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Assessment of efficacy of *Kankshi Bhasma Dhantadhavana* in extrinsic dental stain an observational study

Manjula Turamari[1], Kshitija Tigale[2]

[1]Assistant Professor, SNVV'S SGV Ayurvedic Medical College, Hospital and Research Centre, Bailhongal, Karnataka, India.

[2]Fourth Year BAMS Student, SNVV'S SGV Ayurvedic Medical College, Hospital and Research Centre, Bailhongal, Karnataka, India.

ABSTRACT

Chewing tobacco and use of SLT (smokeless tobacco) products cause considerable staining of teeth among users. Discolouration of the teeth is a common complication of tobacco chewing. The stains bind and penetrate the enamel, dentin, root surfaces causing a brown to black discolouration. Tobacco stains cause the enamel to wear away over time. This exposes the dentin (a softer layer of teeth underneath the enamel), which starts to show through, teeth will look increasingly more yellow. These stains can also lead to gum diseases. Artificial dentures, prosthesis is also discoloured by prolonged tobacco chewing. The coarse abrasives in tobacco products when constantly chewed cause abrasion or tooth wear. Chewing tobacco also increases the incidence of dental caries and thereby causes tooth loss. Epidemiology suggests tobacco users have 67 per cent tooth loss compared to non-users. The high content of sweetening and flavouring agents in tobacco products is responsible for tooth decay. To overcome this *Kankshi Bhasma Dantadhavan* can be an efficient way *Kankshi* (Potash alum [K_2SO_4, $Al_2(SO_4)3.24H_2O$] having antiseptic and antibacterial properties along with that *Vruna Ropana*, *Lekhana, Mukha Rogahara, Dantadadryakara. Danta Paichilyahara*, *Dantasharkarahara Karma*. It is the high time to intervene Ayurveda as remedy in dental stains specific to tobacco chewing.

Key words: *Dental stain, Kankshi Bhasma, Dantadhavan, Dantasharkarahara.*

INTRODUCTION

What can be something that is attractive in a person? Yes, it can be smile and the talk. Wherein, in the world of interaction and communication the oral hygiene is of great impact. Oral cavity being the portal for GIT entrance affects quality of life depending on individual life style. Hence oral unhygienic can be major turn off in society and disturbing appearance too.

Irrespective of socio-economic conditions, sex, illiteracy, occupation and age, people have habituated tobacco consumption on daily basis by many means like chewing, smoking etc. India is second highest consumer of tobacco, has one of the highest rates of tobacco related morbidity and mortality in the world. 25.9% of adults use tobacco, including 32.9% of males and 18.4% of females.

Habits like, *Gutaka*/tobacco chewing, drinking tea and coffee leads to many oral aliments including oral cancer, fibrosis, loss of periodontal support and dental staining. Stain on teeth are of two types, extrinsic and intrinsic. Extrinsic stain is superficial type of discoloration that affects enamel. Intrinsic stain doesn't have any treatment in modern science and for extrinsic stains will not respond to regular brushing as these stains are deeply situated, and only management way is professional scaling and polishing or else aesthetic correction (veneers, crowns).

To overcome this entire cosmetic including oral health issues it's better to go for Ayurvedic management by *Kankshi Bhasma. Kankshi* (Potash alum) having antiseptic and antibacterial properties along with *Vruna Ropana, Lekhana, Mukha Rogahara, Dantadadryakara, Danta Paichilyahara, Dantasharkarahara Karma*. It is the high time to

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intervene Ayurveda as remedy in dental stains specific to tobacco chewing.

AIMS AND OBJECTIVES

1. To study in detail about the *Kankshi Bhasma.*

2. To study about Dental stain.

3. To know the effect of *Kankshi Bhasma* on tooth staining due to tobacco chewing.

MATERIALS AND METHODS

Type of study: Observational study

Drug source

1. Collection of *Kankshi* from GMP certified pharmacy.

2. Preparation of *Kankshi Bhasma*.

Clinical source

The patients attending OPD/IPD of SNVV'S, SGV Ayurvedic college, Hospital and Research Centre, Dental Department.

Method of collection of data

It's a single blind clinical study, patients of dental stain selected are included in a single group, and the results are recorded as per the proforma designed for the study.

Parameters of signs and symptoms were scored on the basis of standard method of grading. The obtained data was subjected to suitable statistical analysis.

Selection of patients

Sample size - 15

Duration of study - 30 days.

Inclusion criteria

a) Age group of 20-60 years.

b) The signs and symptoms of extrinsic dental stain, which is manifested due to gutaka/tobacco chewing are taken for study.

Exclusion criteria

a) Patient with age group below 20 year and above 60 years.

b) The patient suffering from any other systemic illness like cancer, Tuberculosis, Herpes simplex, cardiac disease, HIV etc.

