

Comparative Evaluation of Insulin Syringe and Conventional Syringe in Reduction of Pain Perception during Administration of Local Anesthesia in Pediatric Patient

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Abstract

Aim: The aim of the present study was to compare and evaluate the effectiveness of insulin syringe and conventional syringe in reducing pain perception during while giving LA using local infiltration technique.

Materials and Methods: forty children in the age group 6 to 10 years who required LA administration for dental treatment were selected for this study. Patients were randomly divided in two equally group i.e. group I- Conventional syringe group and group II – Insulin syringe group. Pain perception was evaluated using Wong–Baker face scale in both the groups. t- test was used to evaluate the differences in mean pain scores between the groups.

Result: Statistical analysis of the measurements were made using t-test showed that local anesthetic injection using insulin syringe resulted in significantly less pain ($p < 0.05$) in comparison with compared to conventional syringe.

Conclusion: It can be concluded that insulin syringes can be used as an effective means to reduce the intensity of pain during local anesthetic injection in pediatric dental patients.

Keywords: Pediatric dentistry, Local anaesthesia, Conventional syringe, Insulin syringe

Introduction: Pain management during invasive and noninvasive dental procedures is of utmost importance as pain could result in noncompliance and avoidance of treatment. As a result, there is a crucial need to cultivate methods that decrease pain during injection, preventing patients from avoiding dental treatment.¹

Patients who fear dental treatment can induce anxiety and harm the smooth delivery of dental care. Not just the pain and discomfort, the prospect of injection and just looking at a syringe can provoke anxiety particularly in children.²

In dental treatment, pain is more connected with invasive procedures, tooth extractions, and surgeries; however, it is also connected with non invasive procedures. Local anesthetics are used in preventing and controlling the pain and are considered the safest and most effective drugs among all medicines for the prevention and management of pain.

However, the process of administration of these drugs also ignites fear in the patients as many people have a fear of the needle which is used while injecting.¹

The pain due to injection of local anesthetic can be reduced by a number of methods which include reducing the speed of injection, application of counter irritation, varying the rates of infiltration, distraction techniques, buffering and warming the local anesthesia, use of

fine needles with improved syringes, precooling the injection site, application of topical analgesics, and use of mucosal vibrators.³

Therefore, purpose of present study was to evaluate the effectiveness of insulin syringe and conventional syringe in reducing pain perception during administration of local anesthesia in pediatric dental patients.

Material and method: The present in vivo study was undertaken in the Department of Pedodontics and Preventive Dentistry after obtaining the ethical clearance from institutional ethical board. Forty children who met the inclusion criteria were selected for participation in this study.

Inclusion Criteria

- Children having their first dental visit
- Healthy children with no systemic illness, allergies, etc.
- Cooperative child.
- Patient requiring local anesthetic injection for dental treatment either in maxillary or mandibular arch.
- Children with proper parental consent.

Exclusion Criteria

- Children with emergency treatment needs, such as abscess, cellulitis and space infection, and those who needed premedication for receiving dental treatment.
- Medically compromised patient
- Children with behavioural management problem
- Children allergic to local anesthetic agents.
- Children below 6 years of age.

Patient who satisfied the inclusion and exclusion criteria were randomly divided into two groups consisting 20 patients each i.e. Group I- Conventional syringe group (Dispo van) and Group II – Insulin syringe group (30 gauge, Dispo van). (**Figure no. I**) Local anesthetic (LOX × 2% adrenaline) is delivered according to assigned group in the area adjacent to the tooth requiring invasive treatment procedure.

Evaluation was done using Wong–Baker face scale. A subjective scale used to assess pain. A set of six cartoon faces were shown to the child with varying facial expressions ranging from a very smiling face to a very sad face. A brief explanation was given to the child about each face after which the child was instructed to choose the face that best described his/ her feelings while receiving local anesthesia. This scale ranges from 0 to 5, 0 is no pain and 5 is extreme pain. **(Figure no. 2)** The recorded data was compiled, tabulated and subjected to statistical analysis using SPSS software version 17 (IBM, Chicago, United States).



Figure no. 1: Insulin and conventional syringe

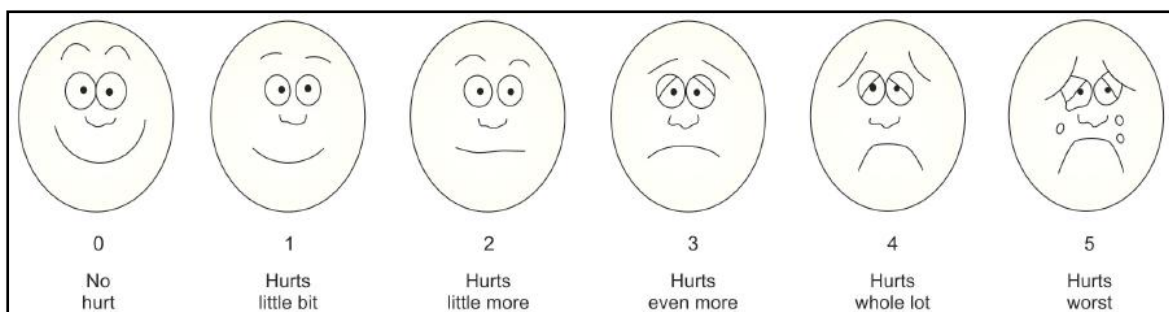


Figure no. 2: Wong–Baker face scale

Result: In present study total 40 children were enrolled; in which 20 children received local anesthesia through conventional syringe and 20 children received through insulin syringe; it was found that the mean pain score in the insulin group (3.01 ± 0.28) was lower than that of

the conventional syringe group (4.18 ± 0.25). (**Table 1**) t-test was used to determine the differences in mean pain scores between the groups. The result obtained was statistically significant with $P < 0.05$, suggesting insulin syringe to be more effective in reducing pain sensation while administration of local anesthesia.

Table: Assessment of pain score		
Group	Mean Pain Score	P Value
Group I - Conventional syringe group	4.18 ± 0.25	$P < 0.05$
Group II - Insulin syringe group	3.01 ± 0.28	

Discussion: The present Study was done to evaluate and compare of pain perception using two different local anaesthetic syringes having different needle gauges. Infiltration technique has been used in this study because of various factors like direct vision of practitioner on it, less depth penetration of needle, less technical errors, less amounts of anesthetic solution, easier application, limited anesthesia of soft-tissues outside the operation field, and shorter duration of being anesthetized and might be used as an alternative to block.^{4,5}

Dental needles are available in three lengths: Long (32 mm), short (20 mm), and ultra short (10 mm). Needle gauges range from size 23 to 30. Needle breakage is a rare occurrence and its primary cause is weakening the needle due to bending it before insertion into the soft tissues and patient movement after the needle is inserted.⁶

In this study, insulin syringes were compared with the conventional syringes. Insulin syringe with its miniature needle, bright colour, and slim look appears like a toy to the child patient till our job of infiltration anesthesia is over. This study overwhelmingly justifies its use in pediatric patients as supported by the child. The use of insulin syringe for injecting LA solution also helps in curtailment of dental appointments in child patients as less time is required for convincing them to receive the injection and gaining their confidence as the syringe looks less menacing.⁷

Results of our study are in accordance to the study conducted by Kaur G et al. (2017)². They found that the diabetic syringes (insulin syringe) exhibit clinical advantage and its use in pediatric dentistry for LA infiltration can prove beneficial for patients as well as for dental caregiver.

Conclusion: Insulin syringes have been found to exhibit a clinical advantage and its use in children for infiltration has been proved to be beneficial.

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Conflict of interest: Author declares that there is no conflict of interest.

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