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Efficacy of a Topical Anaesthetic on Pain during Scaling and Root Planing: A Double Blind Split Mouth Pilot Study in Patients with Periodontitis

(Keberkesanan Pembiusan Setempat ke atas Penskaleran dan Pengetaman Akar: Kajian Rintis Rabun Dua Belah bagi Sebahagian Mulut dalam Kalangan Pesakit Periodontitis)

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ABSTRACT

*Scaling and root planing is one of the most commonly performed procedures in a dental clinic. Most patients will consider the procedure to be causing discomfort or even pain. Intrasulcular topical application of anaesthesia will be preferred over injectable anaesthetic by patients for reduction of pain during scaling and root planing. A double blind split mouth pilot study was designed to find if pain was associated with scaling and root planing and to assess if application of topical anaesthesia reduced the pain. Twenty one patients were enrolled to compare the effect of intrasulcularly applied 20% benzocaine with a placebo in reducing pain during scaling and root planing. Heft Parker Visual analog scale was used to record the level of pain experienced by participants during instrumentation. Independent samples and paired samples t test were used for statistical analysis. There was significant pain associated with scaling and root planing with placebo over baseline (*p*<0.01). There was significant reduction in pain in benzocaine applied side when compared with placebo (*p*<0.001). Pain level approached baseline in benzocaine applied side. In this study, pain was effectively and significantly reduced with intrasulcular application of 20% benzocaine in periodontitis patients.*

Keywords: Anaesthesia; benzocaine; pain; scaling root planing

ABSTRAK

*Penskaleran dan pengetaman akar adalah salah satu prosedur yang paling biasa dilakukan di klinik pergigian. Kebanyakan pesakit akan merasakan bahawa prosedur tersebut adalah kurang menyenangkan atau menyakitkan. Aplikasi bius setempat intrasulkular dijangka lebih digemari oleh pesakit berbanding suntikan anestetik untuk mengurangkan kesakitan semasa pengikisan dan pengetaman akar. Kajian rintis rabun dua belah bagi sebahagian daripada mulut telah direka untuk menentukan sama ada kesakitan adalah dikaitkan dengan penskaleran dan pengetaman akar dan menentukan keberkesanan aplikasi bius setempat dalam mengurangkan kesakitan. Dua puluh satu orang pesakit telah mengambil bahagian bagi membandingkan kesan intrasulkular 20% benzosaine berbanding plasebo dalam mengurangkan kesakitan semasa penskaleran dan pengetaman akar. Skala analog Heft Parker Visual telah digunakan untuk merakam tahap kesakitan yang dialami oleh peserta semasa instrumentasi. Ujian sampel tidak bersandar dan t berpasangan, telah digunakan bagi analisis statistik. Terdapat hubungan yang signifikan bagi kesakitan berkaitan dengan penskaleran dan pengetaman akar di kalangan plasebo pada peringkat dasar (*p*<0.01). Terdapat pengurangan kesakitan yang ketara di bahagian yang diaplikasi benzosaine berbanding dengan plasebo (*p*<0.001). Tahap kesakitan menghampiri nilai dasar di sebelah mulut yang diaplikasi dengan benzosaine. Dalam kajian ini, kesakitan telah dapat dikurangkan secara berkesan dan signifikan dengan aplikasi intrasulkular 20% benzosaine dalam kalangan pesakit periodontitis.*

Kata kunci: Anestesia; benzosaine; kesakitan; pengetaman akar; penskaleran

Introduction

Periodontal disease, including gingivitis and periodontitis, is a dental plaque induced infection (Drisko 2001) which can lead to tooth mortality due to loss of tooth supporting structures (periodontium). Nonsurgical therapy-scaling and root planing (SRP) is the most commonly used procedure for treating gingivitis and periodontitis (Canakçi & Canakçi 2007). The main underlying concept of this therapy is based on the non-specific plaque hypothesis (Loesche 1979) and is the effective and continued elimination of dental plaque. This involves mechanical removal of plaque, calculus (mineralized plaque/tartar); called scaling and necrotic cementum called root planning, by hand or ultrasonic instruments. Very few patients can maintain their periodontal status without the benefit of this regular dental care by professionals, which consists primarily of oral hygiene instructions and non-surgical antiinfective therapy (Listgarten et al. 1985). Scaling is associated with discomfort and pain, while subgingival scaling and root planing appears to be more painful than supra

