The use of the local analgesia syringe in children. Should it be kept out of sight? A clinical trial of two methods of presentation

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**Abstract**

**Aim** The study was carried out to determine whether showing a local analgesia (LA) syringe to a child would influence behaviour during subsequent administration of LA, as opposed to concealing it.

**Materials and methods** 25 children were randomly assigned to either a show (13) or no-show (12) group. The children were aged 4 years and 3 months to 8 years and 9 months, mean age 7 years and 9 months. One operator carried out all LA administrations. The procedure and dialogue were strictly standardised. Each child was filmed during LA administration. Three paediatric dentists scored the video recorded behaviours, using the Frankl Behaviour Rating Scale. The raters were blind as to which group the child belonged to.

**Results** No statistical difference was found between the behaviour ratings of the no-show and the show groups during LA administration (p>0.05).

**Conclusion** Overall, the behaviour of the children in the show group did not differ from the behaviour of children in the no-show group. Whether to show or not to show the LA syringe is probably dependent on the behavioural skills of the operator.

**Keywords**: Local analgesia, Children, Behaviour

**Introduction**

One of the most potentially stressful events in dentistry is the administration of dental local analgesia (LA). Effective behaviour management is fundamental to the successful delivery of dental treatment to children. In addition, many dental procedures are invasive and adequate analgesia is an essential prerequisite. Amongst the many different approaches to pain control which have been tried, injection of a local analgesic solution remains the most reliable and widely used technique. Unfortunately, some children, and adults, find LA difficult to accept. Most previous studies of LA acceptability have compared LA agents or equipment, but there has been little work on the effect of dentists’ behaviour during LA delivery and on how this might affect acceptance.

One such variable is showing or concealing the LA syringe. Traditionally, keeping the syringe out of a child’s field of vision has been recommended [McBride, 1945; Andlaw and Rock, 1987]. However, more recently, Duggal et al. [1995] recommended showing the child the assembled LA syringe with the needle guard in place. In both instances the recommendations are based on the personal experience of the authors and though empirically based. Duggal et al. [1995] argue that deliberate concealment of the syringe is contradictory to ‘tell, show, do’ [Addlestone, 1959] and could potentially constitute a ‘breach of trust’ between child and dentist. Andlaw and Rock [1997] acknowledge that concealment contravenes ‘tell, show, do’, but state that ‘the needle should not be shown, because most children (and adults) are apprehensive about needles’.

In spite of an exhaustive search of the literature, to date no evidence appears to have been published which supports either hypothesis. Accordingly, a pilot study was initiated to investigate which of the two behavioural approaches for LA administration would be better for children.
**Materials and methods**

The objective of this pilot study was to investigate any differences in behaviour of child patients when receiving LA by two different techniques. Prior to the commencement of the study, ethical approval was obtained from the Research Ethics Committee, Leeds Health Authority, United Leeds Teaching Hospitals.

The study population consisted of 25 children aged between 3 and 8 years selected from those referred to the children’s department of the Leeds Dental Institute for possible treatment. As children attended, each parent/child that met the selection criteria (see below) was invited to take part in the study. All children had no previous experience of LA for dental treatment. No attempt was made to pre-select children on the basis of race or sex. The children were casual patients or new referrals sent to the department by general dental practitioners as needing restorative treatment.

Each parent and child was given a relevant information sheet explaining the aims and nature of the study. This was supplemented by verbal clarification if required. Consent was sought both verbally and in written form from the parents. When children were over the age of six years, assent was obtained. Of those children and parents approached none refused to participate.

Children, who had assented and whose parents consented to take part in the study, were allocated to either a show or no-show group using Fisher’s table of random allocation [Fisher, 1965]. The groups were not matched in any way. Each child received LA on one occasion only. This was always an infiltration administered for the restoration of a tooth in a maxillary quadrant. A parent was present at all times in the surgery during the procedure. This was due to the fact that all parents wished to be present for some, or all, of a child’s treatment as determined in a previous behaviour study [Fenlon et al., 1991].

Having allocated the child as to the show or no-show group, 20% benzocaine topical anaesthetic was applied to the injection site. 1.8 mls of Prilocaine LA (Citanest, Astra Pharmaceuticals, London), warmed to body temperature, was administered. A gauge 30 needle was used for every LA administration. In each case the operator’s dialogue was strictly standardised and followed a carefully prepared and rehearsed script. This was so that exactly the same words were used for all children in the study. The same operator (MB) carried out the LA administration in all cases.

The Venham Anxiety Scale picture test [Venham and Gaulin-Kremer, 1979] was used to assess the anxiety level of the children in both groups just before and immediately after LA administration. Having placed topical gel (Sultan®, mint flavour, Sultan Prods., Jersey City, USA) over the site of the proposed infiltration, the Venham Picture test was presented using the following dialogue:

‘Look at these pictures. Please tell me which one looks most like how you feel now’.

**No-show group.** Having completed the picture test, the dental chair was reclined and the child told:

‘We are going to put your tooth to sleep now’.

The topical benzocaine ointment was applied using the dialogue:

‘We are going to put some magic ointment on you gum to help put your tooth to sleep’.

