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## **Efficacy of indigenously prepared 10% piper betel gel in pain reduction during periodontal probing: A split mouth study**

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### **Abstract**

**Introduction:** Periodontal probing is a crucial component of the periodontal examination that identifies the severity of the illness, but it can be painful and uncomfortable for individuals suffering from periodontitis. Even though betel leaves have been used extensively to treat a variety of diseases, their anaesthetic properties have not been thoroughly studied.

**Aim:** To evaluate the anesthetic effect of 10% *Piper betel* gel versus 2% lignocaine gel in the reduction of pain, during probing in periodontitis patients.

**Methodology:** 20 systematically healthy subjects were enrolled in the study with generalized probing pocket depth of  $\geq 4$ mm. Patients were randomly divided into 2 groups; Group A- 10% *Piper betel* gel and Group B- 2% lignocaine gel. After delivering the gel into the pocket, periodontal probing was carried out after 30 seconds using UNC-15 probe. Visual analog scale (VAS) and verbal rating scale (VRS) were recorded.

**Results:** The results of this study shows that *Piper betel* gel is as effective as lignocaine gel in reducing pain during periodontal probing.

**Conclusion:** Intra-pocket administration of *Piper betel* gel is effective for pain control during pocket probing in periodontitis patients. As it is a herbal formulation, it can be used to avoid the side effects of lignocaine.

**Keywords:** Periodontal probing, piper betel, herbal, anaesthesia, lignocaine

### **Introduction**

The most important factors for detecting periodontium in both health and sickness are clinical attachment level and probing pocket depth. PPD and CAL are used to evaluate and examine any response to periodontal care. The periodontal pocket is defined as a pathologically deepened gingival sulcus. The junctional epithelium extends apically and a pocket epithelium forms as a result of the disease process; detaching and destroying the periodontal ligament, causing an aberrant apical expansion of the gingival sulcus. (AAP, 1992) [1].

For the majority of patients, periodontal probing is a very painful treatment because the periodontal tissues are inflamed and have increased vascularity [2]. Histologic studies in a patient with untreated periodontitis have found that the base of the pocket, which is highly infiltrated with inflammatory cells, is where the periodontal pocket penetrates the epithelium into the surrounding connective tissue [3]. The Visual Analogue Scale (VAS), which is a valid, highly dependable, and simple to use tool, is frequently used to quantify or analyse pain in studies. According to one study that examined gingival inflammation and the discomfort associated with periodontal probing, the level of periodontal inflammation influences how painful and uncomfortable the procedure is. Additionally, during periodontal probing, patients exhibiting more gingival inflammation suffer more pain and discomfort [4].

There are currently very few chairside methods for reducing discomfort during periodontal probing. One approach is local anaesthesia using the infiltration technique, however this has the drawback of a longer duration of anaesthesia and requires numerous penetrations for complete mouth probing, making it impracticable.

Jellies, sprays and ointments are some of the more recent innovations used to accomplish this goal. Patients appreciate these methods more than traditional injection techniques since they are more patient-friendly, easy to apply, and don't cause lingering numbness<sup>[5]</sup>. There are currently many intrapocket anaesthetic gels available, including lidocaine, prilocaine, lignocaine, benzocaine, etc. There are numerous herbal compounds with anaesthetic properties, such as *peppermint*, *tulsi*, *ginger*, and *clove*. One such herbal substance which is easily available in the tropical countries like India is betel leaf, often known as "*paan*," which has anaesthetic properties that have not yet been studied as an intrapocket anaesthetic gel. The use of this anesthetic gel has not been evaluated for purposes of anesthesia for full-mouth probing procedures. Hence, the aim of the present study is to evaluate the efficacy of indigenously prepared 10% *Piper betel* gel in pain reduction during periodontal probing in periodontitis patients.

### Materials and Method

The study was a split-mouth clinical trial that compares the action of herbal anesthetic gel as compared to Lignocaine gel while probing in untreated periodontitis patients. The study was conducted in Department of Periodontology and Oral Implantology at Pacific Dental College and Hospital, Udaipur, Rajasthan, in August 2022 and completed in September 2022. The study was approved by institutional ethical committee (Ref no. PDCH/23/EC-01).