gingival scaling. This pain occurs due to the excitation of the free nerve endings present in the gingiva which get traumatised during instrumentation. The pain stimulus is then conducted as an impulse along the afferent fibers of the trigeminal nerve (Cranial Nerve V) to the semi-lunar or gasserian ganglion. The impulse is then mediated by the sensory root of the nerve into the pons. Local anaesthesia is the mainstay of pain control during intra oral procedures. Yet only 40% of all periodontal scaling procedures performed involve some kind of anaesthesia (Jeffcoat et al. 2001). Local anesthetics are classified by their chemical structure into esters and amides (Meechan 2008). Ester local anesthetics, such as procaine are no longer in routine use as injectable agents because of the superior qualities and safety of the amide type including lidocaine, articaine and bupivacaine. However, esters such as benzocaine and amethocaine (tetracaine) are employed topically (Meechan 2008). Injectable anaesthetic is more effective (Stoltenberg et al. 2007) yet patients might accept periodontal instrumentation without anaesthesia when a needle prick could be avoided. Topical anaesthesia can fill in this gap. When compared with placebo, topically applied lidocaine-containing bioadhesive patches (Carr & Horton 2001) significantly reduce pain. Anaesthetic in a thermosetting agent (Donaldson et al. 2003; Jeffcoat et al. 2001) was also shown to be effective in controlling pain during scaling and root planing. No studies have evaluated intrasulcular topical anaesthesia against a placebo in reducing pain during instrumentation. Thus this study was done to evaluate pain associated with scaling and root planing and also to evaluate the effect of intrasulcularly applied topical anaesthetic in reducing the pain.

Materials and Methods

The efficacy of a topical anaesthetic delivered subgingivally on pain during scaling and root planing was investigated in 21 periodontitis patients attending the Department of Periodontics, Chhattisgarh Dental College and Research Institute, India, who accepted to be part of a pilot study. The patients were informed beforehand that the procedure can also be done under local anaesthesia. They were also made aware that if they withdraw from the study at any time even without giving reasons, this will not in any way affect their chance of getting treatment in the department. A balanced, randomized, double blind, split-mouth design was used which enabled within-subject comparison of the anaesthetic and the placebo. Pain intensity was evaluated on a 170 mm Heft Parker visual analog scale (VAS) (Heft & Parker 1984).

The inclusion criteria includes persons of 18 to 50 years (both inclusive) were selected if they had no missing posterior teeth (2nd premolar, 1st molar and 2nd molar teeth) in at least a jaw. At least two of the three posterior teeth in each side considered for the trial should have a probing depth of ≥ 5 mm.

The exclusion criteria includes patients with pain, mobility, abscess or endodontic infection. Patients were also excluded if sensitive to benzocaine, currently on any analgesic or had any antibiotic for the past 6 months or pregnant or preferred injectable anaesthetics. Patients requiring antibiotic prophylaxis for probing were also excluded.

The arch, maxillary or mandibular, was selected based on the availability of paired sites, test and control. The selected subjects were enrolled after giving informed consent. The Institutional Ethics Committee gave the approval for the study (Ethics Protocol Number: CDCEC/06/09/12). The study was conducted in accordance with the Helsinki Declaration of 1975, as revised in 2000.

VAS is basically an instrument that measures a characteristic which occurs over a continuum and is not directly measurable. The use of this scale has made it possible to quantify a subjective phenomenon. The scale is usually in the form of a line with the two ends of the line representing the two extremes of the phenomenon to be measured. The line in between the two extremes represents the different degrees of the phenomenon as a continuum and not as discrete values. The participants were explained the VAS based on Heft Parker (Heft & Parker 1984) to record their pain on a line of 170 mm (Figure 1). The line had no numerical markings but had various perceptions of pain with the left extreme position of line as no pain and right extreme as maximum pain that could be ever experienced with moderate at the midpoint. Participants could place a mark anywhere on the VAS scale and use the verbal descriptors as a guide. Each participant mark was assigned a value between 0 and 170 mm on the VAS.

