaviour therapy methods such as guided imagery, distraction, play therapy, externalization,, coping, audiovisual analgesia usually implied to alleviate the anxiety the very site of injection needle itself is anxiety provoking for both children and adults.

The aim of our study was to camouflage the needle to eradicate the needle phobia and use this approach to change the perception of the child towards Local Anesthesia., which the child believes is much painful to him / her by adopting a new frame under disguise for the injection delivery appliance. We aimed to assess the effect of a modified behaviour management procedure applied as a novel technique on the level of pain perception in children receiving LA in a dental procedure.

METHODOLOGY

A randomised controlled trial was carried out among children of 5 to 9 years age group, both male and female reporting to the Department of Pedodontics KVG Dental College and

Hospital, Sullia. The sample size was 80, 40 each in the study and control group was obtained using a simple randomised sampling. The children with fear of injection was selected using child fear survey schedule- dental subscale (CFSS-DS) (Table -1) developed by Cuttbert and Melamed in 1982. The CFSS-DS consists of 15 items covering different aspects of the dental situation.^[4] All children who scored 3 to 5 on a Likert 5 point scale for question NO 3 on injection with fear of injection were included in the study group and control group. Mentally handicapped children and children with poor hearing or eyesight which could interfere with the understanding of the procedure and explanations were not included in the sample. Children emotionally matured (age group above 10 years) enough who cannot be psychologically tranquilised with a deceptive mask and behaviourly cooperative children who seemingly dint require a special effort to keep them subdued were also exempted from the study. Emotionally immature children in whom the thought dimensions were not mature enough to accommodate such ideas and those with other medical and systemic compromising conditions were excluded. The children who fulfilled the inclusion criteria were then randomly assigned to an intervention group or to a control group in the order in which they reported to the clinic.

The RCT study was done after ethical clearance of the institution and consent from all concerned parents were obtained. Our novel technique involved a custom made modification of the local anesthesia syringe which was covered on all sides with a sterile plastic shield embossed with very popular comic characters, to encapture the child's focus of attention to a field of vivid imagery. Different attractive stickers were used depending on the child's likings to camouflage the syringe (Figure 1). We used the word camouflage because the site of the injection is rated as a most fear provoking stimulus, thus concealing the syringe can avoid the reaction and sensitization to the syringe thereby avoiding the reinforcement of pain stimulus by classical conditioning.

Here the traditional fear provoking syringe, the standard local anesthesia was converted into a pedo friendly non-threatening gimmick, the magic rocket carrying sleepy water that would put their tooth to sleep with a small ant bite. The barrel of the gadget was well concealed so as not to give the anxious toddler any idea of the matter under the roof. The needle portion was not covered for ease of administration of the medication and the needle cap was left unremoved while introducing the gadget to the child. The piston also was left uncased for the

purpose of delivering the anesthetic dose. A B.D ultra-fine insulin syringe was used so the penetration was less painful and was easy to camouflage as the size would be less bulkier.

Prior to the appointment data gathering was done about their favourite cartoon characters by pre appointment telephoning and preappointment mailing depending on which a rapport was built with patient. Topical anesthetic gel was applied on a cotton roll to the injection site one minute prior in both the groups and they were made to relax and advised to take deep breaths to a count of 10. The 40 children in the intervention group was then subjected to LA with the novel camouflaged syringe which had the cartoon characters of his choice enveloped around the whole length of the barrel of the syringe after a short reframing.

Various designs were made with different cartoon characters and the child was convinced that it was his favourite character that is going to place a medicine on his teeth and will never hurt him. The rapport with the child was created by verbalising with the child and he himself was given a chance to choose the character of his own preference from the various choices presented to him (Figure 2).