### Study Population

20 participants (10 males and 10 females) aged 18-65 years of age were recruited from the Out Patient Department of Periodontics of Pacific Dental College and Hospital, Udaipur in relation to their periodontal condition. The participants were informed about the procedure and a verbal consent was obtained.

At the screening visit, the examiner performed routine thorough intra-oral and extra-oral examination along with recording detailed case history and if indicated, radiographic examination. A periodontal screening was also performed to identify patients with periodontitis<sup>[6]</sup>.

Inclusion criteria were: 1) 18 to 65 years of age 2) Generalized probing depth  $\geq 4$ mm 3) Patients should not have undergone SRP/detailed periodontal treatment in the previous 12 months 4) Patients who had given written consent. The following participants were excluded from the study: 1) Those suffering from any systemic diseases. 2) Pregnant & lactating women. 3) Allergy from herbs or lignocaine allergy 4) Those taking non-steroidal anti-inflammatory drugs in the 3 days before participation in the study.

Out of 42 patients examined, 20 met the inclusion criteria and were enrolled in the study. The Quadrants were randomly divided using coin toss method into Test group (*Pb* gel group, 20 patients) and Control group (*Lg* gel group, 20 patients). The *Pb* gel was indigenously prepared in the Department of Pharmacy at Pacific Institute of Medical Sciences, Umarda. As a control, commercially available 2% Lignocaine Hydrochloride gel (Intacaine 2%®) was used.

Preparation of Piper betel gel:

Fresh betel leaves were collected from a nearby nursery. The leaves were then thoroughly cleaned, allowed to dry in the shade for 15 days, then sieved and ground into a coarse powder. Two steps were taken to prepare the gel.

**Stage 1:** Soxhlet extraction: Dried 40 g of powder, A filter paper thimble containing betel leaf powder was inserted in a

Soxhlet chamber. The receiving flask was filled with 400 ml of ethanol in a 1:10 ratio, which serves as the solvent, and heated to a regulated temperature in a water bath. The liquid level in the syphon tube rises when ethanol vapours enter the chamber through the distillation arm and arrive there. The liquid is pulled into the receiving flask when the liquid level in the syphon tube is equal to the extract level. This procedure was carried out for 6 hours (about 20 to 30 syphon cycles) until the active ingredients could be entirely extracted. The needed soft extract was produced by evaporating the solvent from the acquired extract in the receiving flask using a hot plate unit.

**Stage 2:** Preparing the gel The leaf extract was added to a carbopol gel that was 1:1 w/w in weight. 100 mg of carbopol was added to a clean beaker with 10 ml of distilled water during the manufacture of the gel, and the mixture was swirled to evenly distribute the agent. The carbopol was dissolved by sonicating the mixture for 5–6 minutes. The creation of a clear, translucent gel showed that the resultant solution had been neutralised by adding triethanolamine dropwise to reach the appropriate pH. To get the appropriate consistency, approximately 1 g of the extract was lavigated with carbopol gel gently.<sup>[7]</sup>



**Fig 1:** Fresh *piper betel* leaves



**Fig 2:** Dried betel powder



**Fig 3:** 10% *Piper betel* gel



**Fig 4:** Lignocaine jel (Intacaine 2%)

**Procedure**

Due to the split mouth study design, anaesthetic gels were administered to the test (*Pb*) and control (*Lg*) quadrants. The applicator tip of a 2 mm syringe with a blunt-ended needle was used to load both gels. Using cotton rolls, the quadrant was dried, isolated appropriately, and rendered saliva-free. The periodontal pockets were then filled with the test or control gel. Central incisors were not applied gel to prevent cross-side contamination with either test or control gels. Before starting to probe, the gel was applied and left in place for 30 seconds. A UNC-15 probe was used to quantify the depth of the periodontal pockets at six different locations on each tooth. The gels were removed using water spray once all the measurements had been taken and recorded. After washing the gel, independent data for the test and control locations were collected using the Visual Analogue Scale (VAS) and Verbal Rating Scale (VRS).