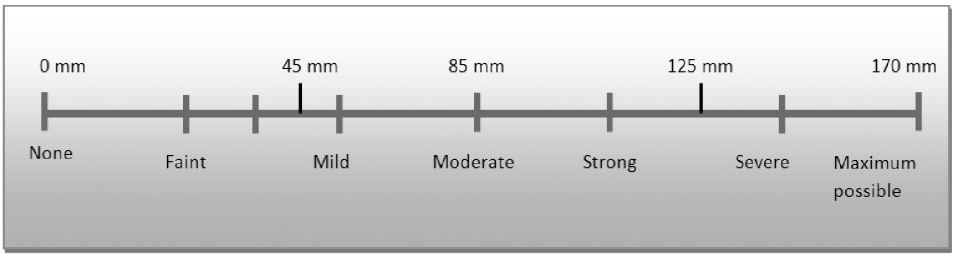

FIGURE 1. Visual analogue scale based on HEFT PARKER PAIN SCALE used to assess in the study. The millimetre markings were not shown in the assessment forms filled by the patients

The side where the anaesthetic is applied (test side) was selected by coin toss. The opposite side was control where the placebo, Oral use of Petroleum jelly, of the same flavour as the anaesthetic was placed. The first area to be treated was always the left side. The study was blinded to the therapist NW and the participants. The two sides were instrumented at least 7 days apart. The patients were free to withdraw from the experiment anytime during the procedure and were excluded.

EVALUATION PARAMETERS

Baseline VAS pain scale value was recorded by the participant. Scaling and root planing was accomplished for the selected 3 teeth in the same appointment. Same sets of instruments were used for all selected subjects. As determined by the therapist NW, a recording on the pain scale was taken as intraoperative, midway during the procedure and a recording post operatively after completion of the procedure. Examiner SS did the pain scale recording. The same procedure was repeated on the right side.

ANAESTHETIC PROCEDURE

The anaesthetic was 20% benzocaine and the entire procured anaesthetic (Mucopain, ICPA, India) were of the same batch of production to avoid any difference in efficacy.

Benzocaine is the ethyl ester of p-aminobenzoic acid (PABA) first synthesized in 1890 by the German chemist Eduard Ritsert. Pain is caused by the stimulation of free nerve endings. When the nerve endings are stimulated, sodium enters the neuron, causing depolarization of the nerve and subsequent initiation of an action potential. The action potential is propagated down the nerve toward the central nervous system, which interprets this as pain. Esters of PABA work as a chemical barrier, stopping the sodium from entering the nerve ending. The placebo was petroleum jelly of the same flavour and it was similar in appearance and viscosity to the test substance. It is a semi-solid mixture of hydrocarbons used as a topical ointment for its healing and protective properties. Examiner NG delivered the anaesthetic substance into the gingival sulcus using a 1.2 cc syringe and an elongated blunt thin canula. The canula was inserted into the periodontal pocket so that the anaesthetic had more chance to reach the depth. The substance was allowed to overflow the pockets and was immediately wiped with a cotton pellet to ensure that no anaesthetic effect was present out of the pocket. Not more than 1.2 mL of anaesthetic was used in a participant in a single appointment. The placebo was similarly placed. Precaution was taken that both the test and control substance were not injected subgingivally. Instrumentation was started 1-2 min after the application of test substance or placebo and a second dose was given if demanded and not more than two times in an appointment. If subjects demanded the anaesthesia more than 2 times, the experiment was aborted for that subject. Following chlorhexidine (0.12%) antiseptic mouthwash, instrumentation was carried out using only hand instruments (curettes and sickles). Instrumentation was completed in each side during the visit. As small number of teeth was to be instrumented, it could be accomplished in a single appointment. An interval of seven days between the test and control side in a subject ensured that recall bias of pain during the earlier instrumentation did not affect the next instrumentation pain recording.

The following information was collected through interview and clinical examination before start of instrumentation. The patients' age, occupation and education status were recorded through interview. The following recordings were made on the selected three teeth on both sides (test and control).

Supragingival calculus was recorded with the following criteria: 0-no calculus; 1- Calculus present less than 1/3 of crown; 2- Calculus less than or upto 2/3 of crown but more than 1/3 and 3- Calculus more than 2/3 of crown.

Subgingival calculus was recorded with the following criteria: 0-no calculus; 1- Subgingival flecks calculus but not a continous band and 2- Continous band of subgingival calculus present.

