A Clinical Evaluation of Dantaraksha (An Ayurvedic Tooth Powder) in the Management of Chronic Periodontitis

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Abstract

Chronic periodontitis is the inflammation of the periodontal tissue caused due to the accumulation of dental plaque. If untreated it will lead to progressive attachment loss, bone loss & ultimately tooth loss. It can be correlated to Dantavestaka in Ayurveda. Acharya Sushruta says it manifests due to Dusta Shonita (Vitiated blood). It has symptoms like bleeding gums, pus discharge & mobility in teeth. Conventional periodontal therapy consists of mechanical debridement that is scaling & root planning. Ayurvedic medication Dantaraksha – Tooth powder has been used as an adjunct in the management of chronic periodontitis to avoid the side effects of chemicals.

Objective: To evaluate the efficacy of Dantaraksha – Tooth powder, as an adjunct to scaling & root planning in Chronic Periodontitis patients.

Material and Methods: 40 patients selected for the study were equally divided in two groups: Group A – Only Scaling and Root planning, Group B – Scaling and root planning followed by application of Dantaraksha tooth powder to the gums & teeth, twice daily, and massaging the same on gums & teeth gently with finger. Plaque index, gingival bleeding index scores and probing pocket depth were evaluated at baseline & after one month of treatment.

Results: The results show statistically significant difference between Groups A vs B. By looking at the mean value of Group A & Group B it was found that Group B gingival index, plaque index & probing pocket depth was significant over Group A.

Conclusion: Dantaraksha powder is effective as an adjunct in the management of chronic periodontitis patients when compared to conventional scaling & root planning alone.

Keywords: Ayurvedic, Dantavestaka, Dantaraksha, Scaling & root planning, Chronic Periodontitis

Introduction

Chronic Periodontitis is the most advanced stage of gum/periodontal disease. It is “an infectious disease results in inflammation with in supporting tissues of the teeth, leading to progressive attachment loss and bone loss”. It can be correlated to Dantavestaka in Ayurveda. Acharya Sushruta says it manifests due to Dusta Shonita (Vitiated blood). It is mentioned in Dantamoola Rogas (Disease of Gums) under Mukha Rogas (Disease of Oral cavity). It has symptoms like bleeding gums, pus discharge & mobility in teeth. Advanced periodontal disease with deep periodontal pockets affects 10%–15% of adults worldwide[2] so it is very important to manage Periodontitis in the early stage. Else it leads to clinical attachment loss (CAL) and ultimately possible tooth loss.

Treatment of chronic periodontitis is largely based on the mechanical debridement of the tooth surface and meticulous maintenance of oral hygiene thereafter. Various

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chemical plaque control agents are used as adjuncts along with the mechanical plaque control methods for this treatment. Most of these chemical plaque control agents have varied side effects. This has led to the search of natural products which are highly effective in controlling chronic periodontitis. Dantaraksha is one such Herbal Tooth Powder which can manage chronic periodontitis.

Aims & Objectives of the Study

The aim of the clinical study was to evaluate the clinical effect of Dantaraksha - an Ayurvedic tooth powder on gingival inflammation, plaque reduction & probing pocket depth in subjects with chronic periodontitis.

Materials and Methods

Foutry patients (aged 20-60 years) with mild to moderate chronic periodontitis wererecruited for this randomized, controlled clinical trial from the Out Patient of Multi Speciality Ashwini Ayurvedic Clinic, No. 210/1, 4th Main Road, Chamrajpet, Bangalore - 560018. Written informed consent was obtained from all patients who were included in the study.

Inclusion and Exclusion Criteria

After taking a detailed medical history and initial clinical examination, systemically healthy individuals with following criteria were selected for the present study.

