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ORIGINAL RESEARCH ARTICLE – CLINICAL RESEARCH **OPEN ACCESS**

EFFICACY OF *TILA TAILA GANDOOSHA DHARANA* IN GINGIVITIS

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ABSTRACT:

Background*:* Gingivitis (inflammation of Gingiva) is the most common disease of gingiva. The inflammation caused by dental plaque give rise to associated degenerative, necrotic and proliferative changes in the gingival tissues. Gingivitis often presents with gum bleeding which is highly disturbing for the patients. *Gandoosha dharana* is a procedure in which medicine is kept inside the oral cavity without moving.Seasame oil is easily available and cheap. In therapeutics it is used as a base for medicated oil and as an ingredient in many compound medical preparations. Considering the disease senerio, drawback of existing treatment modalities in modern medicine classical references about the drug and its cost effectiveness, the present work was taken up so as to contribute towards the dental health care of the community. **Objective**: To clinically evaluate the effect of *Tila taila* (Sesame oil) when used as *Gandoosha dharana* in reducing bleeding, calculus and improving general condition of gingiva in Gingivitis. **Materials and Method:** 44 patients attending the opd of DGV Government Ayurveda College diagnosed as gingivitis were selected. Gandoosha dharana was administered for 10 days with 7 days follow up assessment. **Result**: Patients showed statistically significant improvement in parameters (gingival index, bleeding index and calculus index). **Conclusion**: Tila thaila gandhoosha dharana is effective in reducing gingivitis. This can be propagated as safe and cost effective treatment for gingivitis.

Key words: *Tila thaila, Gandoosha*, Gingivitis.

INTRODUCTION:

Gandoosha dharana is a procedure in which medicine is kept inside the oral cavity without moving. Even though *Gandoosha dharana* with Sesame oil is advised in *Dinacharya*, for obscure reasons it not practiced commonly today. As a result the teeth and gingivae are missing a maintenance activity with a rich nutritional and antimicrobial agent. Propagation of simple, harmless, and effective remedies is the need of the hour, as side effects overweigh effects in many therapies. *Tila* is the first one among Plant sources of oils (*Sthavara sneha yoni*)[1].*Tila taila* is in use as a cooking medium and hair oil in houses. In therapeutics, it is used as a base for medicated oils and as an ingredient in many compound medicinal preparations. Gingivitis (Inflammation of the gingiva) is the most common disease of the gingiva. The inflammation caused by dental plaque gives rise to associated degenerative, necrotic and proliferative changes in the gingival tissues.[2] Gingivitis often presents with gum bleeding which is highly disturbing for the patient. It is mandatory to develop and propagate a harmless and cost effective remedy for this condition. In Ashtanga hridaya[3] and Caraka Samhita[4]- two ancient Indian classical health care literatures, use of Sesame oil (*Tila taila*) as *Gandoosha dharana* is advised as a part of routine dental hygiene. Sesame oil is easily available & cheap. Considering the disease scenario, drawbacks of existing treatment modalities in modern medicine, classical references about the drug and its cost effectiveness, the present work was taken up so as to contribute towards the dental health care of the community.

Objective: To clinically evaluate the effect of *Tila taila* (Sesame oil) when used as *Gandoosha dharana* in reducing bleeding, calculus and improving general condition of gingiva in Gingivitis.

Subjects and Methods:

Ethical considerations

Clearance was obtained from the Institutional Ethical Committee and written consent was obtained from each and every patient before enrolling in the trial.

Sample

Study type : open clinical trial

Sample size : 44

Randomization technique : simple randomization

Patients attending the Out Patient Department of Dravyagunavijnan, who were diagnosed as gingivitis cases as per diagnostic criteria (Bleeding index and Gingival index) coming under the inclusion criteria were enrolled in the trial. Total 44 patients registered. There were 4 drop outs. 40

patients completed the treatment and follow up schedule.

Inclusion criteria:

1. Age- 11- 60 years
2. Patients having clinical features of gingivitis –

    Swollen or puffy gums

    Dusky red or dark red gums.

