



A COMPARATIVE CLINICAL STUDY ON THE EFFICACY OF GANDUSHA WITH KHADIRA KASHAYA AND KAKUBHA KASHAYA IN MUKHASWASTHYA

¹Dr Vijaya B S and ²Dr Kempavva Kullur

¹Professor & HOD, Department of Samhita Siddhanta, SVPVVSamstha's Shri Veerpulikeshi Rural Ayurvedic Medical College, Hospital & Research Centre, Badami. Karnataka, India

²Associate Professor, Department of Dravyuaguna, SBVJVM's Grameen Ayurvedic Medical College Terdal, Karnataka, India

Abstract

Now a days Mukha Swasthya is one of the major disease occurring in the population. Due to Busy schedule of work, improper food habits and sedentary life style it is been considered as a negligible part of life. Habits like improper food consumption, smoking, tobacco chewing etc. have more incidences of causing diseases of oral cavity, and leading to a poor oral hygiene. There are some procedures mentioned in Ayurveda for mukha swasthya like Dhanta davana, jivha nirlekana, Mukha prakshalana kavala, Gandusha for maintenance of health hygiene as a part of daily regimen.

Hence a clinical study has been designed to evaluate the efficacy of Gandusha with kadira kashaya and kakubha kashaya w.s.r. to mukha swasthya. Clinical study was conducted in 20 patients attending OPD and IPD also from the campus of Grameen Ayurvedic Medical College hospital and research Centre Terdal.

The patients were administered khadira kashaya for group A and kakubha kashaya for group B The patients were followed up on 15th and 30th day all the patients completed their treatment and no adverse effects were reported during treatment and improved clinical symptoms and overall statistical significance is seen.

INTRODUCTION

The main aim of Ayurveda is Swasthya swasthya Rakshanam Aturasya Vikara Prashamanam, one can prevent the diseases, and the treatment for the diseased person is also told in Ayurveda, the person can prevent all kind of Vyadhis by adopting Dinacharya, Rutucharya etc. Vidhis told in Ayurveda, Dinacharya Adhyaya they explained about the Dantadhavana etc. ¹ preventing measures.

Nowadays due to lack of time, busy schedule of work and uncontrolled food habits, The oral hygiene has been a negligence part in a daily life. The prevalence rate of periodontal diseases varies from 55% in adolescents to 80% in adults²

As oral hygiene is very much concerned in Ayurveda for this Gandusha Vidhi explained, which help in preventing many oral problems such as bad breathe, poor taste perception, dryness of mouth. ³Many Dravyas are mentioned in classics for Gandusha as part of Dinacharya vidhi.

Acharya Vagbata in Dinacharya adhyaya told some of the Dravyas for the Danta Dhavana, which are having the Kashaya, Katu, Tikta rasas, ¹ in the sarvanga sundar commentary these Rasatraya acts good in case of Muka Vairasya, Arochaka, helps to remove excessive accumulation Shleshma in the oral cavity, here mainly the drugs like kadira and kakubha are consisting of tikta and kashya rasas. Hence the Kadira kashaya and kakuba kashaya Gandusha is said to improve the oral health by eliminating the mala Douragandhya and Asya vairasya.

The present study will be taken to evaluate the comparative role of khadira kashaya and Kakuba Kashaya with respect to Gandusha in Mukha Swasthya and promoting oral hygiene WHO defines Oral health as a "state of being free from chronic mouth and facial pain, oral and throat cancer, oral sores, birth defects such as cleft lip and palate, periodontal disease, tooth decay and tooth loss, and other diseases and disorders that affect the oral cavity"⁴

Daily practice of Gandusha helps in removing the conditions like Mukha dourgandhyata, asya vairasyata, mukha avishadyata, danta mala, praseka, shopa etc. According to asthanga hrudayakara, dravyas having predominant rasas of Kashaya, katu &



tikta these rasa's acts good in case of mukha vairasya aruchi etc and helps in removing excessive accumulated shleshma in the oral cavity.

The present study will be taken to evaluate the comparative role of khadira kashaya and Kakuba Kashaya with respect to Gandusha in Mukha Swasthya.

AIMS AND OBJECTIVES OF STUDY

- ☐ To evaluate the effect of kadhira kashaya Gandusha in improving Mukhaswasthya.
- ☐ To evaluate the effect of kakubha kashaya Gandusha in improving Mukhaswasthya.
- ☐ To compare the two groups and ascertain their efficacy in improving the Mukha Swasthya

MATERIALS AND METHODS

SOURCE OF DATA: The present study has been conducted by selecting the patients from OPD & IPD of GrameenAyurvedic Medical College Hospital and Research Centre Terdal, also from the campus of Grameen Ayurvedic Medical College Terdal. The Patient were screened on clinical grounds and taken for the study.