Administration of drug

▪ Dose as required quantity of individual patients

▪ Duration and Time: *Kankshi Bhasma* is given for *Danta Dhavana* (rubbing with fingers for 2 minutes) early morning and before bed.

Grading for assessing parameters

▪ **Grade 0 -** Stains absent

▪ **Grade 1 -** stains involving only proximal surface without involving labial or lingual surface

▪ **Grade 2 -** stains covering up to half of the labial or lingual crown surface, with or without involvement of proximal surface.

▪ **Grade 3 -** stain covering more than half of labial or lingual crown surface, with or without involvement of proximal surface.

RESULT

The clinical trial was conducted on 15 patients of tobacco stain fulfilling the inclusive criteria. The patients were randomly selected. The subjective and objective parameters of patients were noted before the treatment and after treatment, for statistical analysis Wilcoxon matched pairs test was applied to all the parameters. The results of *Kankshi Bhasma* over tobacco stains are presented here.

1. Effect of *Kankshi Bhasma* on stains

The above table shows the effect of use of *Kankshi Bhasma Dantadhavan* in Grade 1, 2 and 3 respectively, the patients having extrinsic stains with grade 1 had an improvement, which reduced to grade 0 and grade 2 reduced to grade 1, significant improvement was observed in these patients.

There is no significant improvement in grade 3.

The mean score of patients before treatment was 2.2 and it reduced to 1.1 after treatment, showing overall improvement of 48.8% on overall study.

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The reduction of staining in patients with grade 1 and grade 2 was significant.

2. Status of frequency of tobacco chewing

The above table (1.1 and 1.2) shows status of frequency of tobacco chewing before and after treatment.

The mean score before the treatment was 3.0 and it reduced to 2.0 after treatment. The significant improvement in reduction of stain was seen in the patients with reduced frequency of tobacco chewing as compared with those continued it.

3. Status of quantity of tobacco and gutka chewing

Quantity of tobacco chewing in patients was reduced by 25% and those in gutka chewing was reduced by 37.93 %.

The mean score of tobacco chewing patients before treatment was 3.3 and that of gutka chewing patients was 3.2 which reduced to 2.5 and 2.0 respectively in both the groups.

4. Status of Gingivitis

Gingivitis was reduced by 100%, the mean score before treatment was 1.0 which reduced to 0 after treatment. It shows significant improvement in gingivitis.

Table 1: Comparison of before and after treatment with grades of Tobacco staining

Tobacco staining	Before treatment	%	After treatment	%
Grade 0	0	0.00	2	13.33
Grade 1	2	13.33	9	60.00
Grade 2	8	53.33	4	26.67
Grade 3	5	33.33	0	0.00
Total	15	100.00	15	100.00

Table 2: Comparison of before and after treatment with grades of Tobacco staining by Wilcoxon matched pairs test.

Treatment	Mean	Median	IQR	% of change	Z-value	p-value
Before treatment	2.2	2.0	1.0			
After treatment	1.1	1.0	1.0	48.48	3.4078	0.0007*

*p<0.05

Figure 1: Comparison of before and after treatment with grades of Tobacco staining
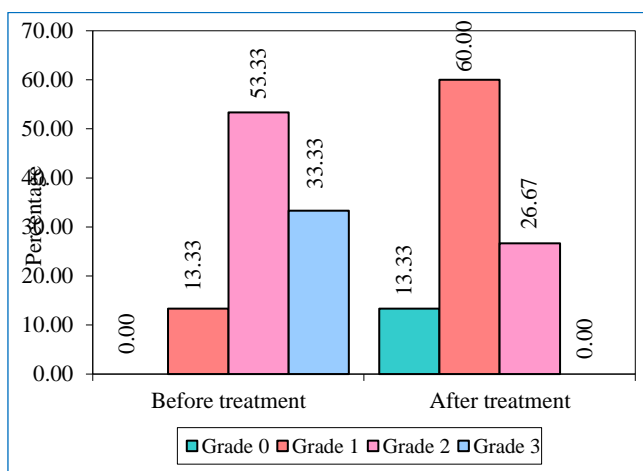

Table 3: Comparison of before and after treatment with status of Frequency of tobacco chewing / Day

Frequency of tobacco chewing	Before treatment	%	After treatment	%
1 to 5 times	2	13.33	4	26.67
6 to 10 times	3	20.00	6	40.00
11 to 15 times	3	20.00	4	26.67
16 to 20 times	7	46.67	1	6.67
Total	15	100.00	15	100.00

Table 4: Comparison of before and after treatment with status Frequency of tobacco chewing /Day by Wilcoxon matched pairs test.

