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RESEARCH ARTICLE

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## AEONIC USE OF AYURVEDIC MEDICINE CONCOMITANT TO ENAMEL STAINS AND PERIODONTITIS

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### ABSTRACT

**Background:** Ayurveda is a traditional Indian therapeutic medicine from most ancient times. Ayurvedic medicine comprises plants, minerals, and heavy metals followed by people as part of their diet and exercise. Many scientific studies on ayurvedic medicine have known that one in five members using the medicine has a risk of metal poisoning because of heavy metals like lead, mercury and arsenic. **Aim:** The study's ultimate goal is to analyze the effect of ayurvedic medicine on extrinsic tooth stains and periodontitis. **Materials and Method:** Convenience sampling was done to select the study sample, and closed-ended questionnaires were given to the participants at an ayurvedic hospital in Chennai. One hundred and thirty participants were selected based on inclusion criteria. Lobene index, loss of attachment and community periodontal index was assessed. Descriptive statistics were calculated for the questionnaire recorded, and a chi-square test was done to determine the association between the intensity and area of lobene stain and between the loss of attachment and community periodontal index. **Results:** As per the contemporary study, 45.8% of participants used ayurvedic medicine for other reasons than ankle pain, body pain and skin allergy. The study showed that 32.7% had a light yellow colour covering upto 1/3rd, and 5.5% had a heavy stain covering more than 2/3rd of the tooth surface. Nearly 82.3% of participants reported no adverse reaction to ayurvedic medicine. **Conclusion:** There was an association between the community periodontal index and Lobene index, which obtained a P value of <0.05, which was statistically significant. **Clinical significance:** Consumption of ayurvedic medicine shows a positive association with enamel stains and periodontitis.

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## INTRODUCTION

Medicine is a fascinating subject; as days go on, modernizing life, disease patterns change. To lead a healthy life advancement of science is very important. Ayurveda, the traditional Indian therapeutic system, remains the most ancient yet living tradition with a sound, systematic and experimental basis. Ayurveda is derived from two words. Ayu means Life. It is a combination of body, senses, mind & soul. Veda is a Sanskrit word meaning science or knowledge. It is an ancient holistic science over 5000 years old with historical roots in the Indian sub-continent. It is a life science with a holistic approach to health and personalized medicine. It is a complete medical system that comprises physical, psychological, philosophical, ethical, and spiritual health (Semwal et al., 2015). The Ayurvedic system's fundamentals are essentially the self-healing science of each cell is

considered (Lad, 1984). Moreover, the comprehensive knowledge of Ayurveda's basic ideas is poorly acceptable scientifically due to a lack of evidence. Public interest in western medicine increased because of advanced techniques in modern days. But there are increased adverse effects in synthetic drugs, reduced treatment for chronic diseases, high cost of drugs and increased resistance. Since there is an increase in belief among the people towards the curing rate of ayurvedic medicine, advancements are necessary to treat all complicated cases (Chauhan et al., 2015). Ayurveda medicine is scientific and factual; some consider it a proto-science or trans-science system (Vaidya, 2006). According to the Rasa Shastra, there is a practice of adding metals, minerals or gems to herbal preparations, which may include toxic heavy metals such as lead, mercury and arsenic (Saper et al., 2008). As per a study in 1990, Ayurvedic medicines in India found 41% of arsenic and 64% lead and mercury (Dargan et al., 2008).