Bleeding on probing if present within 30 s of probing was marked 1 and 0; the deepest level of attachment from the cementoenamel junction to the base of pocket was recorded; the deepest probing depth was recorded using a periodontal probe and the analysis was done based on the average of the above recordings.

The time taken since the start of instrumentation and intra operative break (Intra operative time) was recorded. Similarly, time taken since the start of instrumentation to its completion (post-operative time) was recorded. This was done for both the control and test sides. The pain scale recording was done on the three occasions, baseline, intraoperative and postoperative for test and control groups.

RESULTS

Student t test and paired t test was used for statistical analysis. No participants asked for more than 2 application of anaesthetic or placebo. Twenty one patients in the age range of 18 to 40 years (mean 25.57±6.554) included 5 female participants. In 15 participants, the maxillary arch was the selected arch. In 9 participants, control side was recorded first. Due to the small sample size, no analysis was done for the above data for significance. No participants reported any local or systemic complications. Periodontitis severity Table 1. The test and control sites were similar in the accumulation of calculus and severity of periodontitis. ($p>0.05$) Duration (time). (Table 2,6,7) The difference between test and control was not significant ($p>0.05$) for both time duration, intra and post operative (Table 2). The postoperative duration was more by 12.714 from Intra operative duration with a SD of 6.018 min for the test side (Table 6). This difference was significant ($p<0.001$) as also in control (Table 7).

TABLE 1. Comparison of disease characteristics, calculus, clinical attachment level and probing depth, between test and control

	Group	N	Mean	SD	Significance (2 tailed)	
Supragingival	Test	21	1.033	0.3053	0.20	NS
	Control	21	0.921	0.2462		
Subgingival	Test	21	0.821	0.2883	0.57	NS
	Control	21	0.770	0.2922		
Level of attachment(mm)	Test	21	5.548	0.5988	0.735	NS
	Control	21	5.486	0.5764		
Probing depth (mm)	Test	21	5.300	0.6017	0.861	NS
	Control	21	5.271	0.4372		

NS-not significant (p>0.05), S*-significant (p<0.05), S**-significant (p<0.01), S*-significant (p<0.001)

TABLE 2. Comparison of duration of scaling root planing between test and control

	Group	N	Mean	SD	Significance (2 tailed)	
Time intra (min)	Test	21	23.86	15.200	0.563	NS
	Control	21	21.52	10.250		
Time post (min)	Test	21	36.57	14.559	0.608	NS
	Control	21	38.90	14.697		

NS-not significant (p>0.05), S*-significant (p<0.05), S**-significant (p<0.01), S***-significant (p<0.001)

Pain scores at baseline, intraoperative and postoperative among groups. (Tables 3, 4 & 5). Table 3 shows the comparison of pain scale values between test and control. The mean values of the pain scale were marginally different in the test and control group for baseline values (T5.33 mm vs. C4.62 mm) and intra operative values (T9.24 mm vs. C12.05 mm). This difference was not significant (p>0.05).

The mean values of postoperative pain scale values differed by 18.81 mm between test and control (T5.57 mm vs. C24.38 mm) and were highly significant (p< 0.001). The pain score was significantly less in the anaesthetic applied group over the placebo group. Table 4 shows the paired analysis of various pain scale values in test side. The mean values show that pain score increased at intra-operative from baseline and fell at post-operative for test side reaching baseline (B5.33 vs. P5.57 mm) and showed no statistically significant difference (p>0.05).

Control side analysis (Table 5) shows that the difference between the means of baseline and post-operative; and intra and post-operative pain scale values was significant (p<0.01), while the difference between baseline and intraoperative was significant at p<0.05. There was significantly more pain in the control side for intra operative and postoperative pain scores from baseline, whereas pain scale values at post operative period reached baseline in the test side.

Almost all results showed a wide standard deviation of means and also wide means difference as a result of the small sample size.

