



Effects of Acupressure as an Adjunct to Oral Prophylaxis in Treatment of Gingivitis: A Randomized Case-control Study

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Abstract

Background: Acupressure is a branch of acupressure which is a key component of Traditional Chinese Medicine. It is a form of alternative medicine that claims to provide treatment for gingivitis, periodontal disease, halitosis, dental pain, facial palsy, gag reflux and other diseases of the oral cavity. **Aim:** The objective of the study was to assess the effect of acupressure as an adjunct to oral prophylaxis in treatment of gingival inflammation and compare its efficacy with solitary conventional scaling. **Materials and Methods:** A total of 50 age-matched adolescents with gingivitis were chosen for the study. They were randomly allocated into control or solitary oral prophylaxis group (Group A) and intervention or acupressure group (Group B). Silness and Loe Gingival Bleeding Index was recorded for 50 subjects prior to the treatment. Group A underwent oral prophylaxis only. Group B underwent oral prophylaxis and performed acupressure therapy twice a day for 14 days. Silness and Loe Gingival Bleeding Index was recorded again after 21 days. **Results:** There is a considerable reduction of gingival bleeding scores in acupressure group compared to control group. The mean difference between baseline and after intervention scores of Gingival Index in control is 1.57 ± 0.286 and in test is 1.73 ± 0.152 with the p value ($<0.001^*$). **Conclusion:** Acupressure could be served as a valuable adjunct to oral prophylaxis in treatment of gingival inflammation. It might serve as a valuable adjunct to conventional scaling by enhancing host-mediated response. Its efficacy in analgesia can be utilized to minimize post-operative pain. Prospective studies with more number of participants are needed for further validation.

Keywords: Acupressure, Acupuncture, Alternate Therapy, Gingivitis

1. Introduction

Acupressure is a part of Traditional Chinese Medicine advocating the use of localized pressure in specified points of the body to alleviate illness¹. It has been in use

for over centuries. According to Jayasuriya², it was first described in the book Huang Di Nei Jing (The Yellow Emperor's Classic of Internal Medicine), an emperor who lived from 2697 -2596 BC.

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According to ancient Chinese texts, 'qi' - life energy is composed of a 'yin' and 'yang' which flows around 'meridians' of the body. Imbalance of this 'yin' and 'yang' supposedly leads to disease. Research now equates 'yin and yang' to the sympathetic and parasympathetic system. Application of acupressure in treatment of disease which leads to the correction of imbalances in 'yin-yang' leading to alleviation of disease³.

Acupressure is a part of acutheraPy along with acupuncture. Acupressure involves localized application of pressure at specified points in the body. This does not require needle puncture as needed in acupuncture therapy. This increases patient compliance and comfort.

Significant evidence exists for the benefits of acupressure in the control of pain⁴⁻⁸. It was initially believed to be only a placebo, but now it has been proved to be much more⁹. Research has now proven it to be based on gate control theory of pain in a way similar to acupuncture¹⁰. Localized pressure application leads to local inflammatory reaction. This stimulates A delta fibres. These fibers terminate in the substantia gelatinosa of dorsal horn of grey matter of spinal cord¹¹. Enkephalin release as a consequence of this stimulus blocks pain perception from other stimuli¹²⁻¹⁴.

In vivo rodent studies have also proven it to suppress expression of pro-inflammatory cytokines in GCF of rats¹⁵. A recent pragmatic randomized crossover pilot clinical trial on children suggested that auricular acupressure with magnetic seeds improves the efficacy of habit reversal treatment for nail biting with significantly better simplified gingival index scores and other outcomes¹⁶. In human in vivo studies, acutheraPy has shown increased levels of IgG in GCF¹⁷. So the role of acupressure as an adjunct in treatment of inflammation may be significant. Gingivitis, a disease of inflammatory origin has plaque elimination as corner stone of treatment. Acupressure which has proven anti-inflammatory role may be used as a valuable adjunct. Limited literature exists which assess the efficacy of acupressure in dental therapy. Hence a preliminary study was conducted to assess its effects.