**Fig 5:** Intra-pocket delivery of *Pb* gel



**Fig 6:** Pocket probing following gel application



**Fig 7:** Intra-pocket delivery of Lignocaine gel



**Fig 8:** Pocket probing following gel application

**Statistical analysis**

The recorded data was compiled and descriptive statistics and data analysis was performed using SPSS software version 2.0 by an experienced statistician. Student’s paired t-test was used for basic analysis for test and control groups respectively. Result was considered statistically significant if the P-value was  $\leq 0.005$ .

**Results**

**Table 1:** Patient Demographics

	Avg Value (years)	Range (years)
Age (Years; Mean $\pm$ SD)	40.2 $\pm$ 9.59	30-64

**Table 2:** Comparison of Visual analog scale scores for Test and control gels

	Mean $\pm$ SD	P value
Test group	12.75 $\pm$ 7.66	P = 0.000
Control group	28 $\pm$ 9.79	

**Table 3:** Comparison of Verbal rating scale scores for Test and Control gels

	Mean $\pm$ SD	P value
Test group	0.95 $\pm$ 0.38	P = 0.005
Control group	1.25 $\pm$ 0.43	

The total number of patients assessed was 42; out of which 20 were selected for the study based on inclusion and exclusion criteria. No adverse effects were seen in any patients after intra-pocket gel delivery. The values are represented as Mean  $\pm$  SD.

**Demographic Data**

Patient demographics data (Table 1) shows patients with the age range of 18-65 years (Mean  $\pm$  SD = 40.2 $\pm$ 9.59).

**Assessment of Pain**

Comparison of Visual analog scale (VAS) scores for the test and control showed the Mean  $\pm$  SD for Test group was 12.75 $\pm$ 7.66 which was lower than that of control group 28 $\pm$ 9.79 showing highly statistically significant results. (P = 0.000) (Table 2). Comparison of Verbal rating scale(VRS) score for the test and control group showed the Mean  $\pm$  SD for Test group was 0.95 $\pm$ 0.38 which was also lower than that of control group 1.25 $\pm$ 0.43 showing statistically significant results (P = 0.005) (Table 3).

Both these results suggests that *Pb* gel is more effective than *Lg* gel as an intra-pocket anesthetic in reducing pain while periodontal probing in periodontitis patients.

**Discussion**

The *Piper betel* (betel) is a vine of the family *Piperaceae*, which includes *pepper* and *kava*. Southeast Asia is the native

habitat of the betel plant. It is a perennial with glossy heart-shaped leaves and white catkins that is evergreen. Plants known as betel are grown for their leaves, which are most frequently used as flavour when chewing areca nuts. There are numerous studies that describe the chemical make-up of betel leaves and evaluate the pharmacological effects and pathological alterations that betel leaf ingestion causes in the body. It contains essential amino acids, tannins, minerals, enzymes, glycosides, and scented oil. Betel is said to have astringent, aphrodisiac, laxative, antibacterial, mucolytic, anti-inflammatory, and euphoric characteristics, according to research on its diverse pharmacological effects. It is common knowledge that chewing betel leaves causes mouth numbness, which raises the possibility of a local anaesthetic effect. It has been reported that chewing betel momentarily dulls the buccal mucous membrane's sense of taste and sensitivity [8].

The main aim of this study is evaluate the efficacy of indigenously prepared 10% *Piper betel* gel in pain reduction during periodontal probing in periodontitis patients. Through VAS and VRS pain scoring, the results showed a highly significant decrease in the patient's perception of pain for the side of the mouth with the test gel compared to the side of the mouth with the control gel.

The split-mouth design was adopted in the current study. Because we are dealing with within-patient variations and the patient is essentially serving as his or her own control by reporting the identical VAS pain values for the test and placebo gel, this considerably improves the efficiency of statistical testing.