DISCUSSION

This study included 21 patients similar to the Stoltenberg et al. (2007) study. The most commonly used topical anaesthetic agent worldwide 20% benzocaine gel (Al-Melh & Andersson 2007) formed the test substance. Placebo used was petroleum jelly similar to Carr and Horton (2001). The placebo mimics fairly well in consistency and flavour to test substance. A placebo was selected over another anaesthetic for the control side as the objective was to find if pain was associated with scaling and root planing. It is accepted in India that instrumentation done properly on hard surfaces leads to no pain with only 40% of all scaling being done with anaesthesia reported in literature (Jeffcoat et al. 2001). The double blinding ensured no subjective bias influenced the study. The split mouth design ensured that host characteristics did not affect the pain values and enabled a paired analysis (Stoltenberg et al. 2007). No participant asked for more than 2 doses of anaesthetic or placebo. There were 7 dropouts when one appointment was completed, of them 6 participants had the control side instrumented. No analyses were done for the dropout participants and were replaced with new subjects.

The disease status was similar in test and control sides including amount of calculus detected, probing depth and clinical attachment level (Table 1). Severity of disease was similar because of the split mouth study design and hence it did not influence the results.

A visual analogue scale (VAS) (Gould et al. 2009) is a measurement instrument that tries to measure a

TABLE 3. Comparison of pain scale values between test and control

	Group	N	Mean (mm)	SD	Significance (2 tailed)	
Pain scale - base (mm)	Test	21	5.33	8.697	0.793	NS
	Control	21	4.62	8.789		
Pain scale - intra (mm)	Test	21	9.24	10.315	0.381	NS
	Control	21	12.05	10.240		
Pain Scale - post (mm)	Test	21	5.57	7.613	0.000	S***
	Control	21	24.38	19.951		

NS-not significant (p>0.05), S*-significant (p<0.05), S**-significant (p<0.01), S***-significant (p<0.001)

TABLE 4. Paired analysis of pain scale, test

		Mean	N	SD	Significance (2 tailed)	
Pair 1 test	Pain scale - base	5.33	21	8.697	0.042	S*
	Pain scale - intra	9.24	21	10.315		
Pair 2 test	Pain scale base	5.33	21	8.697	0.913	NS
	Pain scale post	5.57	21	7.613		
Pair 3 test	Pain scale - intra	9.24	21	10.315	0.089	NS
	Pain scale post	5.57	21	7.613		

NS-not significant (p>0.05), S*-significant (p<0.05), S**-significant (p<0.01), S***-significant (p<0.001)

TABLE 5. Paired analysis of pain scale, control

		Mean	N	SD	Significance (2 tailed)	
Pair 1 control	Pain scale - base	4.62	21	8.789	0.013	S*
	Pain scale - intra	12.05	21	10.240		
Pair 2 control	Pain scale base	4.62	21	8.789	0.001	S**
	Pain scale post	24.38	21	19.951		
Pair 3 control	Pain scale - intra	12.05	21	10.240	0.002	S**
	Pain scale post	24.38	21	19.951		

NS-not significant (p>0.05), S*-significant (p<0.05), S**-significant (p<0.01), S***-significant (p<0.001)

characteristic that is believed to range across a continuum of values and cannot easily be directly measured. VAS has been used in many studies (Braun et al. 2007; Canakçi & Canakçi 2007; Donaldson et al. 2003; Hoffman et al. 2005; Jeffcoat et al. 2004; Kocher et al. 2005, 2005a; Loomer & Perry 2004; Perry et al. 2005; Saloum et al. 2000; Svensson et al. 1994). The Heft Parker (1984) VAS has been used by DiRenzo et al. (2002), Pihlstrom et al. (1999) and Stoltenberg et al. (2007) and it is simple to administer, reliable and valid. It has been used to evaluate dental pain. Though the scale is subjective, the split mouth design (paired) ensured reliability of the scale. Saloum et al. (2000) in his study recorded pain perception levels with a 4-point visual analog scale while others (Braun et al. 2007; Kocher et al. 2005, 2005a) had assessed on an interval VAS scale ranging from 0 to 10. Many studies (Canakçi & Canakçi 2007; Hoffman et al. 2005; Jeffcoat et al. 2004; Loomer & Perry 2004; Perry et al. 2005; Svensson et al. 1994) used a 100 mm VAS for pain recording. Van Wijk et al. (2004) used numeric pain while Ettlin et al. (2006) also used an electronic visual analogue scales. Braun et al. (2003) measured the subjective intensities of pain with an intermodal intensity comparison and recorded at intervals of 0.5 s. VAS has recall bias compared with the intermodal comparison; yet, the total pain experience and its effect on the participants will be better captured with VAS.