Treatment	Mean	Median	IQR	% of change	Z-value	p-value
Before treatment	3.0	3.0	2.0			
After treatment	2.1	2.0	2.0	28.89	2.8031	0.0051*

*p<0.05

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Figure 2: Comparison of before and after treatment with status of Frequency of tobacco chewing /Day
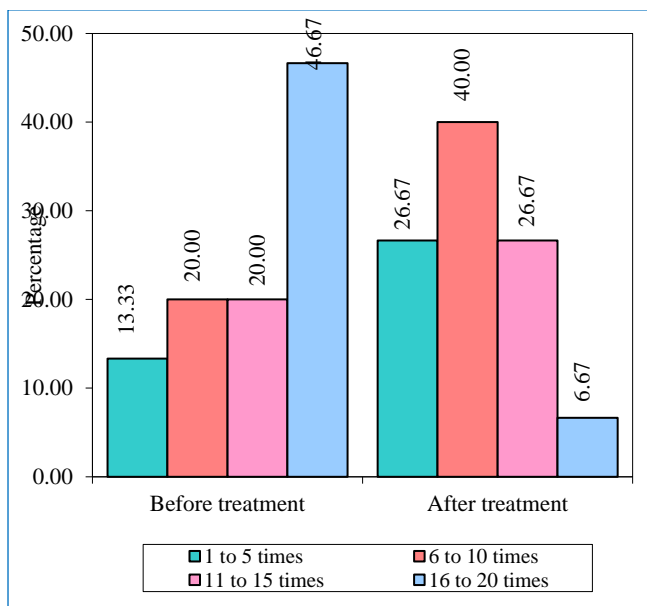

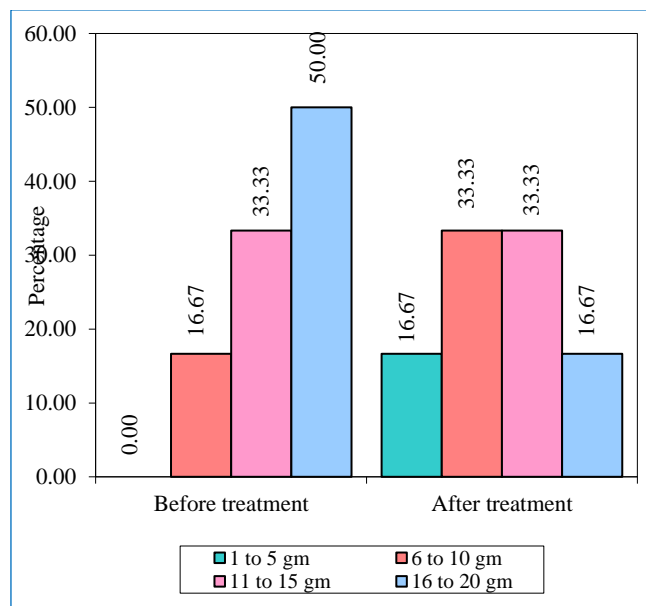**Figure 3: Comparison of before and after treatment with Quantity of Tobacco chewing**

Table 5: Comparison of before and after treatment with Quantity of Tobacco chewing.

Frequency of tobacco chewing	Before treatment	%	After treatment	%
1 to 5 gm	0	0.00	1	16.67
6 to 10 gm	1	16.67	2	33.33
11 to 15 gm	2	33.33	2	33.33
16 to 20 gm	3	50.00	1	16.67
Total	6	100.00	6	100.00

Table 7: Comparison of before and after treatment with Quantity of Gutka chewing.

Frequency of tobacco chewing	Before treatment	%	After treatment	%
1 to 5 Packets	1	11.11	3	33.33
6 to 10 Packets	1	11.11	4	44.44
11 to 15 Packets	2	22.22	1	11.11
16 to 20 Packets	5	55.56	1	11.11
Total	9	100.00	9	100.00

Table 6: Comparison of before and after treatment with status Quantity of Tobacco chewing by Wilcoxon matched pairs test.

Treatment	Mean	Median	IQR	% of change	Z-value	p-value
Before treatment	3.3	3.5	1.0			
After treatment	2.5	2.5	1.0	25.00	1.8257	0.0679 **

Table 8: Comparison of before and after treatment with status Quantity of Gutka chewing by Wilcoxon matched pairs test

Treatment	Mean	Median	IQR	% of change	Z-value	p-value
Before treatment	3.2	4.0	1.0			
After treatment	2.0	2.0	1.0	37.93	2.3664	0.0180 *