Communication was used to explain about the syringe using tell show do and was explained as a special type of a toy which carried sleepy water to put the tooth to sleep along with a short story on the cartoon relating to the oral condition, thus reframing the old fearful one into a new painfree procedure. The whole painful idea of injection with a sharp needle will be transferred to a welcoming idea of someone familiar with the child can make him feel more relaxed. We held the syringe by the head portion of the syringe so that the needle is not visible and the child was allowed to appreciate the barrel portion which was camouflaged. (Figure 3)

Once the procedure was about to start the cap is removed and the anesthetic solution was then administered using the 30 gauge, 12.7mm, 1ml bd syringe for infiltration. Aspiration is done prior to administration and for proper visibility in case of a positive aspiration a 1mm length of the barrel is left uncovered with the envelope (figure 4)

During the injection the behavioural observational pain scale was used for objective evaluation of the children (table 2). We chose three items with a correlation to pain

1. facial expression
2. Vocalisation

3. Body position

Each of these variable was allocated in three grades 0, 1, 2 to keep the scale as simple as possible. The sum of these variable in BOPS will be between 0 and 6 points (table 3).^[5]

RESULTS

21 girls & 19 boys of mean age group of 4 to 9 years was included in the intervention group. 24 girls and 16 boys participated in the control group.

Table 4 and 5 represents the BOPS scores for control and study groups respectively. The comparison of the BOPS scores of the 2 groups using mann whiteny t test showed statistically significant results with p value of 0.001. 75 % of children between the ages of 4-5 years in the intervention group were scored a score of 3 or less on the BOPS, with maximum number of children scoring a BOPS value of 2 (27.00%). Scores 1 to 2 indicate no pain during the treatment and the study group well fits in this category. 72.50% of children in the control group scored BOPS values of 4 or above and the maximum children scored for BOPS value of 6 in the control group (32.50%). Score of 5- 6 in the BOPS scale indicates severe pain during the treatment and children presents with a negative facial expression and distorted face. They mostly present with crying, screaming and the body position will be rigid and drawn up with arms and legs to the body in this category of children.

This difference between the groups was found to be statistically significant. Only 15% of the children scored the maximum value of 6 which scored for maximum pain in the study group when compared with the control group where 32.50% children scored for the maximum score of 6, thus giving a statistically significant result in the intervention group. While 20.00% scored for the minimum pain score of 0 in the intervention group only 2.50% scored for the minimum score of 0 in the control group which again showcased that the lower pain scores were obtained in the intervention group than the control group.

TABLE 1: CHILD FEAR SURVEY SCHEDULE- DENTAL SUBSCALE (CFSS-DS).

Name _____	O.P NUMBER:-
Age _____ Sex _____	Child was :
Address _____	Cooperative yes no
Anxious about question yes no	
Answered question yes no	
Understood questions yes no	
Not afraid A little A fair Pretty much Very	
At all afraid amount afraid afraid	
Items 1 2 3 4 5	
1. Dentists _____	
2. Doctors _____	
3. Injections (shots) _____	
4. Having somebody examine your mouth _____	
5. Having to open your mouth _____	
6. Having a stranger touch you _____	
7. Having somebody look at you _____	
8. The dentist drilling _____	
9. The sight of the dentist drill ling _____	
10. The noise of the dentist drill ling _____	
11. Having somebody put instruments in your month _____	
12. Choking _____	
13. Having to go to the hospital _____	
14. People in white uniforms _____	
15. Having the nurse clean your teeth _____	

TABLE 2: THE BEHAVIOURAL OBSERVATIONAL PAIN SCALE.

SCORE	FACIAL EXPRESSION	VERBALIZATION	BODY POSITION
0	Neutral/positive facial expression, composed, calm	Normal conversation, laugh	Inactive, laying relaxed with all extremities or sitting, walking
1	Negative facial expression	Completely quiet or sobbing and complaining but not because of pain	Restless movements, shifting fashion and touching the wounded area
2	Negative facial expression, grimace, distorted face	Crying, screaming and complaints of pain	Lying rigid and drawn up with arms and legs to the body

TABLE 3: SCORING FOR BEHAVIOURAL OPERATIONAL PAIN SCALE

BOPS SCORE	PAIN LIMIT
1 - 2 POINTS	NO PAIN
3-4 POINTS	MODERATE PAIN
5-6 POINTS	SEVERE PAIN

TABLE 4: TOTAL NUMBER AND PERCENTAGE OF CHILDREN FOR EACH SCORING IN THE CONTROL GROUP.