In 2004, levels of heavy metals were found in 20% and concluded that Ayurvedic products cause serious health risks (Saper *et al.*, 2004 and Dargan *et al.*, 2008). In 2008 more than 230 products were sold out containing at least 40% of heavy metals, and two studies reported in the USA state the lead content increase in the blood by about 40% (Yogi, ? and Breecher *et al.*, 2015). Heavy metals are active products of herbal medicine (Szabo, 2008 and Ernst, 2002), which can cause stains. Tooth staining is associated with many clinical and esthetical changes. They can impact a person's image and self-confidence, as tooth colour plays more priority. Dental stains differ in aetiology, appearance, composition, location, severity and degree of adherence. The attraction of material to the tooth surface plays a critical role in depositing extrinsic dental stains. Normally, tooth colour varies from the gingival margin to the incisal edge because of dentin and varies from primary to permanent. In most people, canine teeth are darker than central and lateral incisors. Teeth become darker as a physiological age changes; this can be because of laying down secondary dentin, incorporating extrinsic stains and gradual wear of enamel, allowing a greater influence on the colour of the underlying dentine. In addition, tooth wear and gingival recession can directly or indirectly affect tooth colour. Colour indications can be determined by viewing under sun light (most preferred) and this is known as metamerism. Stains are of two types intrinsic and extrinsic stains in Ayurveda mostly heavy metals can cause extrinsic stains which can be detected by scratch test with no pulpal involvement, but some can cause intrinsic stains with morphological involvement. Extrinsic stains can be removed by sonic or ultrasonic scaling; As a dentist we should help patient to overcome from problem by correct treatment and diagnosis so this study was an attempt to assess the stains in patients undergoing ayurvedic treatment (Prathap *et al.*, 2013).

## MATERIALS AND METHODS

A cross-sectional study was conducted among the people using Ayurvedic medicine to assess stains on teeth and their overall oral health status. Ethical clearance approval was given by the Department of Public health dentistry. Convenience sampling was chosen to select the study participants. The patients were selected mainly from Shree ayurvedic hospitals, Shantha ayurvedic hospitals, and Dr Sudhir ayurvedic hospitals in Chennai. The study was conducted in February 2020. The total number of individuals included in the study was 130. We have Included people using ayurvedic medicine for a minimum of six months to 3 years and people using the medicine for less than six months were excluded, people consuming coffee and tea, people who smoke, people who consume alcohol, chlorhexidine mouth wash for routine purposes, iron supplement consuming people were excluded. As coffee, tea, and ferrous sulfate contain tannin, which causes brown pigmentation, chlorhexidine mouth wash used for 4 weeks or more will cause a temporary stain. Each patient was examined for at least 10 minutes by a single operator with a sterile mouth mirror, with the aid of natural light and in some cases, natural light is not sufficient, torchlight was used to assess the stain index of tooth [intensity, area], dentition status, periodontal status, gingival recession. The stain index was recorded using a modified lobene stain index to determine the effect of stain on ayurvedic medicine. This involved assigning separate scores to each tooth's mesial, distal, labial, and lingual sites. For each site, stain intensity and areas were scored. The sum of (intensity X area) scores was calculated for all sites. In this intensity, areas were graded from zero to three; in this zero: no stain, 1: light stain covering 1/3<sup>rd</sup> of the region, 2: moderate stain covering 2/3<sup>rd</sup> region, 3: heavy stain covering more than 2/3<sup>rd</sup>. Periodontal status was recorded using a sterile CPITN probe by walking the probe technique along the gingival margin, followed by the periodontal screening and recording method (PSR). The probes have a ball tip of 0.5 mm, a black band between 3.5 mm and 5.5 mm, and black rings at 8.5 mm and 11.5 mm. The mentioned scores gave scoring of periodontal status, i.e. 0 absence of a bleeding condition, grade 1 presence of the condition, grade 2 presence of bleeding and pocket of 4-5mm, grade 3 presence of bleeding along with pocket of 6mm, grade 4 presence of bleeding along with the pocket depth of greater than 6mm. Loss of attachment was graded as 0 if no CEJ was

visible, one if CEJ within the black band, two if CEJ between the upper limit of the black band, and three if CEJ beyond the 11-5mm ring of the Williams probe. Statistical analysis was performed using SPSS. Descriptive statistics were carried out on the demographic details and questionnaire recorded, and a chi-square test was done to find the association between the Lobene stain- intensity and area and between the loss of attachment and community periodontal index people using Ayurvedic medicine.

