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RESEARCH ARTICLE

COMPARISON OF THE PAIN INTENSITY ASSOCIATED WITH INJECTION USING STANDARD NEEDLE AND SUPER-FINE 30G SHORT NEEDLE

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ABSTRACT

Aim: Therefore the aim of the present study was to compare the pain intensity associated with local anesthetic injection between standard syringe needle prick and super-fine 30 G short needle prick before periodontal surgery. **Method:** A total of 100 patients with age range of 35-50 years with no previous dental treatment experience requiring need of administration of local anesthesia were randomly selected for examination. The test group (50 patients) received local anesthesia with a standard needle *(DispoVan)® (26x1.5/0.45 X 38 mm)* whereas the control group (50 patients) received local anesthesia with a super-fine 30G short needle *(DispoVan)® (30 G x 5/16 /0.30 X 8 mm).* **Result:** The patients in the test group experienced less pain as compared to the control group. 23 patients in the test group showed a VAS score 1 where as only 2 patients showed a VAS score 1. **Conclusion:** Pain associated with administration of the nasopalatine blocks and greater palatine block may be significantly decreased by using the Insulin syringe. Pain associated with administration of the nasopalatine blocks and greater palatine block may be significantly mitigated by using the Insulin syringe.

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INTRODUCTION

Pathogenic bacteria in dental plaque are responsible for the initiation and progression of periodontal disease by inducing a host mediated inflammatory response (Socransky and Haffajee 1992). Effective and therapeutic removal of bacterial plaque by various treatment modalities requires the use of injected local anesthesia to make the procedure comfortable for the patient and to facilitate the clinician's ability to provide care. The injection of local anesthetic is perhaps the greatest source of patient fear (Milgrom *et al*., 1995 and Al-omari 2009) and inability to obtain adequate pain control with minimal discomfort remains a significant concern of dental practitioners. Despite attempts to diminish this anaesthesia-associated pain, such as by chemically modifying anesthetic agents, adding buffering agents, or changing the anaesthetic temperature during administration. Very little attention has been given to the current syringe design and the administration methods, and effectively, syringe systems have changed a little since their introduction over a century ago. Injection of local anesthetics into dense tissues such as those of the palate is a traumatic experience for most patients (Malamed, 2004). When injecting using the standard syringe needle, the operator encounters significant resistance.

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To overcome this, one needs to apply more pressure on the plunger to deposit the solution. This results in the production of higher pressures within non resilient tissues, leading to pain, ischemia and possible tissue damage (Malamed 2004). The Superfine needles of 30 gauge with a length of 8 mm has been frequently employed for administration of intralesional injections in patients with oral submucous fibrosis. Since injections into fibrosed buccal and retromolar tissues could be made relative ease, it was elected to explore its possible use for painless administration of the palatine blocks. Therefore the aim of the present study was to compare the pain intensity associated with local anesthetic injection between standard syringe needle prick and super-fine 30 G short needle prick before periodontal surgery.

METHOD AND MATERIALS

A total of 100 patients with age range of 35-50 years with no previous dental treatment experience requiring need of administration of local anesthesia were randomly selected for examination. However, systemically unhealthy, anxious and unhealthy patients were excluded from the study. Prior to initiating of this study, the purpose and diagnostic procedure of this clinical trial were explained to the patients and informed consent were taken from the patient to participate in the study.

Study Design: A total of 100 patients undergoing periodontal surgery were included in the study. Prior to administration of

local anesthesia, the selected patients were randomly assigned by a coin flip to the test and control groups each consisting of 50 patients, according to randomized parallel design. The test group received local anesthesia with a standard needle *(DispoVan)® (26x1.5/0.45 X 38 mm)* whereas the control group received local anesthesia with a super-fine 30G short needle *(DispoVan)® (30 G x 5/16 /0.30 X 8 mm).*

Method of Administration: Intraoral preparation of the site was done by povidone iodine solution and a rinse with 0.12% chlorhexidine gluconate. After cleaning and drying the region, experimental site was penetrated with the syringe and few drops of anesthetic solution (Lignocaine 2% with 1:100,000 epinephrine) was deposited. All the patients were explained about the visual analogue scale (VAS) and were asked to rate the pain on the VAS on completion of the anesthetic procedure. Instrumentation to confirm the effectiveness of anesthesia was carried out by an independent observer using a sharp probe applied to the palatal gingival sulcus of central incisors on both sides of the midline.

RESULTS

VAS Score of patients in Test and Control group

Group	VAS 0	VAS 1	VAS 2	VAS 3	VAS 4	VAS 5
Test Group	15	23	12	0	0	0
Control Group	0	2	28	20	0	0

DISCUSSION

The nasopalatine nerve block and the greater palatine nerve block are the commonly administered nerve blocks normally employed for carrying out soft tissue procedures in the palatal regions and as supplemental anesthesia for extraction of upper anterior or posterior teeth. The block is generally administered using a dental cartridge holding syringe or a disposable 3 mL/2 mL syringe and is regarded as a very painful injection (Malamed 2004, Bennet 1990). Pressures generated by conventional syringes have been shown to be as high as 600 psi or even more (Malamed 2004). The density of tissues and the need to penetrate a compact neurovascular bundle have been cited as the most probable reasons for this extreme discomfort. Various other techniques have been proposed to avoid this difficulty including preparatory injections through the interdental papilla between the upper incisors, palatal infiltration bilaterally, computer controlled local anaesthesia delivery. The exact fluid dynamics produced by a computer controlled motor are difficult, if not impossible, to reproduce manually with a syringe.

However, if it were possible to control pressure and rate of local anaesthetic delivery with the use of non conventional manual syringes. It should be possible to mitigate pain and render the nasopalatine and greater palatine block more acceptable to the patient. With this intent, the aim of the present study was to compare the pain intensity associated with local anesthetic injection between standard syringe needle prick and super-fine 30 G short needle prick before periodontal surgery. In the present study 15 patients showed VAS score as 0 as compared to the control group. Even though a thinner (30 gauge) needle was used on the insulin syringe, as compared to the standard disposable syringe (26 gauges), it is likely that lower pain perception in the former was not due to the needle itself. Multiple studies have demonstrated that the perceptions of needle-stick pain from 25, 27 and 30 gauge needles are indistinguishable (Friedman 1999). We believe that it is the design of the insulin syringe which allows a more graded, controlled and fractionated administration without the need for excessive force on the plunger.

Conclusion

The single use insulin syringe is comfortable, cost effective and easily procurable. Through facilitation of a controlled rate of local anesthetic administration, it permits a near painless administration of the nasopalatine and greater palatine block without the need for preparatory injections. The slender syringe with a fine and short needle has the added benefit of good tactile control, and may also appear less threatening to the patient.

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