CONTROL GROUP			
Scoring values in the scale	Total number of children	Total number in the control group	percentage
0	1	40	2.50
1	0	40	0.00
2	5	40	12.50
3	5	40	12.50
4	6	40	15.00
5	10	40	25.00
6	13	40	32.50

TABLE 5: TOTAL NUMBER AND PERCENTAGE OF CHILDREN FOR EACH SCORING IN THE STUDY GROUP.

STUDY GROUP			
Scoring values in the scale	Total number of children	Total number in the study group	percentage
0	8	40	20.00
1	2	40	05.00
2	11	40	27.50
3	9	40	22.50
4	2	40	05.00
5	3	40	07.50
6	5	40	15.00



Figure 1



Figure 2

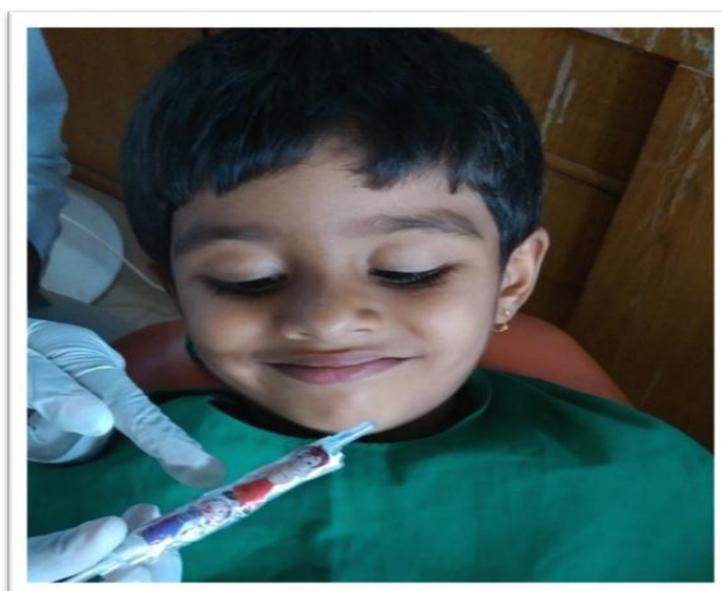


Figure 3



Figure 4

DISCUSSION

Irrespective of the various behaviour therapy methods the very site of the injection needle itself is very anxiety provoking for both children and adults. Fear of injections is believed to begin early in life. Anticipatory fears of sharp objects can be seen around 1 year of age.^[6] As long as injections are an inevitable part of pain management there is always a quest to find a novel behaviour management technique to change the perception of a child to local anesthesia technique. Children of a particular age group of 5-9 yrs was selected via a randomised clinical trial. This age group was selected because it shows the maximum disruptive behaviour.^[2] Milgeon, Manel, King and Weinstein found fear of injections to rank second (after a stranger touching you) in fear of 5- 11 year olds. Peretz and Efrat found feeling and seeing the needle to rank highest in the reported dental fear in this age group of children.^[7] 5 -9 yrs was selected because it encompasses the maximum number of children with pulpal involvement and local anesthesia in the 1st visit can be a challenge as it is in counter to the routine protocol of desensitization where local anesthesia should be the last procedure. In this category of children, injection with local anesthesia can be associated with pairing of stimulus of pain and injection increased risk of reinforcement of classical

conditioning. Associated medical conditions or cognitive deficiency may also put the children at the risk of experiencing difficulty in coping up with the dental situations.^[8]