## RESULTS

Table 1 shows the demographic details of the study population included in the study. Gradually more participants were under the age limit of 21-30 years old, which showed 28.0%, a higher percentage of males participating in the study of about 54.2%. Modified Kuppuswamy socioeconomic scale (2020) was recorded and found that 33.4% of study populations were in the lower middle class. Table 2 shows the questionnaire recorded among the study participants showed that 78.3% of participants used ayurvedic medicine twice a day. About 22.7% of participants use ayurvedic medicine for ankle pain, and 45.8% use it for other reasons. Tablet medicine is used in a higher percentage of 28.8% compared to syrup, paste and other forms. About 52.7% of participants mentioned there were no stains while using the medicine, and 82.3% of participants had no side effects after using the medicine. Table 3 shows the association between intensity and area of the Lobene index.

**Table 1. Demography characteristics of study population**

Demographic Details	Percentage	
Age	10-20	23.4
	21-30	28.0
	31-40	17.1
	41-50	18.0
	51-60	8.9
	61-70	4.6
Gender	Male	54.2
	Female	45.8
District	Tirupathi	53.6
	Chennai	46.4
Kuppuswamy scale	Upper	16.8
	Upper Middle	20.9
	Lower Middle	33.4
	Upper lower	15.8
	Lower	13.1

The percentage of Intensity among No stain, Light stain, Moderate stain and Heavy stain is 25.8%, 37.7%, 25.5% and 10%, respectively. On the other hand, the area of No stain, Covering 1/3<sup>rd</sup>, Covering 2/3<sup>rd</sup>, and Covering more than 2/3<sup>rd</sup> show the percentage value of 26.8%, 37.7%, 30% and 5.5 %, respectively. And on the association between intensity and area of Lobene index, the p-value was less than 0.05, which was statistically significant. Table 4 shows the descriptive statistics of attachment loss and community periodontal index among the study participants. In Loss of attachment, about 52.2% of participants had grade 1, which denotes CEJ within the black band. In the community Periodontal Index, about 32.3% of participants had bleeding with the pocket formation of 4-5mm. Table 5 shows the association between the Lobene index and community periodontal index. Lobene index 37.7% shows Grade 1 and in Community Periodontal Index 32.3% shows Grade 2. On association between both the index P value of <math>\lt; 0.05</math> was obtained and which was statistically significant.

## DISCUSSION

Ayurveda is one of the Indian traditional medical systems from the ancient period of life. This medicine comprises plants, minerals, and heavy metals, followed in the diet.

Table 2. Descriptive variable of questionnaire recorded

Questionnaire	Options	Percentage (%)
1. Since how long you have been using an ayurvedic medicine	Last six months	25.9
	Six months to one year	37.8
	One year to 3 year	22.7
	More than three year	13.6
2. For a day, how many times you will take medicine	Once	13.2
	Twice	78.5
	Thrice	8.3
3. For what reason you are using an ayurvedic medicine	Ankle pain	22.7
	Body pain	19.1
	Skin allergy	12.4
	Other reasons	45.8
4 In what form you will take medicine	Syrup	21.8
	Paste	20.6
	Tablet	28.8
	Other forms	28.8
5. Is there any stains while using the medicine	Yes	47.3
	No	52.7
6. Is there any discolourization of body secretions while usage of medicine	Yes	10.9
	No	89.1
7. Do you have a habit of smoking	Yes	37.2
	No	62.7
8. per day, how many cigarettes will you take	0	59.7
	1	13.6
	2	17.9
	3	8.8
9. Frequency of smoking	0	57.3
	1hour	18.5
	2hour	15.6
	3hour	8.6
10. Do you have a habit of chewing pan	Yes	19.5
	No	80.5
11. frequency of pan taking	No	82.1
	Daily	8.2
	Rarely	9.7
	Often	
12. how many pans will you take per day	0	75.5
	1	20.0
	2	4.5
	3	
13. Do you have a habit of alcohol	Yes	37.7
	No	62.3
14. how much frequently will you have alcohol	No	57.3
	Daily	19.1
	Rarely	16.8
	Often	5.8
15. How much quantity will you take	0	57.3
	1	20.3
	2	14.7
	3	7.7
16. Do you have any side effects after started using a medicine	Yes	17.7
	No	82.3