Donaldson et al. (2003) and Stoltenberg et al. (2007) delivered the anaesthetic subgingivally, as in our study. Periodontitis leads to reduced keratinisation of the pocket wall and the susceptibility to topical anaesthetics can vary (Meechan 2008). Hence the dose of anaesthetic at a single appointment did not exceed 1.2 mL as in a study by Stoltenberg et al. (2007). The disease severity or calculus score did not vary between test and control sides. The host variation was controlled by the split mouth study design. There was no significant difference in the duration of instrumentation between test and control side. It should be noted that the standard deviation was >10 for both test

and control, intra and postoperative which showed the great variation in the duration of instrumentation.

Baseline pain scores were similar for test and control in spite of a minimum 7 days difference between the two appointments, similar to Stoltenberg et al. (2007). Intra operative values were also similar. The values were similar as the full effect of the anaesthetic was not present at intraoperative time and instrumentation was less painful during its initial stage. It should be remembered that the therapist decided the intraoperative time. There was significant difference between the mean postoperative pain scores of test and control sides with test values reaching near baseline. There was significant pain experienced by the patients on completion of scaling and root planing without the topical anaesthetic compared with instrumentation with anaesthesia. Participants underwent the full treatment even with mild pain in the control side. This is not interpreted as scaling causes bearable pain as participants who withdrew midway during the experiment were excluded from the study (data not shown). A special mention of the Hawthorne effect need to be made, wherein this observation could be due to the participants being aware that they are part of a study, especially in the control sites where the placebo was used.

Pain scores of test side: all three scores of baseline, intraoperative and postoperative did not show any significant differences on paired sample analysis. The topical application of the anaesthetic had effectively maintained the pain scores at baseline value throughout the procedure as in studies by Svensson et al. (1994) and Al Melh and Andersson (2007). Pain scores of control side showed significant difference between the pain values, baseline and postoperative and intraoperative and postoperative values. There was significant pain experienced when scaling and root planing was done with the placebo. No studies have so far compared a topical anaesthesia with a placebo. Jeffcoat et al. (2001) reported that only 40% of all scaling were done under any anaesthesia. The study showed that instrumentation without an anaesthetic agent is associated with pain.

The present study could not determine the maximum duration of the effectiveness of the topical anaesthetic as well as the amount of reduction of pain. Median reductions in VAS pain intensity in the upper and lower jaw were 58.9% and 61.9% in a study (Svensson et al. 1994).

Examiners for instrumentation and for recording pain scores were different to reduce any influence as in the Stoltenberg et al. (2007) study. Scaling and root planing was performed after waiting 1–2 min as in Stoltenberg et al. (2007) study and was between 30 s and 2 min in Donaldson et al. (2003) and Jeffcoat et al. (2004) studies. The waiting time was needed to allow time for action of anaesthetic. No literature was found on the time taken for an anaesthetic to act when applied subgingivally. Hence the time of 1-2 min was decided based on personal experience and from similar studies (Donaldson et al. 2003; Jeffcoat et al. 2004; Stoltenberg et al. 2007).

Pihlstrom et al. (1999) and Stoltenberg et al. (2007) employed dental students and Loomer and Perry (2004) used hygienists for instrumentation. The therapist in our study was a registered experienced dentist and administered the instrumentation for all the participants. This ensured that inexperience of the therapist would not have influenced the outcome of study by introducing standardization, as was done in Canakçi and Canakçi (2007) study.

Only three teeth were instrumented per appointment to avoid fatigue to the therapist and the participant, which had the potential to influence the outcome. Only hand instrumentation was done to ensure completeness of root planing as in Donaldson et al. (2003) meanwhile Jeffcoat et al. (2004) and Stoltenberg et al. (2007) used hand and ultrasonic instrumentation for their study. Age and sex were not analyzed due to the small sample size. Stoltenberg et al. (2007) found no difference between sex and age.