Method of preparation of khadira kashaya and kakubha kashaya

INGREDIENTS : 1.Kadira Twak Churna (1 pt) 2. Kakuba Twak Churna (1pt) 3.Water- 16 part

Method of Preparation : The khadira and kakubhatwak was collected and both drugs are made into the form of Yavakuta Churna and made the Kashaya as follows, 1 part of the drug is added into the 16 parts of the water & then mixture is heated on mandagni with continuous stirring till it reduces up to 1/8th part. The mixture is filtered through cloth and the obtained product issued for therapeutic administration.

Mode of administration of drug: Kashaya .Matra -6gm(1 kola)

Time of administration – Morning hour's Empty stomach **Duration-**1month

CRITERIA FOR SELECTION OF PATIENTS

- ☐ **CLINICAL SOURCES:** Patients will be randomly selected from OPD, OPD of Grameen Ayurvedic Medical College, Hospital & Research Centre Terdal and Government Hospital Terdal.

INCLUSION CRITERIA

1. Subjects aged between 18-50years
2. Subjects of either sex irrespective of their socio-economic status, educational qualification, marital status.
3. subjects with poor oral hygiene like bad odour, dry and chapped lips, patch, coated and fissured tongue, swollen gums, loose dentures, presence of tartar or plaque, loss of taste sensation.

EXCLUSION CRITERIA

1. Subjects with any systemic illness or under any medication for the same, known case of Oral CA.
2. People having the habit of smoking, use of tobacco and its products, pan chewing
3. Subjects with dental bracesinistration – Morning hour's Empty stomach

SELECTION OF PATIENTS : ASSESSMENT

The assessment will be done on 1st ,15th and 30th day, On the basis of subjective & Objective criteria.



Cover Page



SUBJECTIVE CRITERIA: On the basis of - Mukha dourgandyata, Asya vairasyata, Mukha avishadyata, Vaktra alaghavata, Danta mala, Dantasharkara

OBJECTIVE PARAMETERS:

OHAT criteria (oral health assessment tool) Oral hygiene index -S (OHI-Simplified) by Greene and Vermillion, 1964

CRITERIA FOR ASSESMENT OF RESULTS

1.Mukhadourgandyata

Grade	CRITERIA
0	No foul breath through- out the day .
1	Gets foul breath usually 3 hours after cleansing of mouth
2	Gets foul breath usually 6 hours after cleansing of mouth
3	Gets foul breath usually through- out the day, no diminished foul breathe even after cleansing of mouth

2.Asya vairasyata

Grade	CRITERIA
0	Proper taste perception, enjoys taste of food
1	Often complains regarding the taste of food
2	Shows no desires towards food but having the meal
3	Often skips meal

3.Mukha avishadyta

Grade	CRITERIA
0	Feeling of cleanliness of mouth throughout the day
1	Feeling of cleanliness for 3 hours of cleaning of mouth
2	Feeling of cleanliness for 6 hours of cleaning of mouth
3	No cleanliness of mouth seen even after cleansing

4.Vaktraalghavata

Grade	CRITERIA
0	Feeling of lightness through out the day
1	Feeling of lightness up to 3hrs after cleansing of mouth
2	Feeling of lightness up to 6hrs after cleansing of mouth
3	Feeling of heaviness throughout the day

5.Danta mala

Grade	CRITERIA
0	No debirs or stain present
1	Debirs covering 1/3rd of the teeth
2	Debirs covering 2/3rd of the teeth
3	Debirs covering complete over the teeth

6.Dantasharkara

Grade	CRITERIA
0	No calculus
1	Slight deposits (1mm)
2	Moderate deposits(2mm)
3	Heavy deposits(greater than 2mm)

OBJECTIVE CRITERIA

Oral Hygiene Index -S (OHI-Simplified) by Greene and Vermillion, 1964: The simplified Oral Hygiene Index (OHI-S) was introduced in 1964 by John C. Greene and Jack R. Vermillion as a modification of the oral hygiene index (OHI).



Examination Method and scoring system

The following definitions and criteria are used to determine the scores for each of the surfaces examined.

Debris index-Simplified (DI-S)

Calculus Index –Simplified (CI-S)

Calculation:

Hygiene Index.

i.e. $OHI - S = DI - S + CI - S$

Table showing Grading of debris

Grade	CRITERIA
0	No debris or stain
1	Soft debris covering not more than 1/3rd of tooth surface
2	Soft debris covering more than 1/3rd of tooth surface
3	Soft debris covering more than 2/3rd of the exposed tooth surface

Table showing Grading of debris

Grade	CRITERIA
0	No calculus present
1	1 supra gingival calculus covering not more than 1/3rd of exposed tooth surface
2	supra gingival calculus covering more than 1/3rd but not more than 2/3rd of the exposed tooth surface
3	Supra gingival calculus covering more than 2/3rd of the exposed tooth surface

RESULTS

In these randomized clinical study subjects with poor oral hygiene were treated with khadira kashaya in group A and kakubha kashaya in group b. the affect of the treatment was assessed periodically the parameters were recorded before and after treatment . The details of the same with statistical analysis adapting paired “t” test to assess the changes in the values before and after treatment and adopting the unpaired “t” test to compare the two groups.

