AYUSHDHARA
ISSN: 2393-9583 (P)/ 2393-9591 (O)
An International Journal of Research in AYUSH and Allied Systems

Case Study

A CASE REPORT ON THE EFFECT OF *TRIPHALA* DECOCTION IN TARTAR-INDUCED PERIODONTITIS IN DENTISTRY

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Article info

Article History:
Received: 03-07-2023
Revised: 28-07-2023
Accepted: 19-08-2023

KEYWORDS:
Triphala powder, Decoction, Tartar-induced periodontitis, Case report, Dentistry.

ABSTRACT

Dental tartar causes irritation and inflammation in gingival tissue. Further, it attacks the soft periodontal tissue which supports the teeth. Therefore, all supragingival and subgingival tartar was removed by an ultrasonic scaler on the 1st day, and the patient was advised to swish *Triphala* (equal amount of *Amla, Haritaki,* and *Vibhitaki*) decoction in the oral cavity from the evening on the same day of scaling. The lukewarm decoction was kept in the oral cavity for 10 minutes and then swallowed. It was given twice a day for 30 days after the meal. The patient was advised to visit on the 7th, 15th, and 30th day of follow-up. *Triphala* itself has an antimicrobial property. Its decoction kept in the oral cavity stimulated the saliva flow. Saliva has lysozymes that have a bactericidal effect on the oral micro-organisms. *Triphala* expelled the toxins from the gut by increasing the peristalsis movement of GIT. It had a digestive stimulant property which increased the digestive fire and improved overall oral health. As the *Triphala* decoction showed very effective results on scaling wound, it may be used as herbal mouthwash in the future. Besides, *Triphala* powder is easily available, economical, and has negligible side effects.

INTRODUCTION

Tartar develops from a plaque, a sticky substance formed regularly on teeth. Chronic exposure to the bacteria in plaque causes inflammation in the supportive tissues of teeth. Inflammation and degeneration of periodontal tissues i.e., gingiva, periodontal ligament, cementum, and alveolar bone are collectively called tartar-induced periodontitis.[1] The process of chronic periodontitis once established is self-perpetuating. The pockets cannot drain effectively and favor the proliferation of bacteria. Further destruction of the periodontal membrane and alveolar bone causes the pockets to deepen. The natural termination of the process is the loosening and exfoliation of the tooth.

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https://doi.org/10.47070/ayushdhara.v10i4.1308

Poor oral hygiene and snack habits (sticky and processed food) throughout the day allow the deposition of plaque/tartar on teeth. Not following proper methods to clean teeth in our daily routine can increase the risk of gingivitis and periodontitis. The plaque hardens into tartar within 48 hours and, if left untreated, can cause permanent damage to teeth. The bits of calcified tartar may break off and enter the digestive system and further into the patient's blood. [2]

The remarkable antibacterial activity and efficient pharmacokinetics effects of antibiotics have led to their extended use. However, excessive use of antibiotics in recent times has led to the emergence of bacterial resistance and another problem is tooth staining. Therefore, an urgent need is to find an alternative herbal drug with higher efficacy, negligible toxicity, and cost-effectiveness. Here, *Triphala* is a well-known powdered preparation in the Indian System of Medicine (ISM). It has gingival rejuvenation properties that bring the gumline back to near its original position. It has wound-healing properties along with its anti-gingival crevicular fluid (GCF). [3] Thus, the present study is focused on the critical

appraisal of *Triphala* decoction on scaling wound in tartar-induced periodontitis.

Case Report

Patient Information: A 40-year-old male patient with periodontal signs and symptoms of dental tartar for about 6 months came to the oro-dental OPD. His oral hygiene was poor. He had constipation and a gaseous abdomen for 2 months, taken drugs directly from the medical store but there was no relief. Besides, there was no history of past other illness.

Clinical Findings: The patient presented with complaints of yellowish deposits over teeth along with bleeding and swollen gums, the sensitivity of all teeth, pus showing up between the teeth and gumline when pressed, and a foul smell emitted from the oral cavity for about 6 months.

Timeline: The patient was registered after taking informed written consent. His participation in the study was for 30 days. After scaling on the 1st day, the patient was asked to visit on the 7th day, 15th day, and 30th day for the clinical assessment during the treatment period. The patient was advised not to take any antibiotics, NSAIDs, or oral contraceptives during the course of the study.

Diagnostic Assessment: The clinical parameters were assessed on tartar index, gingival index, sensitivity index, pocket depth, and halitosis index. [4] Clinical observations were evaluated on indexed tooth 16, 36, 11, and 31, 22, 44 as follow.

