

## REACTION OF 5 AND 6 YEAR OLD CHILDREN TO LOCAL ANESTHESIA DURING DENTAL TREATMENT

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### SUMMARY:

One of the most delicate and difficult procedure in pediatric dental treatment is the administration of local injection anesthesia. There are literary data showing that dental anxiety in children might be due to maternal anxiety, family influences, personality and psychological development of the children, and previous painful medical and dental experience.

The aim of this study was to compare children's reaction to two techniques of local anesthesia administration - the one in which the dentist shows the needle prior to local anesthetic administration to the child and the other in which the dentist does not show the needle. It aims also at investigating if there is a connection between mother's and child's attitude to dental treatment and reaction of the child during anesthetic administration.

24 children aged 5 - 6 (12 girls and 12 boys) took place in this study. All participants needed local injection anesthesia as part of their treatment plan.

The collected data give us the reason to accept that there is no difference in the reaction of the children when we applied both different techniques for anesthesia (with or without showing the needle), because the results are identical. The study shows that local injection anesthesia can be successfully applied even at 5 and 6 years old children.

**Key words:** local anesthesia, dental treatment, children, fear

### INTRODUCTION:

Incidence of fear of dentistry ranges between 3% and 20% in children (3, 8, 13, 16); older ones tend to be less fearful (10). The "tell-show-do" technique was introduced by Addeleston (2). The aim of this technique is to guide the behavior and reduce the normal fear of children - dental patients during different stages of their psychological development.

Pediatric dentistry textbooks (1, 9, 17, 12, 14) recommend showing instruments before using them in the clinical procedure. It is necessary always to explain in brief the functions of these instruments and to prepare the child

of what hi/she would feel before using them.

One of the most delicate and difficult procedure in pediatric dental treatment is the administration of local injection anesthesia. Modern pediatric dental treatment encourages painless procedures. The fear of the needle and the pricking, which is associated with the word "injection", makes children anxious. Glassman (7) recommended showing the needle in the final steps of a desensitization process. Duff (5) recommends showing the needle to the child prior to anesthesia, because if not shown, the child may imagine a needle that is much larger and procedure more painful than they actually are.

There are literary data showing that dental anxiety in children might be due to maternal anxiety, family influences, personality and psychological development of the children, and previous painful medical and dental experience (10, 6, 4).

**Aim:** The aim of this study was to compare children's reaction to two techniques of local anesthesia administration - the one in which the dentist shows the needle prior to local anesthetic administration to the child and the other in which the dentist does not show the needle. It aims also at investigating if there is a connection between mother's and child's attitude to dental treatment and reaction of the child during anesthetic administration.

### Tasks:

1. To compare the reactions of children separated in two groups, who received anesthesia through different clinical technique.
2. To find out if there is a connection between child's reaction and mother's attitude toward local anesthesia.
3. To make some recommendations for clinical practice

### MATERIAL AND METHODS:

24 children aged 5 - 6 (12 girls and 12 boys), patients from the clinical practice of the two examiners, were selected and divided randomly in two groups. The lack of any dental injection experience was the inclusion criterion for participation in the study. All participants needed local injection anesthesia as part of their treatment plan. Mentally handicapped children or such with poor hearing or eyesight, which could interfere with their understanding of procedure

explanations, were not included in the sample.

The aim of the study was explained to each mother and informed consent for local anesthesia administration was obtained. Mothers completed a questionnaire. The aim

was to assess their attitude toward dental treatment and the attitude of their children (dental fear, child's personality, etc.) (Table 1.).

**Table 1.** The questionnaire completed by participants' mothers

Questions	Answers
1. Are you afraid of going to the dentist for dental treatment (including anesthetic administration)?	Not afraid at all Very afraid A little afraid
2. Are there other family members who are afraid of dental treatment?	No Yes, Who?.....
3. Have you ever used a dental visit as a threat of punishment for your child?	No Yes
4. Do you think your child has discipline problems?	No Yes
5. What is your child's response to a new situation?	Approach Withdrawal
6. What is your child's previous experience with injections?	Crying, refusing to cooperate Worried Calm Positive
7. Has your child ever been to the dentist before? If yes, how would you rate his/her previous dental experience?	No Yes Crying, refusing to cooperate Worried Cooperates reservedly Positive
8. Has your child ever been exceptionally afraid of a specific dental procedure?	No Yes, Which?.....

We divided the children of our sample in two groups of 12 children (6 girls and 6 boys) in order of arrival to the dental office. Each child was treated in two different sessions. In the first visit we made a complete oral health status assessment of each child and discussed the necessity of local anesthesia administration as part of his/her treatment plan. Using the "tell-show-do" technique we explained in the same way to each mother and her child the aim of the anesthesia, the procedure and needed instruments, but with one group (group A), we showed the needle in the first session before anesthetic administration and with the other (group B), we did not show the needle. When showing the needle, we asked the child to help by holding the syringe, and then the dentist assembled the syringe, anesthetic

cartridge and needle while the child watched (Fig. 1.). When hiding the needle, we followed the principles described by Spedding and Mink (15). We told the child that his tooth would fall asleep, but he would stay awake and that it might feel like a slight prick. During one of the next visits second local anesthesia was administered, in which we showed the needle to the children from Group B, and we didn't show it to the children from Group A.

The study was conducted by two examiners - dentists. 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 anesthesia (11) (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

We performed the statistical analysis using Log linear and chi-square tests.



**Fig. 1.** Child watching the assembled syringe (D.D. 6 year old)

### RESULTS:

The collected data (48 assessed reactions during local anesthesia) give us the reason to accept that there is no difference in the reaction of the children when we applied both different techniques for anesthesia (with or without showing the needle), because the results are identical. Similar difference was not found also referring to the sequence of applying both approaches (first or following visit).