Inclusion Criteria

- Age group between 20-60 years
- Patients with chronic periodontitis having periodontal pocket depth between 4-6 mm
- Patients with a minimum of 20 teeth
- Patients having inflamed & spongy gums
- Patients who have not received any type of periodontal therapy for the past 6 months

Exclusion Criteria

- Patients suffering from any other systemic disease or with compromised immune system
- Patients taking any drug known to cause gingival enlargement
- Patients taking any immuno-suppressive drugs like corticosteroids
- Pregnant and/or lactating mothers
- Patients with any bleeding disorders
- Patients on anticoagulant therapy
- Patients with smoking and tobacco chewing habits
- Patients who were not willing to participate in the study

Study design

The total 40 patients who were diagnosed as mild to moderate chronic periodontitis were selected & divided into 2 groups, containing 20 patients each. In Group A – Only conventional procedure scaling and root planning was done. In Group B – Scaling and root planning followed by application of 2gm of Dantaraksha tooth powder to the gums & teeth, twice daily, and massaging the same on gums & teeth gently with finger. Gingival index, plaque index scores and probing pocket depth were evaluated at baseline & after one month of treatment.

Constituents of Dantaraksha

Each 10 gms of Dantaraksha contains following ingredients:

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Ingredients</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Triphala</td>
<td>1gm</td>
</tr>
<tr>
<td>2.</td>
<td>Gairika</td>
<td>1gm</td>
</tr>
<tr>
<td>3.</td>
<td>Bakula</td>
<td>2gm</td>
</tr>
<tr>
<td>4.</td>
<td>Babula</td>
<td>2gm</td>
</tr>
<tr>
<td>5.</td>
<td>ShudhaKasisa</td>
<td>250 mg</td>
</tr>
<tr>
<td>6.</td>
<td>ShudhaTutha</td>
<td>250 mg</td>
</tr>
<tr>
<td>7.</td>
<td>Khadirasara</td>
<td>1 gm</td>
</tr>
<tr>
<td>8.</td>
<td>Raktachandana</td>
<td>500 mg</td>
</tr>
<tr>
<td>9.</td>
<td>Ela</td>
<td>500 mg</td>
</tr>
<tr>
<td>10.</td>
<td>Nimba</td>
<td>1gm</td>
</tr>
<tr>
<td>11.</td>
<td>Karpooora</td>
<td>250 mg</td>
</tr>
<tr>
<td>12.</td>
<td>Saindhava</td>
<td>250 mg</td>
</tr>
</tbody>
</table>

Data Analysis

All the data was analyzed using the SPSS version 20.0 software. Inter-group and intra-group analysis was done by paired & unpaired Student t-test. A p-value ≤ 0.05 was considered to be statistically significant.

Results

A total of 40 patients were selected for the study who fulfilled the inclusion criteria and consented for the study. These patients were further divided into two groups. Group A – 20 patients & Group B – 20 patients. All 40 patients completed study, no patient showed any adverse reaction or discomfort.

The mean baseline gingival index scores were 2.20 (± 0.156) and 2.15 (± 0.167) for Groups A and B respectively. The mean baseline plaque index scores were 2.05 (± 0.185) and 2.05 (± 0.170) for Groups A and B respectively. Similarly, the mean baseline periodontal pocket depth scores were 2.80 (± 0.092) and 2.70 (± 0.105) for Groups A and B respectively (Table 1&2).

The gingival index scores reduced from 2.20 (± 0.156) to 1.45 (± 1.85) in Group A, 2.15 (± 0.167) to 0.60 (± 0.152) in Group B. The plaque index scores reduced from 2.05 (± 0.185) to 1.00 (± 0.192) in Group A, 2.05 (± 0.167) to 0.40 (± 0.134) in Group B and Similarly, the periodontal pocket depth scores reduced from 2.80 (± 0.092) to 2.75 (± 0.099) in Group A, 2.70 (± 0.105) to 2.40 (± 0.134) in Group B. (Table 1&2).

The results show statistically significant difference between Groups A vs B. By looking at the mean value of Group A
& Group B it was found that Group B gingival index was highly significant over Group A with p value 0.002. The mean plaque index scores and probing pocket depth reduced significantly during the entire duration of the study. The difference in the reduction of those scores was statistically significant among groups A vs B.