Placebos that mimic the side effects of the test compound (i.e. numbness, taste) should be preferred whenever possible (Svensson et al. 1994). In the study, the taste was matched for test and control substances. As the placebo does not have a numbing effect, wiping the excess

TABLE 6. Paired analysis of duration of scaling root planing - Test

		Mean (min)	N	SD (min)	Significance (2 tailed)	
Pair 1 test	Time Intra	23.86	21	15.200	0.000	S***
	Time Post	36.57	21	14.559		

NS-not significant ($p>0.05$), S*-significant ($p<0.05$), S**-significant ($p<0.01$), S***-significant ($p<0.001$)

TABLE 7. Paired analysis of duration of scaling root planing - control

		Mean (min)	N	SD (min)	Significance (2 tailed)	
Pair 1 control	Time intra	21.52	21	10.250	0.000	S***
	Time post	38.90	21	14.697		

NS-not significant ($p>0.05$), S*-significant ($p<0.05$), S**-significant ($p<0.01$), S***-significant ($p<0.001$)

anaesthetic immediately reducing the non-numbing effect on other tissues.

Many studies (Al-Melh & Andersson 2007; Carr & Horton 2001; Donaldson et al. 2003; Loomer & Perry 2004; Svensson et al. 1994) on pain had a conflict of interest in way of the manufacturer sponsoring the study. The present study had no conflict of interest.

Our study was probably the first which compared the efficacy of 20% Benzocaine against a placebo. Topical anaesthetics may be preferred over injected anaesthetics for a number of reasons (Stoltenberg et al. 2007). Fear of pain is a common reason patient avoids professional dental care with the sight of an anaesthetic needle having the most fearful experience in dentistry. Topical agents are safe to use on oral mucosa and relatively high concentrations can be used without toxic plasma concentrations. Dental hygienists (depending on their training) cannot perform injections and an effective topical anaesthetic procedure would be a great help (Svensson et al. 1994). Topical anaesthetics if used with other distraction methods can eventually obviate the need for injectable anaesthetics for most patients during scaling and root planing (Frere et al. 2001).

Conclusion

This trial showed that periodontal instrumentation causes pain. The use of topical anaesthesia can effectively reduce this pain. This will greatly reduce the need for injectable anaesthetics and can be replaced by topical anaesthetics for periodontal scaling and root planing. Thus, the use of topical anaesthesia can be recommended for periodontal instrumentation in non-surgical therapy especially for patients who are averse to the use of needles.

References

Al-Melh, M.A. & Andersson, L. 2007. Comparison of topical anaesthetics (EMLA/Oraqix vs. benzocaine) on pain experienced during palatal needle injection. *Oral Surgery Oral Medecine Oral Pathology Oral Radiology Endodontics* 103: e16-e20.

Braun, A., Jepsen, S. & Krause, F. 2007. Subjective intensity of pain during ultrasonic supragingival calculus removal. *Journal of Clinical Periodontology* 34: 668-672.

Braun, A., Krause, F., Nolden, R. & Frentzen, M. 2003. Subjective intensity of pain during the treatment of periodontal lesions with the Vector TM-system. *Journal of Periodontal Research* 38: 135-140.

Canakçi, C.E. & Canakçi, V. 2007. Pain experienced by patients undergoing different periodontal therapies. *Journal of American Dental Association* 138: 1563-1573.

Carr, M.P. & Horton, J.E. 2001. Evaluation of a transoral delivery system for topical anaesthesia. *Journal of American Dental Association* 132: 1714-1719.

DiRenzo, A., Gresla, T., Johnson, B.R., Rogers, M., Tucker, D. & BeGole, E.A. 2002. Postoperative pain after 1- and 2-visit root canal therapy. *Oral Surgery Oral Medecine Oral Pathology Oral Radiology Endodontics* 93: 605-610.

Donaldson, D., Gelskey, S.C., Landry, R.G., Matthews, D.C. & Sandhu, H.S. 2003. A placebo controlled multi-centred evaluation of an anaesthetic gel (Oraqixs) for periodontal therapy. *Journal of Clinical Periodontology* 30: 171-175.

Drisko, C.H. 2001. Nonsurgical periodontal therapy. *Periodontol 2000* 25: 77-88.

Ettlin, D.A., Ettlin, A., Bless, K., Puhan, M., Bernasconi, C., Tillmann, H.C., Palla, S. & Gallo, L.M. 2006. Ibuprofen arginine for pain control during scaling and root planing: A randomized, triple-blind trial. *Journal of Clinical Periodontology* 33(5): 345-350.