From all 24 children, who were examined, 19 were assessed as positive (codes 3 and 4, respectively Fig. 2. and Fig. 3.) during local anesthesia administration, and 5 children – as negative (codes 1 and 2, respectively Fig. 4. and Fig. 5.) during the two visits. These results are shown graphically on Fig. 6. In Group A the reaction of 9 children (75 %) was assessed as code 3 (positive) and the same number of children got code 3 also in Group B (Fig. 7. and Fig. 8.). We successfully applied the anesthesia to 22 of the children (91, 7 %), whose reactions we assessed as code 2, 3 or 4, and we failed with only 2 of them (8, 3 %), assessed as code 1 (Fig. 9.).

We defined, through Log linear analysis and chi-square test, that there is not statistically significant connection between child's reaction and mother's attitude toward dental local anesthesia. However, there is such connection between both gender of children and the answers

to Question No.1 "Are you afraid of going to the dentist for dental treatment (including anesthetic administration)". The mothers of the boys were less afraid of the dental treatment than the mothers of the girls ( $p=0.048$ ). There is also a statistically significant connection between the reaction of the children and Question No.6 "What is your child's previous experience with injections" ( $p=0.007$ ). The results show that children who were calm when they had previous injection, react positively also to the local anesthesia during dental treatment. Unlike them, children who are worried or refuse having an injection, react negatively also to the local anesthesia injection. The analysis shows that connections between the answers of all the other questions and children's reactions are statistically insignificant.

The size of our sample does not allow to make a classificational statistical analysis, which will be the aim of our future research.

All mothers answered negatively to Question No. 3 "Have you ever used a dental visit as a threat of punishment for your child", therefore we excluded the question from the analysis. It does not contribute to the study of the statistical connections and is considered as a constant.



**Fig. 2.** Reaction-code 3 (M.M. 6 year old)



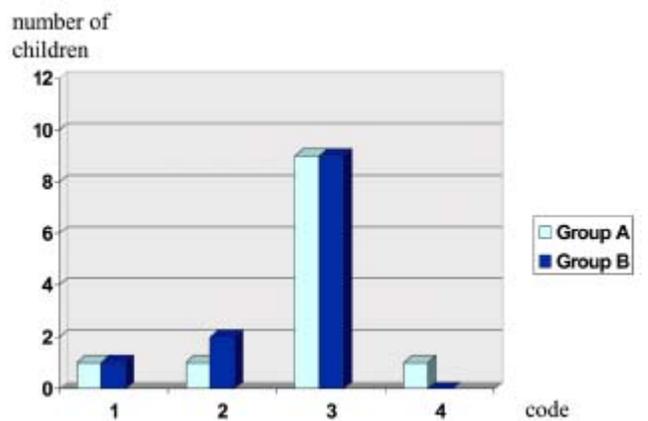
**Fig. 3.** Reaction-code 4 (I.A. 6 year old)



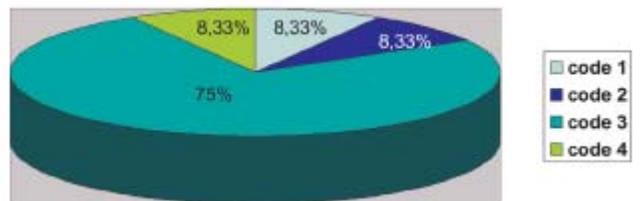
**Fig. 4.** Reaction - code 1 (G.V. 5 year old)



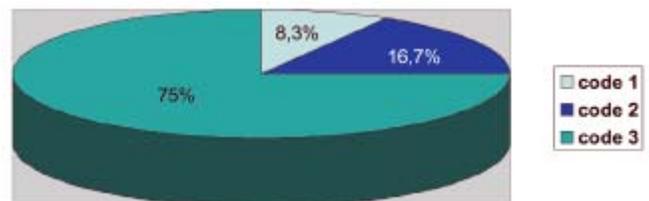
**Fig. 5.** Reaction - code 2 (P.M. 5 year old)



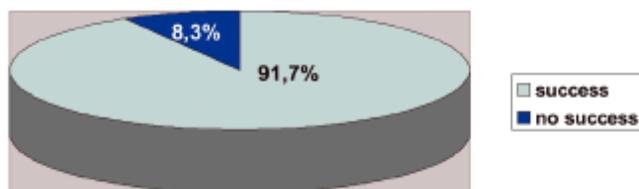
**Fig. 6.** Reaction assessment of each child during local anesthesia applied through two approaches and illustrated with codes



**Fig. 7.** Reaction assessment of Group A illustrated with codes



**Fig. 8.** Reaction assessment of Group B illustrated with codes



**Fig. 9.** Correlation between successful and unsuccessful local anesthesia administration

### CONCLUSION:

- There are differences in 5 and 6 year olds' behavior and reactions during local anesthesia administration. About 79, 2 % from the children show positive and definitely positive reaction for both groups. 12, 5 % show negative

reactions and only 8, 3 % are definitely negative.

- The study shows that the two techniques (showing and hiding the needle) do not influence the reactions of children during local anesthesia administration. We didn't find out a connection between mother's attitude and fear of local anesthesia and the reaction of her child.

- We found out that child's previous experience with injections plays an important role on their reactions. The results show that children who were calm when they had previous injection, react positively also to the local anesthesia during dental treatment.

- The study shows that local injection anesthesia can be successfully applied even at 5 and 6 years old children, which should stimulate the pediatric dentists to conduct painless dental treatment in the early childhood.

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