### Group A

#### Table 1

<table>
<thead>
<tr>
<th>Paired Samples Statistics</th>
<th>Mean</th>
<th>N</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pair 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gingival index before</td>
<td>2.20</td>
<td>20</td>
<td>.696</td>
<td>.156</td>
</tr>
<tr>
<td>treatment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gingival index after</td>
<td>1.45</td>
<td>20</td>
<td>.826</td>
<td>.185</td>
</tr>
<tr>
<td>treatment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pair 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plaque index before</td>
<td>2.05</td>
<td>20</td>
<td>.826</td>
<td>.185</td>
</tr>
<tr>
<td>treatment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plaque index after</td>
<td>1.00</td>
<td>20</td>
<td>.858</td>
<td>.192</td>
</tr>
<tr>
<td>treatment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pair 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Probing pocket depth</td>
<td>2.80</td>
<td>20</td>
<td>.410</td>
<td>.092</td>
</tr>
<tr>
<td>before treatment</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Probing pocket depth</td>
<td>2.75</td>
<td>20</td>
<td>.444</td>
<td>.099</td>
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<tr>
<td>after treatment</td>
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### Group B

#### Table 2

<table>
<thead>
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<th>Paired Samples Statistics</th>
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<th>N</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
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<tr>
<td>Pair 1</td>
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<td></td>
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<tr>
<td>Gingival index before</td>
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<td>20</td>
<td>.745</td>
<td>.167</td>
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<td>treatment</td>
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<tr>
<td>Gingival index after</td>
<td>.60</td>
<td>20</td>
<td>.681</td>
<td>.152</td>
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<tr>
<td>Pair 2</td>
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<td>Plaque index before</td>
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<tr>
<td>Plaque index after</td>
<td>.40</td>
<td>20</td>
<td>.598</td>
<td>.134</td>
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</tr>
<tr>
<td>Pair 3</td>
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<tr>
<td>Probing pocket depth</td>
<td>2.70</td>
<td>20</td>
<td>.470</td>
<td>.105</td>
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<tr>
<td>Probing pocket depth</td>
<td>2.40</td>
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<td>.598</td>
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<td>after treatment</td>
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</table>

### Group Statistics

#### Table 3 Group Statistics

<table>
<thead>
<tr>
<th></th>
<th>Group</th>
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<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
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<tr>
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<td>.598</td>
<td>.134</td>
</tr>
<tr>
<td>Probing pocket depth</td>
<td>Group A</td>
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<td>2.75</td>
<td>.444</td>
<td>.099</td>
</tr>
<tr>
<td>after treatment</td>
<td>Group B</td>
<td>20</td>
<td>2.40</td>
<td>.598</td>
<td>.134</td>
</tr>
</tbody>
</table>

Graph 1. Comparison of Mean scores of Gingival Index Between the experimental groups
Chronic Periodontitis is a common inflammatory disease characterised by destruction of the supporting structures of the teeth. It can be correlated to Dantavestaka in Ayurveda. Acharya Sushruta says it manifests due to Dusta Shonita (Vitiation of blood). It is mentioned in Dantamoola Rogas (Disease of Gums) under Mukha Rogas (Disease of Oral cavity). It has symptoms like bleeding gums, pus discharge & mobility in teeth. If not treated in time it will lead to untimely loss of teeth which will make multiple negative impacts on the quality of life. Hence management of chronic periodontitis is utmost important. There are so many Ayurvedic formulations mentioned in Ayurvedic classics for the management of chronic periodontitis. Dantaraksha is one such Ayurvedic Proprietary medicine formulated on the basis of classical text. It has an anti-inflammatory, antiseptic, antibacterial, astringent and healing action which helps in decreasing gingival index, plaque index and probing pocket depth.

Various herbs used in Dantaraksha are anti-plaque agent & antibacterial in action. Triphala was used in studies as antiplaque agent like Chlorhexidine and was more effective in inhibiting plaque formation with lesser or no side effects. Triphala has potent antioxidant and antimicrobial activity.
and inhibits the growth of *Streptococcus mutans* and gram-
positive cocci involved in plaque formation. Triphala kashaya
mouth wash is also very effective in Dental caries. [4]

Bakula Mimusops elengi Linn., is a well-known traditionally
used medicinal plant. It is reported to possess Astringent,
cooling, anthelmintic, tonic, and febrifuge. It is useful in
dental ailments like bleeding gums, pyorrhea, dental caries,
and loose teeth & it has antibacterial effect. [5] In Chinese
traditional medicine, the dried extract from the peeled
branches and stems of *A. catechu* provides *Er Cha*, which
has haemostatic activity (Stuart 1993).