    Gums that bleed easily when you brush or floss.

    Bad breath.

    Receding gums.

    Tender gums.

Exclusion criteria:

Xerostomia

Scleroderma

Neurological diseases

Mental retardation

Chronic renal failure

HIV infection

Unwilling patients

Dose determination

Dose was decided separately for all individuals by measuring the oral volume with the help of water and a measuring jar. Patients were asked to hold the maximum amount of water in mouth. They were asked to spit into the measuring jar and the quantity was measured. The quantity to fill half volume of mouth was given for Gandoosha[5].

Duration of treatment

10 days treatment and seven days follow up

Duration of Procedure : Till the achievement of *Samyak lakshana.*

Assessment criteria

Assessment scores regarding Bleeding index, Calculus index and Gingival index were recorded each time (before treatment,after 10 days treatment and after seven days follow up in the assessment sheet of case sheet proforma.

Instruments

Mouth mirror and Gingival probe were used for examination.

Definition of indices used as assessment criteria

Bleeding index

0- No bleeding

Bleeding results after probe is placed in gingival sulcus upto 2 mm drawn along the inner surface of gingival sulcus.

Gingival index

0- Normal gingival appearance

1- Mild inflammation, slight change in colour, slight oedema, no bleeding on palpation.

2- Moderate inflammation, redness, oedema and glazing; bleeding on probing

3- Severe inflammation, marked redness and oedema, ulcerations, tendency to

bleed spontaneously.[6]

(**Probing**- Periodontal probe is drawn horizontally along the soft tissue wall of the entrance to the gingival sulcus

Calculus index

0- Calculus is absent

1- Supragingival (calculus located on the exposed crown and root extending to 1mm below the free gingival margin) calculus, but no subgingival calculus.

2- Supragingival and subgingival calculus or sub gingival calculus

Diagnostic criteria

Bleeding index = 1,

Gingival index > 0

Treatment schedule and assessment

All the patients were assessed with the help of assessment criteria before treatment and were given *Gandoosha dharana* with *Tila taila* (Sesame oil) to be retained till mouth gets filled with *kapha* twice daily (Early morning after brushing teeth and just before sleeping at night for ten days in *uttama matra* (quantity to fill half of the oral cavity).[1 Assessment was done after treatment and after seven days follow up.

Bleeding Index

Image no 1 **Before treatment** ***Image no 2*** **After treatment**

Table No:1Bleeding Index

Bleeding index	Before treatment		After treatment		After follow up	
	N	%	N	%	N	%
No bleeding on probing	1	2.5	37	92.5	38	95
Bleeds on probing	39	97.5	3	7.5	2	5
Total	40	100	40	100	40	100

Table No:2 Analysis of Bleeding index before and after treatment

Bleeding index		After treatment		Total
		No bleeding on probing	Bleeds on probing	
Before treatment	No bleeding on probing	1	0	1
	Bleeds on probing	36	3	39
	Total	37	3	40

(McNemar test p value = 0.001)

Analysis of values of Bleeding index before and after treatment shows that the test is significant with p value 0.001. This shows significant improvement in bleeding of gums after treatment.

Table No : 3 Analysis of Bleeding index Before treatment and After follow up

Bleeding index		After Follow up		Total
		No bleeding on probing	Bleeds on probing	
Before treatment	No bleeding on probing	1	0	1
	Bleeds on probing	37	2	39
	Total	38	2	40

(McNemar test p value = 0.001)

Analysis of values of bleeding index before treatment and after follow up shows that McNemar test is significant at p value 0.001. Thus the obtained improvement is retained till the end of follow up period.