Several behaviour management techniques have been advocated to overcome the needle phobia through desensitization. Trials using tell show do approach by Glassman recommended showing the needle in the final steps of a desensitization process.^[9] Duff recommends showing the needle to the child prior to the anesthesia because if not shown the child may imagine a needle that is much larger and produce more pain than they actually are and thus proceeding to a degree of even phobia to the site of a needle.^[9] In this study we used an innovative technique for managing the needle phobia by using a camouflage method along with a tell show do procedure, thus preventing the imaginary fears from resurfacing. The camouflaged syringe was selected on the patient's choice of his favourite cartoon character and was told that it carried sleepy water to the tooth thus preventing or dissociating the dental needle from the vague impression the child may have had of a threatening instrument, when hiding the needle. We followed the principles described by Spedding and Mink where we told the child that we would put his tooth to sleep, but he would stay awake and that it might feel like a pinch or an ant bite^[9] similar to the reframing technique which uses euphemistic or less traumatic language to describe a particular technique or situation to the child.^[10] The syringe did not enter the child's field of vision at any point, before during or after the LA administration.

In this study we used a variant of distraction method as various studies have proved that techniques such as distraction is better than modalities such as adult reassurances. Results shows that adult reassurances is associated with increased child distress whereas distraction is associated with increased child coping. Its proven that reassurance showed a counter intuitive relationship with the child leading to more of distress and crying. Higher rate of fear was observed with methods such as reassurance rather than distraction.^[11] On the other hand previous studies were conducted such as the one wherein distraction techniques such as writing in the air with the leg (WITAIL) and distracting the child using audiovisual aids during LA administration has given statistically significant results and showed that such techniques proved to be better choice in reducing the fear and anxiety. In the WITAIL technique the child's attention was diverted to an area that is very close to the area being treated in the oral cavity, and could be reverted back to the primary area easily. Also the child here played only a passive role.^[2] Audio distraction by means of music has also been

attempted previously but was not found to be of statistical significance. In audio visual distraction technique, the observation of a filmed model who depicted positive behavior during dental treatment and was, in turn, verbally and materially reinforced for cooperation in the modeling film reduced the fear quotient. Exposure to the modeling film may have familiarized the children to the sights, sounds, and procedures that they will be subjected to. Audiovisual distraction technique using television was found to be more effective than audio analgesia but would necessitate extra equipment.^[12] Distraction induced by audiovisual (A/V) glasses was also found to significantly reduce pain associated with injection of local anesthesia.^[13] Distraction techniques such as deep breathing and blowing out of air also has proven beneficial in previous studies.^[10]

Without previous experiences the imagination about the needle may have been worse than the needle itself. In such situations camouflaging the needle helps to overcome or challenge the anticipation bias, which is the patient's unrealistic view of what is going on to happen. Another part is resolving the cognitive dissonance, defined as the discrepancy between reality and the patient's consolidation of their beliefs and behaviour.

The CFSS DS questionnaire had already been proved to be quite reliable in assessing a child's dental anxiety (artman et al 1998) .It helps in instant assessment of dental fear in children.^[4] Thus it helps in instant classification of the children reporting for treatment rather than behavioural scales such as frankel rating scale which lacked sensitivity due to limitations based on the observers attitude. The behavioural operational pain scale is found to be a valid and reliable one in the usage of pain assessment in children of 1 to 7 years of age in post-operative pain assessment after LA administration.^[5]

The study had few limitations as the area of interest of the child, the camouflaged area, is on the syringe itself is very near to the operating area can lead to attracting the child's attention any moment without a careful intervening by the dentist. The syringe used here is a 1 ml BD syringe which limits itself to its usage for anterior teeth infiltration anesthesia as in the case of treatments for ECC rather than for nerve blocks. Extra attention needs to be given during the time of aspiration to be careful enough for proper visualization in case of a positive aspiration.

CONCLUSION

In the never ending search to make child dentistry painless and fearless the novel camouflage technique can help the child fight a fear of injection, so the child leaves the operatory without fear and anxiety and this can be a good foundation for good future dental appointments.

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