*p<0.10

*p<0.05

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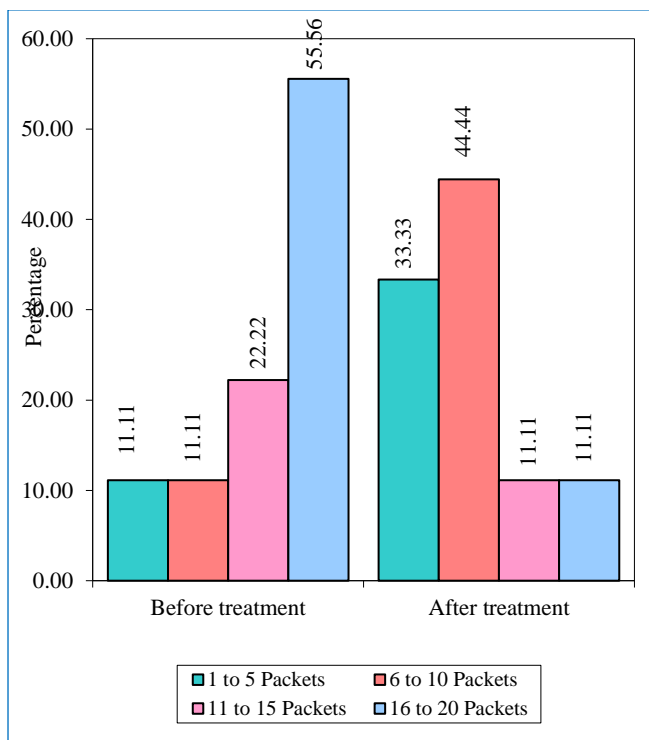**Figure 4: Comparison of before and after treatment with Quantity of Gutka chewing**

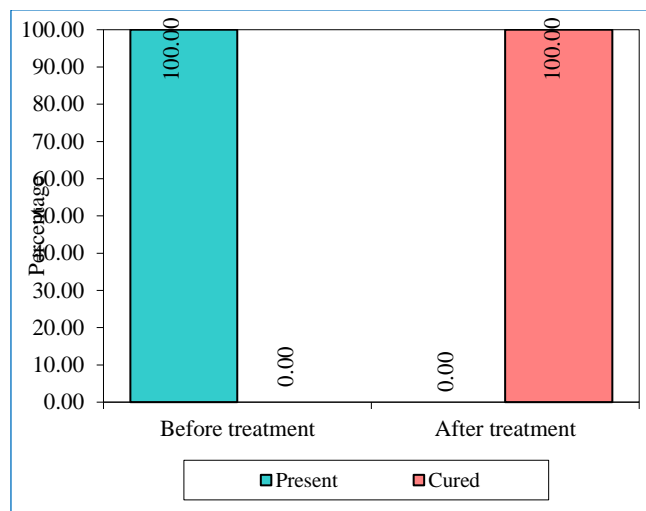**Table 9: Comparison of before and after treatment with status of gingivitis.**

Status of gingivitis	Before treatment	%	After treatment	%
Present	10	100.00	0	0.00
Cured	0	0.00	10	100.00
Total	10	100.00	15	100.00

Table 10: Comparison of before and after treatment with status Quantity of Gutka chewing by Wilcoxon matched pairs test.

Treatment	Mean	Median	IQR	% of change	Z-value	p-value
Before treatment	1.0	1.0	0.0			
After treatment	0.0	0.0	0.0	100.00	2.8031	0.00511*

*p<0.05

Figure 5: Comparison of before and after treatment with status of gingivitis

DISCUSSION

The intervention of *Kankshi Bhasma* is done in 15 patients and it's found highly significant in Grade 1 and 2 patients.

Since the Wilcoxon matched pair test is statistically highly significant, Hence *Kankshi Bhasma Danta Dhavan* is found to be highly significant in Extrinsic dental stain.

Owing to the *Paichilyahara* and *Dantasharkarahara, Vaishadyakara* properties and due to *Kashaya Rasa* of *Kankshi*, its proven to be effective against the tobacco dental stain.

The anti- inflammatory property proved to be 100 % efficient against gingivitis and stomatitis.

The hemostatic (*Shonitasthapana*) and *Ropana* property of *Kankshi* proved efficient in the bleeding gums and mouth ulcers.

It also showed significant changes in the reduction in the desire for tobacco chewing, as owing to its detoxifying properties, extremely beneficial in purifying the blood, which improves blood circulation and helps remove toxins from the body.

Its antimicrobial property inhibits the growth of gram positive and gram negative bacteria which also shown significant in the patients with toothache due to underlying cause of dental caries.

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The anticarcinogenic property of *Kankshi Bhasma* is effective against the mouth cancer.

Oral mucosal fibrosis (OSMF) characterised by severely limited mouth opening, blanching of oral mucosa and burning sensation in oral cavity was found in one of the patients was significantly improved after the use of *Kankshi Bhasma* for *Dantadhavan.*

CONCLUSION

The findings of this study conclude that *Kankshi Bhasma Dantadhavan* can produce significant changes in Grade 1 and Grade 2 stain and has shown a combined effect over gingivitis, bleeding gums, and overall oral cavity hygiene. The drug is easily available, easy to administer, easy to store, the time period of the study was short, yet proved significant in the extrinsic stain.

ACKNOWLEDGEMENT

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