2. Materials and Methods

A randomized, controlled study was scheduled to evaluate the efficacy of acupressure as an adjunct in

the treatment of gingivitis. The study was done after registering the institutional ethics review board. A total of 100 adolescents were screened for gingivitis in an around Coimbatore. Basic case history inclusive of past medical history, recent antibiotic exposure, dental history, recent scaling procedures and brand of toothpaste used were assessed. 50 subjects were chosen for the case-control study based on inclusion and exclusion criteria. The participants were trained to perform the acupressure by an accutheraPy A written consent was obtained from the participants.

3. Inclusion Criteria

- Age group of 18 to 25 years.
- Minimum 20 Natural teeth in permanent dentition.
- Mild to moderate gingivitis
- Subjects who were willing to do acupressure as instructed for 14 days (for group A)

4. Exclusion Criteria

- History with Antibiotic use in past 3-4 weeks
- History of mouth wash used in past 3-4 weeks
- History of dental treatment in the past 3-4 weeks.
- Pregnant and lactating women
- Medically compromised patients
- Smokers - Past and present
- Aggressive periodontal disease patients

The participants of the study were assigned into two groups based on simple random allocation. Group A (control/scaling group) included 25 subjects and Group B (intervention/ acupressure group) and included another 25 subjects. Pre-treatment gingival bleeding scores were assessed using Silness and Loe bleeding index-1963 for both groups. The assessment was done by clinician, Group A underwent ultrasonic scaling as solitary treatment. Group B underwent scaling and performed acupressure at specified points twice a day for 2-3 minutes for 14 days. The acupressure was done by patients who were trained by a acupuncture specialist with a MD in acupressure. The patient compliance was also inquired during the study and it was satisfactory. Gingival bleeding scores were assessed after 21 days by a clinician who was unaware of the test and control group.

Acupressure points for gingivitis include ST6 (Chiache), ST 7 (Xiaguan), ST 44 (Leiting) ,ST 45 (Lidui)¹⁷. Figure 1 depicts the points of acupressure used in this study for gingivitis management.

ST 6 Chiache: It is the most prominent point on the masseter muscle palpable on clenching

ST 7 Xiaguan: It is the depression on the lower border of the zygomatic arch.

ST 44 Neiting, Analgesic point: It is present 0.5 cun proximal to the web margin between the 2nd and 3rd toes.

ST 45 Ludui, Sick Mouth: It is present in the foot, on the lateral side of the end of the second toe 1 cun from the corner of the nail.

Participants were trained by acupressurist. The participants of the study were asked to apply digital pressure at these four points for 2-3 min twice a day for 14 days. The participant's compliance were ensured during the study period.

5. Results

The data were coded and analyzed using the Statistical Package for the Social Sciences (SPSS, ver. 20.0; SPSS Inc., Chicago, IL, USA). Analysis was done between two coded groups. The Scaling was assigned Group A and Scaling and Acupressure treatment was assigned as Group B. Results were further interpreted on this basis. Statistical analysis consisted of testing the intragroup and intergroup differences between the two groups. The paired samples student 't' test was applied for testing significant intragroup associations between the Gingival Index scores in the control and experimental groups. Intergroup comparison to check whether the post-intervention means, adjusted for pre-intervention scores, differ between the two groups; was done using Analysis of Covariance (ANCOVA). The level of statistical significance was kept at $P \leq 0.05$. Table 1 explains the comparison of change in mean gingival index scores within and between two groups.



Figure 1. The points of acupressure used in this study for gingivitis management.