Frere, C.L., Crout, R., Yorty, J. & Mcneil, D.W. 2001. Effects of audiovisual distraction during dental prophylaxis. *Journal of American Dental Association* 132: 1031-1038.

Gould, D., Kelly, D., Goldstone, L. & Gammon, J. 2001. Examining the validity of pressure ulser risk assessment scales: Developing and using illustrated patient simulations to collect the data INFORMATION POINT: *Visual Analogue Scale*. *Journal of Clinical Nursing* 10(5): 697-706.

Heft, M.W. & Parker, S.R. 1984. An experimental basis for revising the graphic rating scale for pain. *Pain* 19: 153-161.

Hoffman, A., Marshall, R.I. & Bartold, P.M. 2005. Use of the vectort scaling unit in supportive periodontal therapy: A subjective patient evaluation. *Journal of Clinical Periodontology* 32: 1089-1093.

Jeffcoat, M.K., Geurs, N.C., Magnusson, I., MacNeill, S.R., Mickels, N., Roberts, F., Robinson, P., Salamati, A. & Yukna, R. 2001. Intrapocket anaesthesia for scaling and root planing: Results of a double-blind multicenter trial using lidocaine prilocaine dental gel. *Journal of Periodontology* 72(7): 895-900.

Kocher, T., Fanghanel, J., Schwahn, C. & Ruhling, A. 2005. A new ultrasonic device in maintenance therapy: Perception of pain and clinical efficacy. *Journal of Clinical Periodontology* 32: 425-429.

Kocher, T., Rodemerk, B., Fangha¨nel, J. & Meissner, G. 2005a. Pain during prophylaxis treatment elicited by two power-driven instruments. *Journal of Clinical Periodontology* 32: 535-538.

Listgarten, M.A., Schifter, C.C. & Laster, L. 1985. 3-year longitudinal study of the periodontal status of an adult population with gingivitis. *Journal of Clinical Periodontology* 12(3): 225-238.

Loesche, W.J. 1979. Clinical and microbiological aspects of chemotherapeutic agents used according to the specific plaque hypothesis. *Journal of Dental Research* 58(12): 2404-2412.

Loomer, P.M. & Perry, D.A. 2004. Computer-controlled delivery versus syringe delivery of local anaesthetic injections for therapeutic scaling and root planing. *Journal of American Dental Association* 135: 358-365.

Magnusson, I., Jeffcoat, M.K., Donaldson, D., Otterbom, I.L. & Henriksson, J. 2004. Quantification and analysis of pain in nonsurgical scaling and/or root planing. *Journal of American Dental Association* 135(12): 1747-1754.

Meechan, J.G. 2008. Intraoral topical anaesthesia. *Periodontol 2000* 46: 56-79.

Perry, D.A., Gansky, S.A. & Loomer, P.M. 2005. Effectiveness of a transmucosal lidocaine delivery system for local anaesthesia during scaling and root planing. *Journal of Clinical Periodontology* 32: 590-594.

Pihlstrom, B.L., Hargreaves, K.M., Bouwsma, O.J., Myers, W.R., Goodale, M.B. & Doyle, M.J. 1999. Pain after periodontal scaling and root planing. *Journal of American Dental Association* 30: 801-807.

Saloum, F.S., Baumgartner, C.J., Marshall, G. & Tinkle, J, 2000. A clinical comparison of pain perception to the Wand and a traditional syringe. *Oral Surgery Oral Medicine Oral Pathology Oral Radiology Endodontics* 89: 691-695.

Stoltenberg, J.L., Osborn, J.B., Carlson, J.F., Hodges, J.S. & Michalowicz, B.S. 2007. A preliminary study of intra-pocket topical versus injected anaesthetic for scaling and root planing. *Journal of Clinical Periodontology* 34: 892-896.

Svensson, P., Petersen, J.K. & Svensson, H. 1994. Efficacy of a topical anaesthetic on pain and unpleasantness during scaling of gingival pockets. *Anesthesia Progress* 41: 35-39.

Van Wijk, A.J., Duyx, M.P.M.A. & Hoogstraten. 2004. The effect of written information on pain experience during periodontal probing. *Journal of Clinical Periodontology* 31(4): 273-281.

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