Table 1: Tartar Index (TI)- Greene and Vermilion

Grade 0	No calculus/ tartar present	Good
Grade 1	Supra-gingival calculus covering not more than one-third of exposed tooth surface	Mild
Grade 2	Supra-gingival calculus covering more than one-third but not more than two-thirds of exposed tooth surface or the presence of individual flecks of subgingival calculus around the cervical portion of the tooth or both	Moderate
Grade 3	Supra-gingival calculus covering more than two-thirds of the exposed tooth surface or a continuous heavy band of subgingival calculus around the cervical portion of the tooth, or both	Severe

Table 2: Gingival Index (GI)- Loe and Silness

Grade 0	Normal gingiva, no inflammation, no discoloration (erythema), no bleeding	Good
Grade 1	Mild inflammation, slight erythema, minimal superficial alterations, no bleeding	Mild
Grade 2	Moderate inflammation and erythema, bleeding on probing	Moderate
Grade 3	Severe inflammation, severe erythema and swelling, tendency to spontaneous bleeding, possible ulceration	Severe

Table 3: Sensitivity Index (SI)

Grade 0	Subject does not respond to air stimulus	Good
Grade 1	Subject responds to air stimulus but does not request discontinuation of stimulus	Mild
Grade 2	Subject responds to air stimulus and requests discontinuation or moves from stimulus	Moderate
Grade 3	Subject responds to the air stimulus, considers stimulus to be painful and requests discontinuation of the stimulus	Severe

Table 4: Pocket Depth (PD)

Grade 0	1-3 mm below the gum tissue	Good
Grade 1	3-5mm below the gum tissue	Mild
Grade 2	5-7mm below the gum tissue	Moderate
Grade 3	>7mm below the gum tissue	Severe

Table 5: Halitosis Index (HI)- Rosenberg

Grade 0	Absence of odor	Good
Grade 1	Odor is detectable, although examiner could not recognize it as malodor	Mild
Grade 2	Malodor is detected but can be tolerated by examiner	Moderate
Grade 3	Overwhelming malodor is detected and cannot be tolerated by examiner (examiner instinctively averts the nose)	Severe

Therapeutic Interventions

Scaling of teeth followed by swishing and swallowing *Triphala* decoction were the two main procedures of the study. The *Triphala* decoction was swished in the oral cavity for 10 minutes and then

swallowed twice daily for 30 days after the meal. The patient was observed via clinical parameters before and after scaling by an ultrasonic scaler on the 1st day. The patient was asked to visit on the 7th day, 15th day, and 30th day during the period of treatment for clinical improvement. *Triphala* consists of equal parts of the dried fruit of *Amla (Emblica officinalis), Haritaki (Terminalia chebula),* and *Vibhitaki (Terminalia belerica)*. After cleaning the dried fruits and removing the seeds, the powder was made separately from the three dried fruits. Three powders were mixed in equal amounts to form a uniform mixture which was used to prepare a fresh decoction by the patient. The slightly warm decoction was used for swishing around the oral cavity at the earliest after its preparation and then swallowing it after 10 minutes. 5 grams of this mixture was added to 1 glass of water and then boiled to ½ glass of water remaining. The decoction was filtered through a fine sieve and stored in a clean bowl for immediate use.

Follow-up and outcomes

After scaling teeth, *Triphala* decoction was swished in the oral cavity for the assessment of drug efficacy. The primary outcome was very promising on scaling wound in dental tartar. *Triphala* decoction swishing showed a very effective result on the gingival reattachment to the tooth [Table 6]. The clinical parameters were observed on the 7th, 15th, and 30th day during the treatment period, and the result was assessed at the end of study on the 30th day of follow-up. All the clinical parameters were marked improved to grade 0 [Table 1, 2, 3, 4, 5] on the 3rd day, 7th day, and 15th day under the follow-up.

Table 6: During the period of treatment

Clinical Parameters	During the period of treatment				
	Before scaling	After scaling			
	Day 0	Day 1	Day 7	Day 15	Day 30
Tartar Index (TI)	2	0	0	0	0
Gingival Index (GI)	2	1	0	0	0
Sensitivity Index (SI)	2	1	0	0	0
Pocket Depth (PD)	2	1	0	0	0
Halitosis Index (HI)	2	1	0	0	0