Nimba (*Azadiracta indica*) its active constituents
possess insecticidal and insect repellent activity, like
22, 23-dihydronimocinol extracted from leaves, and
azadirachtin extracted from seeds.[6] *A. indica* fumes against
*Streptococcus pyogenes* after 10-minute exposure showed
100% inhibition and 50 % inhibition after 5-minute exposure,
it also showed inhibition of *S. aureus*, *S. epidermidis*, and *P.
aeruginosa* under same setting [7]. Camphor is antimicrobial,
topical analgesic, anti-itching, anti-cold, antiseptic.[8]

So having all the active ingredients, Dantaraksha tooth
powder caused decrease in gingival index, plaque index
and probing pocket depth. Whereas in the Group A after
scaling and root planning the mean gingival index score
came down from 2.20 to 1.45, in Group B after scaling
and root planning with regular 2 times Dantaraksha tooth
powder application & massage to gums & teeth the mean
gingival index came down from 2.15 to 0.6 after one month.
So the mean reduction of gingival index is highest in Group
A which is 1.55 when compared to Group B which is 0.75.

Group A after scaling and root planning the mean plaque
index score came down from 2.05 to 1.00, in Group B after
scaling and root planning with regular 2 times Dantaraksha
tooth powder application & massage to gums & teeth the mean
plaque index came down from 2.05 to 0.4 after one month.
So the mean reduction of plaque index is highest in Group
B which is 1.65 when compared to Group A which is 1.05.

Group A after scaling and root planning the mean probing
pocket depth score came down from 2.80 to 2.75, in Group
B after scaling and root planning with regular 2 times
Dantaraksha tooth powder application & massage to gums
& teeth the mean probing pocket depth came down from
2.70 to 2.40 after one month. So the mean reduction of
probing pocket depth is highest in Group B which is 0.30
when compared to Group A which is 0.05.

So, after this short term study with 20 patients in each group
and after one month of follow-up we got beneficial result
in favour of regular use of Dantaraksha tooth powder with
adjunct to scaling and root planing in patients with mild
to moderate periodontitis. No patients gave any history
of any pain or discomfort or side effects during this study

period. Long term studies with large sample size should
be done to definitely conclude about the beneficial effects
of Dantaraksha tooth powder.

**Conclusion**

This study has therefore evidently shown the effectiveness
of Dantaraksha tooth powder in the management of chronic
periodontitis when compared to conventional treatment
scaling & root planning alone. Hence Dantaraksha tooth
powder can be used as a safe adjunct in patients with
chronic periodontitis.

**Conflict of Interest:** None

**References**

1. Sushruta. Sushrutasamhita - with Nibandha sangraha
   Commentary of Dalhanaacharya and Nyayachandrika
   panjika of Gayadasa on nidana sthana. Edited by
   Yadavji TrikamjiAcharya, 6th ed. Varanasi: Choukhamba

2. Petersen PE, Ogawa H. Strengthening the prevention of
   periodontal disease: The WHO approach. J Periodontol
   2005; 76(12): 2187-93.

3. Nariya M, Shukla V, Jain S et al. Comparison of entero
   protective efficacy of triphala formulations (Indian
   Herbal Drug) on methotrexate-induced small ntestinal

   mouthwash on the caries status. *Int J Ayurveda Res

5. Bakula an Indian plant with interesting properties”


7. Prabhu N, Rengaramanujam J, Anna Joice P. Efficacy of
   plants -based holy stick fumigation against infectious
   bacteria. *Indian Journal of Traditional Knowledge

8. Liu CH, Mishra AK, Tan RX et al. Repellent and
   insecticidal effects of essential oils from Artemisia
   princeps and Cinnamomum camphora and their
   effect on seed germination of wheat and broad bean.

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