Calculus index

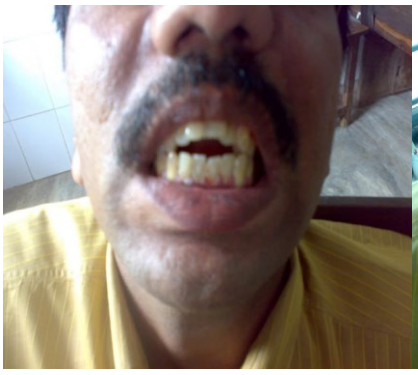

Image No: 3 Before treatment

Image No: 4 After treatment

Table No :4 Distribution of Calculus index Before treatment, After treatment and After follow up

Calculus index	Before treatment		After treatment		After follow up	
	N	%	N	%	N	%
No calculus	13	32.5	28	70	32	80
Supra gingival calculus	19	47.5	12	30	8	20
Supra and sub gingival calculus	8	20	0	0		0
Total	40	100	40	100	40	100

Table No ;5 CALCULUS INDEX AFTER TREATMENT

		After treatment		
Calculus index		0	1	Total
Before treatment	0	13		13
	1	12	7	19
	2	3	5	8
	Grand Total	28	12	40

(McNemar test p value = 0.001)

Before treatment 3 patients (7.5%) had supra gingival and sub gingival calculus which became 0% after treatment. 12 patients out of 40 had (30%) had supra gingival calculus alone before treatment which reduced to 7patients(17.5%) after treatment. This shows effectiveness of the treatment in calculus also. In order to analyze the values using McNemar test the values 1 and 2 were clubbed together and taken as 1and the following table was constructed.

Table no: 6 calculus index after follow up

		After Follow up		
Calculus index		0	1	Total
Before treatment	0	13		13
	1	14	5	19

	2	5	3	8
	Grand Total	32	8	40

Table No :7Analysis of Calculus index Before treatment and After follow up

Calculus index		After follow up		Total
		0	1	
Bfore treatment	0	13		13
	1	19	8	27
	Total	32	8	40

McNemar test p value = 0.001

Analysis of values of calculus index before treatment and after follow up using McNemar test gave p value 0.001.This shows that the test is significant at p=0.001. So the difference in values of Calculus index before treatment and after follow up is statistically significant

Gingival index

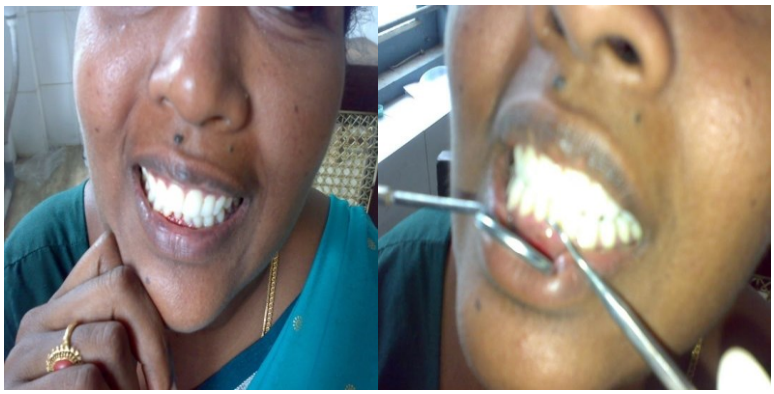

Image No : 5 Before Treatment **Image No : 6** After Treatment

Table No:8 Distribution of Gingival index before and after treatment

Gingival index	Before treatment		After treatment		After follow up	
	N	%	N	%	N	%
Normal gingiva	1	2.5	25	62.5	32	80
Mild inflammation	18	45	14	35	7	17.5
Medium inflammation	18	45	1	2.5	1	2.5
Severe inflammation	3	7.5		0		0
Total	40	100	40	100	40	100

Table No:9 Analysis of Gingival index Before treatment and After treatment

Gingival index		After treatment			Total
		0	1	2	
Before treatment	.00	1	0	0	1
	1.00	16	2	0	18
	2.00	8	12	1	21
Total		25	14	1	40

(McNemar test p value = 0.001)

On analyzing the values of gingival index before and after treatment using Mcnemar test , the difference was found significant at p=0.001 level. This shows that there was statistically significant improvement in Gingival index after treatment.