Table 1. Comparison of change in mean gingival index scores within and between two groups

Data	Group A – (Control)	Group B –(Intervention/ Acupressure)	P Value (Group A vs Group B)
Baseline	1.72±0.236	1.76±0.159	0.415 (NS)
After Intervention	0.15±0.117	0.03±0.041	-
Mean Difference between baseline and after intervention scores of Gingival Index	1.57±0.286 <0.001*	1.73±0.152 <0.001*	<0.001*

Significant-*; Not Significant -NS

In the control group , when compared the Gingival Index scores before and after scaling there was a significant reduction in the scores, $t(24)= 27.418$, $p<0.001^*$

In the experimental, when compared the Gingival Index scores before and after scaling there was a significant reduction in the scores, $t(24)= 56.890$, $p<0.001^*$

There is no significant difference when the baseline gingival index scores are compared between the two groups $F(1,47)=0.677$, $p= 0.415$

There are statistically significant differences in post-intervention gingival index scores (i.e., the dependent variable) between the groups (i.e., the independent variable) when adjusted for pre-intervention gingival scores (i.e., the covariate), $F(1,47)=22.49$, $p=<0.00$

6. Discussion

Dental plaque is the primary etiology for gingival inflammation. It is a biofilm consisting of bacteria, bacterial metabolites and toxins and other oral debris. The pathogenic bacterial component along with its toxins is responsible for irritation of the underlying gingival epithelium. Pathogenic challenge initiates an immune mediated host response. Host mediated response acts as a barrier against further ingress of pathogenic bacteria. Primary mechanisms of this response involve mechanical and immunological action of GCF and saliva. Secretory IgA plays the key role in antipathogenic activity of saliva. Serum and crevicular fluid IgG plays a vital protective action as well. If this host mediated immune response is overwhelmed by plaque bacteria, gingival inflammation ensues. This is characterized by changes in colour, size, shape,

consistency and contour of the gingiva. Gingivitis initially being subclinical is often neglected by the patient. This leads to further progression of this disease into the irreversible periodontitis. This is depicted by increase in probing depths, recession of gingival margins, and alveolar bone loss.

Treatment for gingivitis includes prevention of plaque accumulation and its early intervention. This treatment aims at reducing the bacterial load at the plaque-gingival interface. Another aspect of treatment may also be considered. This involves enhancing host-mediated immune response. Elevation of IgG levels in serum and gingival crevicular fluid could be beneficial in the treatment of gingivitis. Elevation of IgG levels lead to better host-mediated immune response against plaque pathogens and hence could be effective in the treatment of gingivitis as an adjunct to routine oral prophylaxis. However any attempt in enhancing host-mediated immune-response should always be accompanied by oral prophylaxis as removal of plaque is the corner stone in treatment of gingivitis and periodontitis. An alternative therapy to enhance host-mediated response may act only as a valuable adjunct to solitary scaling.

Acupuncture may serve a major role in this aspect of treatment. Pro-inflammatory cytokines such as IL-1, IL-6 and TNF alpha are responsible for mediating periodontal destruction. Acupuncture has been proven to reduce periodontal breakdown by reduction of expression of pro-inflammatory cytokines in rats¹⁵. It may be a valuable alternative therapy that may be used to enhance host-mediated response. Chronic acupuncture treatment leads to elevated levels of IgA and IgG in gingival crevicular fluid¹⁸. This could possibly aid in better host response against pathogens

responsible for gingivitis. Acupressure, having the same mechanism as acupuncture could elicit these effects also. Acupressure has also showed an analgesic role due to blockade of pain conductance^{19,20}. This could further be used to minimize post-operative discomfort following periodontal therapy.

Being a non-invasive painless procedure which can be easily executed on the patient, acupressure should be further explored in its application in periodontal therapy. The reported patients compliance were satisfactory during the study and there were no adverse effects. The limitations of this study were the less number of patients assessed and also the evaluation of immunoglobulins in GCF was not assessed.

7. Summary and Conclusion

Acupressure by itself cannot eliminate the etiology of gingivitis, it cannot replace scaling. Scaling remains the cornerstone in the treatment of gingivitis, however, it can serve as a valuable adjunct to conventional scaling by enhancing host-mediated response. Its efficacy in analgesia can be utilized to minimize post-operative pain. The application of acupressure if further explored to reduce post operative pain following flap surgery and other painful conditions like pericoronitis. The measurement of GCF inflammatory biomarker before and after acupressure therapy might provide conclusive evidence for the outcome of the acupressure therapy as an adjunctive to gingivitis treatment and this would be future research interest.

8. References

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