The VAS is the major tool used in the current study to score pain and assess the effectiveness of the anaesthetic gel. Despite the fact that the VAS is accurate, sensitive, repeatable, easy to quantify, and susceptible to statistical analysis, it is crucial to understand that pain is a subjective experience [9].

Betel leaf extract gel is effective in reducing pain and can function as an alternative topical anaesthetic agent, according to a study that investigated whether children aged 6 to 10 years old perceived pain after topical application of clove oil, betel leaf extract, lignocaine gel, and ice prior to intraoral injection [7].

Another study examined the local anaesthetic effects of betel leaf extract alone and in combination with betel nut using infiltration and surface anaesthesia and it was discovered that betel leaf has strong local anaesthetic effects utilising both infiltration and surface anaesthesia techniques [10].

In the present study The Visual analog scale scores for test and control groups were  $12.75 \pm 7.66$  and  $28 \pm 9.79$  respectively and the P value obtained was statistically highly significant ( $P = 0.000$ ). The Verbal rating score for test and control groups were  $0.95 \pm 0.38$  and  $1.25 \pm 0.43$  respectively and the P value obtained was statistically highly significant ( $P = 0.000$ ). The obtained results indicate that *Pb* betel can be effectively used as an anesthetic agent in reducing pain as an intra-pocket anesthetic gel. The results of the present studies are in accordance with both the above-mentioned studies that proved anesthetic effect on *Piper betel* in Oral screening procedures.

## Conclusion

10% *Piper betel* gel provides a statistically significant reduction in pain while periodontal probing in patients with periodontitis. The findings of this study suggested that *Pb* gel can be used as a herbal alternative to Lignocaine for reducing pain while periodontal examination. Additional studies should

be conducted on a large scale to understand the anesthetic effect of *Piper betel* gel accurately.

**Conflict of interest:** None

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## References

1. Khan S, Cabanilla LL. Periodontal probing depth measurement: a review. *Compend Contin Educ Dent*. 2009;30:12-4.
2. Ajmix M, Bogle G, Cole R, Rathbun E, Riggs M, Egelberg J. Ability of examiners to estimate the pain experienced by patients from probing during initial periodontal examination. *J Periodontol*. 2005;76:985-90.
3. Fowler C, Garrett S, Crigger M, Egelberg J. Histologic probe position in treated and untreated human periodontal tissues. *J Clin Periodontol*. 1982;9:373-85.
4. Heft MW, Perelmuter SH, Cooper BY, Magnusson I, Clark WB. Relationship between gingival inflammation and painfulness of periodontal probing. *J Clin Periodontol*. 1991;18:213-5.
5. Van Steenberghe D, Bercy P, Boever J, Adrieans P, Geers L, Hendrickx E. Patient evaluation of a novel non-injectable anesthetic gel: a multicenter crossover study comparing the gel to infiltration anesthesia during scaling and root planing. *J Periodontol*. 2004;75:1471-8.
6. Frisco C, Bramson J. Periodontal screening and recording perceptions and effects on Practice. *American Academy of Periodontology Chicago*. 1993;124(7):226-232.
7. Havale R, Rao DG, Shrutha S, Tuppadmath K, Tharay N, Mathew I. Comparative evaluation of pain perception following topical application of clove oil, betel leaf extract, lignocaine gel, and ice prior to intraoral injection in children aged 6-10 years: a randomized control study. *J Dent Anes Pain Med*. 2021;21:329-336.
8. Chopra R, Chopra I, Handa K, Kapur L. *Tribulus Terrestris*. *Chopra's Indigenous Drugs of India*, UN Dhar & Sons Pvt. Ltd, Calcutta; c1958. p. 430.
9. Hashem AA, Claffey NM, O'Connell B. Pain and anxiety following the placement of dental implants. *Int J Oral Maxillofac Implants*. 2006;21(6):943-50.
10. Krishnakumar S, Geetha V, Kuruvilla A. Determination of local anesthetic action of Betel leaf extract alone and with Betel nut using infiltration and surface anesthesia. *J Nat Med*; c2001. p. 28-32.

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