The LA syringe was then passed below the child’s line of vision from dental nurse to the operator, the needle unsheathed and the LA administered.

**Show group.** Having completed the picture test, the dental syringe was introduced using the same dialogue for application of the benzocaine cream. The following dialogue was used:

‘This is the magic juice that puts your tooth to sleep. The magic juice is inside this tube. Can you see it? We put this beside your tooth under your gum and then your tooth will begin to go to sleep’.

If the child asked ‘Is it going to hurt?’ the reply was ‘It will press a little, but it won’t be too difficult’. The assembled syringe, with plastic sheath protecting the needle still in place, was shown to the child. It was then passed back to the dental nurse and the dental chair was reclined. Outside the child’s line of vision the needle was unsheathed. The LA injection was then administered in exactly the same fashion as the no-show group. Immediately following each LA procedure, each child was asked to give another assessment on the Venham picture test as described previously.

A single video camera was used to film all parts of the LA administration procedure. This camera was wall mounted in the surgery and positioned so as to film the operator and the child. A microphone attached to the dental light allowed sounds to be recorded onto a videotape. VHS videotapes were used to record each episode of LA administration. To identify each child on the videotape, an assistant held a card with the patient’s name, filmed by the camera, at the beginning of recording. The video filming of the procedure began only immediately prior to insertion of the LA syringe. This ensured that the raters were unaware of which group the
child belonged to and did not see any of the show or no-show techniques.

Three paediatric dentists, who had not been involved in any way with the study during filming, rated the child’s behaviour during LA administration by viewing the 25 video clips. The raters assessed the behaviour of each child during LA administration using the Frankl Behaviour Rating Scale (Frankl et al., 1962). To determine the reproducibility of the raters assessments some 16 visits were rescored after an interval of several weeks.

Non-parametric statistical analysis was used with the Mann-Whitney U test and Spearman’s Rank Correlation. Inter-rater and intra-rater reliability tests were also undertaken. A p>0.05 value was considered to be significant.

**Results**

Three raters viewed the videotape recordings of the 25 visits. The results of the raters reliability, both inter- and intra-rater, are shown in Table 1. The results using Kappa scores were very good.

The no-show group had 13 subjects, mean age 7 years and 4 months (SD=17.2 months, range 57-106 months) and the show group 12, mean age 6 years and 9 months (SD=17.8 months, range 51-106 months). Statistically, there was no difference between the mean ages of the two groups.

**Frankl ratings.** Table 2 shows Frankl ratings for the two groups. There was no significant difference in Frankl rating during LA administration between the two groups (Mann Whitney U Test: Mean U=78; SD=18.38; z=0.0544; p>0.05 (ns)).

**Venham scores.** Table 3 shows the Venham ratings recorded before and after LA administration and the changes which occurred in ratings. There was no statistically significant difference found when the changes for the show and the no-show groups were compared. However, the actual scores show that the show group subjects had a tendency to be more anxious than the no-show group subjects both before and after delivery (Mann Whitney U Test: Mean U=78; SD=18.38; z=0.462; p>0.05 (ns)).

**Discussion**

The advocates of either showing or concealing the dental LA syringe prior to injection have based their attitudes mostly on personal experience. Despite the various comments in the literature and textbooks of paediatric dentistry, this study failed to demonstrate any relationship between showing or concealing the dental LA syringe and anxiety during LA administration. Although the present study is too limited to definitively prove that this particular variable makes no difference during LA delivery, it does suggest that sight of the syringe is not something which needs be avoided at all costs.
Indeed, the results suggest that other variables in operator behaviour, such as empathic approach, appropriate direction, or anxiety on the part of the operator, for instance, might be more important. Such variables have been demonstrated previously to have a significant effect on child behaviour during subsequent dentistry [Getz and Weinstein, 1981; Weinstein, 1982; Glasrud, 1984]. Certainly, the current study supports the hypothesis that the decision to show the syringe or not can be made on the basis of whatever the operator feels it is appropriate or he/she is most comfortable with.

Overall, there was no statistically significant difference in behavioral responses between the show and no-show groups. It may also be that the change from no-show to show has come about because of changing attitudes within society to the management of children. When McBride [1945] was practicing paediatric dentistry, the attitude to the upbringing of children was somewhat different to more recent times. The established guidance of not showing the LA syringe to a child continued until the late 1960s, when opinions began to change. The introduction of much finer disposable LA needles, better anaesthetic solutions and, more latterly, topical analgesia has probably brought about this change in attitude veering more to the show school of thought. At the same time, the mantra ‘tell, show, do’ would presuppose that showing the LA syringe to a child was more in keeping with this behavioural philosophy.

The authors would, therefore, recommend that each dentist should satisfy him or herself as to whether they feel it appropriate to conceal or show the anaesthetic syringe to their paediatric patients and adopt this as part of their behaviour management policy. In any case, in the event of a child patient requesting sight of the LA syringe, the sheathed syringe can probably be shown without fear of this being detrimental to their subsequent behaviour during LA delivery.

**Conclusion**

In this study no relationship was demonstrated comparing anxiety during local analgesia administration and whether or not a child saw the dental syringe before delivery of the local anaesthetic solution.

**References**