Table 3. Association between intensity and area of Lobene index

Intensity	Percentage	Area	Percentage	P value
NO stain	25.8	No stain	26.8	0.023*
Light stain	37.7	Covering 1/3 <sup>rd</sup>	37.7	
Moderate stain	25.5	Covering 2/3 <sup>rd</sup>	30.0	
Heavy stain	10	Covering more than 2/3 <sup>rd</sup>	5.5	

Table 4. Association between loss of attachment and community

Loss of attachment	Percentage	Community periodontal index	Percentage	P-value
CEJ not visible	16.4	Absence of condition	9.1	0.034*
CEJ within the black band	52.2	Presence of bleeding	9.1	
CEJ between within upper limit of black band 8.5mm	20.9	Presence of bleeding and pocket 4-5mm	32.3	
CEJ between 8.5mm and 11.5mm	10.5	Presence of bleeding and pocket 6mm	12.7	
		Presence of bleeding and pocket formation of more than 6mm	26.8	

**Table 5. Association between Lobene index and community periodontal index**

Lobene index	percentage	Community periodontal index	Percentage	P- value
Grade 0	26.3%	Grade 0	9.1%	0.021*
Grade 1	37.7%	Grade 1	9.1%	
Grade 2	27.8	Grade 2	32.3%	
Grade 3	8.2%	Grade 3	12.7%	
		Grade 4	26.8%	

Many scientific studies on ayurvedic medicine have known that one in five members using ayurvedic medicine had a risk of metal poisoning because of heavy metals like lead, mercury, and arsenic. As there is a reported review of literature on lead poisoning in blood, this study was done to know the effect of heavy metals on teeth. Not all tooth discolourization may be attributed to ayurvedic medicine. Various causes can cause stains as it can be due to coffee, smoking, some gram-positive microorganism like actinomycosis, associated with a child suffering from tuberculosis or cervical lymph node infection, chromogenic bacterial infections, or exposure to iron-containing oral solutions. People had genetic defects like dentinogenesis imperfecta and Amelogenesis imperfecta. People using antibiotics tetracycline and porphyria will cause a stain. A UK study showed that almost three-quarters of 74% (2,387) of extrinsic stains were present in non-smokers; the remaining 26% (828) of extrinsic stain were present in regular smokers (Alkhatib *et al.*, 2005). Extrinsic stains can be metallic and non-metallic stains, and metallic stains can be due to occupational exposure to metals or by using ayurvedic medicine. The non-metallic extrinsic stains are deposits due to dietary components, beverages, tobacco and mouth rinses. This study was a recent attempt to know whether any stains can be caused after using ayurvedic medicine and found that 37.7% of participants had a light stain based on intensity, and stains were covering within 1/3<sup>rd</sup> of the area. Association between the intensity and area of Lobene stain was calculated and obtained a P value less than 0.05 which was statistically significant and found that extrinsic stains were present on the patient consuming ayurvedic medicine. While examining the loss of attachment, it was found that 52.2% of participants had CEJ within the black band, considered grade 1. While examining the community periodontal index, 32.3% of participants had a presence of bleeding and a pocket of 4-5mm. Association between Lobene index and community periodontal index was determined and obtained a P value of 0.021, which was statistically significant. To the best of our knowledge, the association between Lobene stain and periodontal condition has not been recorded in previous studies, which is a major strength of the current study. The only limitation of the current study is that convenience sampling was used to collect data; consequentially, the generalizability of the present study's findings cannot be extrapolated to the general population.

## CONCLUSION

The study's finding shows that the people consuming ayurvedic medicine had an increased grade 1 Lobene stain, which denotes they are a light stain from yellow to light yellow colour stain with the area of stain covering upto 1/3<sup>rd</sup> of the area of the tooth.

They found that 32.7% of participants had light stains at least grade 3, which is 5.5% which denotes a heavy dark brown colour and stain covering more than 2/3<sup>rd</sup> of the tooth surface. Association showed that participants consuming ayurvedic medicine positively associated with Lobene stain, loss of attachment and community periodontal index.

**Clinical significance:** Consumption of ayurvedic medicine shows a positive association with enamel stains and periodontitis.

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