Table No : 10 Analysis of Gingival index Before treatment and After Follow up

Gingival index		After Follow up			Total
		0	1	2	
Before treatment	.00	1	0	0	1
	1.00	17	1	0	18
	2.00	14	6	1	21
Total		32	7	1	40

(McNemar test p value = 0.001)

Analysis of values of gingival index before treatment and after follow up using McNemar test showed significance at p=0.001.This shows that the difference in gingival index before treatment and after follow up is statistically significant.Hence the improvement obtained was retained in the follow up period also.

DISCUSSION:

Sesame oil (*Tila taila*) holds the status of a harmless and effective product popular in food and medicinal industry. Such cost effective products with genuine classical indications need to be propagated with the back ground of clinical data in order to fulfil the need for evidence based medicine. As a step forward in reverse pharmacological approach, this work was taken up. Points like use of Krishna *Tila* as *Rasayana* (rejuvenation) to strengthen teeth and use of *Tila* in the preparation of *Gandhataila*, used in fracture of bones suggest that *Tila* has special affinity to *Asthi dhatu* (Bone tissue) and hence *dantha (*teeth) which is the *upadhatu* of *Asthi*. On the other hand, *Taila* is the drug of choice in *Vata vikaras* and *Asthi* is the abode of *Vata*. These facts substantiate the specific effect of *Tilataila* in strengthening teeth. *Tila taila* is the

best among *sneha dravya*. The drug possesses *Ushna veerya* and *Madhura vipaka*. *Vata Kapha* alleviation is the major action on *Doshas*. It is mentioned as *Raktapittajit* in *Madanapala nighantu*. *Taila* specifically possesses wound healing (*Vrana hara*) and antimicrobial (*Krimighna*) properties. Both these are necessary in the management of Gingivitis. Sesame oil possesses positive optical rotation which is unusual in an oil devoid of optically active fatty acid glycerides. Minor constituents present in the unsaponifiable matter such as Sesamin, Sesamolin and Phytosterol are responsible for the optical rotation. It acts synergistically with insecticides due to the presence of Sesamin and Sesamolin. These may impart *Krimighna* property. A phenolic antioxidant Sesamol is present in traces. It also possesses a high degree of resistance towards oxidative rancidity. This may be the reason for using it as base for most of the *taila* preparations and liniments for external use. Phenolic antioxidant Sesamol also may support revival of tissues preventing oxidative reaction and aging. In general *Mukha roga* is caused predominantly by *Kapha* vitiation. Gingival bleeding is the outcome of inflammation but provoked by instant vata vitiation initiating outward movement of vitiated *rakta*. So pacification of *Vata* is a mandatory step in arresting bleeding. The drug, *Tila taila* (Sesame oil) by nature is the best among *Vata hara* drugs. Its *teekshnatwa*, *ushna veerya* and *kashaya rasa* also makes it *Kaphahara*.In classical texts, Sesame oil is advised for daily use for *Gandoosha dharana* as a part of *Dinacharya.* When patients discontinued the treatment for one week and during follow up assessment, it was noticed that the result was reduced compared to the period under treatment though the difference in values after treatment and follow-up was not statistically significant. This emphasizes the classical point that Sesame oil should ideally be used daily for *Gandoosha dharana* as a part of routine dental hygiene. Oil was extracted using traditional wooden mortar which retains the flavour of oil, oil with good flavour and aroma is ideal for retention in mouth because it is essential to have psychological compliance for therapies like *Gandoosha* as it needs to be retained inside the mouth with patient's self-control. Also flavour and aroma impart freshness to mouth. Marked reduction was noticed in calculus along with shiny appearance of teeth indicating the *kshalana* (cleansing) action of the product of chemical reaction between Sesame oil and saliva. From the clinical features of Gingivitis, like increased gingival crevicular fluid production and bleeding on probing *kapha pitta* involvement