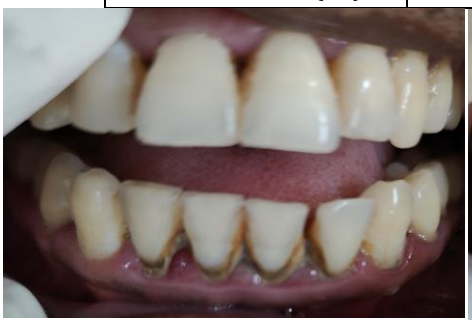

Figure 1: Dental tartar deposits before scaling of teeth on 1st day

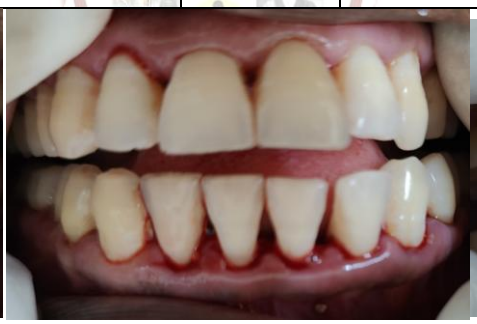

Figure 2: Gingival wound formed after scaling of teeth on 1st day

Figure 3- Gingival modulation effect of *Triphala* decoction on 30th day

DISCUSSION

The periodontal tissues, supporting structures of teeth, are destroyed by the irritants in plaque. The gingiva pulled away from teeth and a small pocket formed between teeth and gums. These pockets become filled with dental plaque and tartar [Figure 1]. As the pockets deepen, it becomes impossible to clean tartar by tooth brushing and always needs scaling of teeth by an ultrasonic scaler for its purificatory effect. [5] The gingival margins are abraded and a wound is formed around the tooth after the scaling teeth [Figure 2]. Therefore, the swishing of *Triphala* decoction in the oral cavity was done for its pharmacological effect. It helped to prevent the build-up of bacteria and plaque. This, in turn, reduced further gum inflammation and gum recession. Therefore, tooth length was reduced to its normal position and the gingival reattachment was done by its gingival modulatory effect [Figure 3].

Antimicrobial action of *Triphala*

Triphala has tannins and quinones, having antimicrobial action on *E. coli, Proteus mirabilis, Pseudomonas aeruginosa,* and *Klebsiella pneumonia*. Flavones, flavonoids, and flavanols inhibit *Vibrio cholera, Shigella, Clostridium, Streptococcus mutansin*. The gallic acid in *Triphala* suppressed the growth of

cancer cells. In *Amalaki*, there are 478.56mg/100ml Vitamin C which helped in speed up the healing process. *Triphala* kept the oral tissue's structure intact and elastic due to its anti-collagenase activity. The extract of *T. chebula* has anti–caries activity. The extract of *T. belerica* has anti-oxidant properties that scavenge the free radicals from the oral tissue.[6] Swishing *Triphala* decoction draws toxins from the oral cavity by pressure and exerts its specific action (cleansing and healing action) simultaneously. IgA of saliva is active in immunological defence against bacteria and viruses when the drug *Triphala* decoction is kept in the mouth for 10 minutes.[7] Saliva exerts a major influence on scaling wound by mechanically cleansing the exposed oral surfaces, buffering acids produced by bacteria, and controlling bacterial activity in the oral cavity.[8] There is a connection between the oral microbiome and digestive health. The action of *Triphala* decoction is a miracle on GIT when it is swallowed along with saliva. Saliva has several digestive enzymes like Ptyalin or salivary α-amylase; lysozymes (bactericidal); kallikrein, a proteolytic enzyme; lingual lipase, a lipolytic enzyme. *Triphala* increases the peristalsis movement and expels the toxin from the gut. Thus, it increases the digestive fire and overall improvement of oral health.[9] The rationale behind *Triphala* decoction swish (gingival physiotherapy) is the fact that mechanical stimulation of gingival cleansing plays an important role in increasing gingival tone, surface keratinization, gingival vascularity, and gingival circulation.[10]

CONCLUSION

Triphala is a novel drug with an array of therapeutic activities on the different dimensions of oral health. The lukewarm decoction of *Triphala*, by its antimicrobial effect, provided a barrier to prevent infection and plaque deposition, which in turn restored the healthy clinical gingival attachment level at the gum line. The swishing *Triphala* decoction on scaling wound is a better principal line of treatment in the successful management of tartar-induced periodontitis. However, it should be further studied in the future on a large number of patients to see the same effect of the drug.

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Cite this article as:
Mridulata Maurya, Akshata Nara, Dinesh Kumar Maurya, Tarun Kumar Dwibedi. A Case Report on the Effect of Triphala Decoction in Tartar-Induced Periodontitis in Dentistry. AYUSHDHARA, 2023;10(4):22-25.
https://doi.org/10.47070/ayushdhara.v10i4.1308
Source of support: Nil, Conflict of interest: None Declared

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