is evident, since there is engorgement of blood vessels and impairment of venous return in later stages of pathogenesis, involvement of *vata* is inevitable. This give points to state *Tridosha* involvement in the disease pathology. Considering *Rasa, Madhura* and *Tikta rasa* are expressed first followed by *Kashaya anurasa. Madhura rasa* has *sarva dhatu vivardhana* and *sthairyakara* properties.[7] *Madhura rasa* is condusive for hair *(keshya)* which is an *upadhatu* of *Majja* according to Sarngadhara[8]. Nourishment for *Majja* is obtained from the essence of *Asthi dhatu*. So it can be assumed that the drugs possessing *Madhura rasa* has special affinity to *Asthi* and *Majja dhatu,* on the other hand *Danta* or tooth is another *upadhatu* of *Asthi,* a drug having *brimhana* action on *Asthi* will in turn cause *brimhana* action on *Danta* also. *Tikta rasa* of the drug imparts *krimighna, kleda hara, sleshmapitta upashoshana* properties to the drug. These enhance healing of infected and inflamed gingivae, *kledaharatwa* and *upashoshana* control excessive flow of gingival crevicular fluid. Considering *Guna, Teekshna, Vyavayi, Vikashi* and *Sookshma* gunas help the active principles of the drug to spread fast and penetrate subtle channels (*sookshma srotas*) for enhanced local action. *Sara guna* makes its easy access to periodontium by free-flowing nature. *Guru guna* imparts nourishing effect to local tissues like Gingivae and teeth and is also *vata hara*. *Vishada guna* imparts cleansing effect and so aid removal of calculus debris. Regarding *Veerya Tila taila* has *ushna veerya* which is *Kaphavata hara*. It is *sheeta sparsha* according to Bhava prakasha and Sankara nighantu which implies it will not aggravate *pitta* by local application.*Tila taila* acts as nourishing in lean and depleting in obese persons which sounds controversial. This is explicable as the drug has cleansing effect on channels (*Sroto shodhana* action) which is essential for proper nutrition and healthy maintenance of tissues. This property is certain to play a role in correcting tissue destruction resuting from chronic inflammation. The basic pathology of Gingivitis starts from plaque accumulation which is followed by bacterial infestation resulting in inflammation and bleeding of gums. *Tila taila* cleanses the teeth and periodontium thus preventing accumulation of plaque, thus cutting the pathogenesis at root. On the other hand, its srotho shodhana property helps in regaining blood circulation and thus prevents gingival anoxemia. Since *Tila taila* is a good source of vitamin E and phenolic antioxidant Sesamol which bring about tissue rejuvenation. Sesamin and Sesamolin which make the oil act in synergy with insecticides might have antibacterial action which needs

detailed investigation for final statement at the same time classical references support this fact by stating *Tila taila* to be *krimighna.* In the process of pathogenesis there is vitiation of *Vata* by *srotorodha* which results in *pratiloma gati* (Abnormal movement) leading to bleeding. *Tila taila* is the best *Vata hara* drug and mitigates *vata.* Here by breaking the pathology at various levels *Tila taila* prevents and controls inflammation and in turn bleeding. Saponification and emulsification may have a vital role in plaque removal and hence reduction in calculus index.Considering Gingival index, it is the sum total measure of health of Gingiva based on overall level of inflammation, appearance and bleeding.The efficacy of *Tila taila* in improving general condition of the Gingiva by various mechanisms was evident from the result obtained. The mode of action includes complex mechanisms like plaque removal and cleansing by saponification, controlling bleeding by *vata anulomana*, controlling exudation by *kaphaharatwa.* All together Tila taila acts at all stages from the beginning to end of pathogenesis of Gingivitis.

CONCLUSION

Tila taila Gandoosha Dharana is effective in reducing bleeding in Gingivitis also reduces calculus associated with Gingivitis and improves general condition of the Gingiva in Gingivitis. Tila taila Gandoosha Dharana can be utilized as a safe and cost effective remedy for Gingivitis.

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