Table Showing effect on Mukha Dourgandya

Groups	Mean difference (BT-AT)	Std.Deviation	Std.Error Mean	t value	p value
Group A	0.9	1.101	0.348	2.586	0.029
Group B	0.8	0.789	0.249	3.207	0.011

The result of the statistical analysis reveals that in Group A the mean difference was 0.9 and S.D. as 1.101. The result of paired t test shows that there is significant difference of Mukha Dourgandyata before and after the treatment (p value = 0.029). the analysis by applying paired t test proves that statistical significance of khadira kashaya in reducing mukha dourgandyata after gandusha procedure .similarly The result in Group B the mean difference was 0.8 and S.D. as 0.789. The result of paired t test shows that there is significant difference of Mukha Dourgandyata before and after the treatment (p value = 0.011).

Table showing effect on Asya Vairasyata

Groups	Mean difference (BT-AT)	Std.Deviation	Std.Error Mean	t value	p value
Group A	0.600	0.843	0.267	3.161	0.012
Group B	0.900	0.876	0.277	3.250	0.01



The result of the statistical analysis reveals that in Group A the mean difference was 0.600 and S.D. as 0.843 The result of paired “ t” test shows that there is significant difference Asya vairasyata before and after the treatment (p value = 0.012)that khadira kashaya is relieving asya vairasyata after gandusha procedure similarly ,The result of the statistical analysis of that in Group B the mean difference was 0.900 and S.D. as 0.876.The result of paired t test shows that there is significant difference in relieving Asya vairasyata before and after the treatment (p value = 0.01).

Table showing effect on Mukha Avaishadyata

Groups	Mean difference (BT-AT)	Std.Deviation	Std.Error Mean	t value	p value
Group A	0.7	0.947	0.269	2.333	0.045
Group B	0.5	0.527	0.167	3.000	0.015

The result of the statistical analysis reveals that in Group A the mean difference was 0.7and S.D. as 0.949 The result of paired t test shows that there is significant difference in Mukha vaishadyata before and after the treatment (p value = 0.045)that khadira kashaya is relieving mukha vaishadyata after gandusha procedure, similarly ,The result of the statistical analysis that in Group B reveals that the mean difference was 0.5 and S.D. as 0.527.The result of paired t test shows that there is significant difference before and after the treatment (p value = 0.01)

Table showing effect on Vaktra Alaghavata

Groups	Mean difference (BT-AT)	Std.Deviation	Std.Error Mean	t value	p value
Group A	1.1	1.101	0.348	3.161	0.012
Group B	0.6	0.516	0.163	3.674	0.005

The result of the statistical analysis reveals that in Group A the mean difference was 1.1and S.D. as 1.101. The result of paired t test shows that there is significant difference of vaktra alaghavata before and after the treatment (p value = 0.012) thus the khadira kashaya is relieving vaktra alaghavata,similarly The result of the statistical analysis reveals that in Group B the mean difference was 0.6 and S.D. as 0516. The result of paired t test shows that there is significant difference in vaktra alaghavata before and after the treatment (p value = 0.005).

Table showing effect on Dantamala

Groups	Mean difference (BT-AT)	Std.Deviation	Std.Error Mean	t value	p value
Group A	0.3	0.483	0.153	1.964	0.081
Group B	0.6	0.699	0.221	2.714	0.024

The result of the statistical analysis reveals that in Group A the mean difference was 0.3and S.D. as 0.483. The result of paired t test shows that there is significant difference of Danta mala before and after the treatment (p value = 0.081).thus khadira kashaya relieving the mala of danta similarly The result of the statistical analysis reveals that in Group B the mean difference was 0.6 and S.D. as 0699. The result of paired t test shows that there is significant difference in Danta mala before and after the treatment (p value = 0.024).

Table showing effect on Danta Sharkara

Groups	Mean difference (BT-AT)	Std.Deviation	Std.Error Mean	t value	p value
Group A	0.4	0.599	0.133	1.809	0.104
Group B	0.2	0.422	0.133	1.500	0.166

The result of the statistical analysis reveals that in Group A the mean difference was 0.4 and S.D. as 0.599 The result of paired t test shows that there is significant difference of Danta sharkara before and after the treatment (p value = 0.104).thus



Cover Page



khadira is relieving the danta sharkara ,similarly The result of the statistical analysis reveals that in Group B that the mean difference was 0.2 and S.D. as 0.422. The result of paired t test shows that there is significant difference in Danta sharkara before and after the treatment (p value = 0.166).

Table showing effect on Debris

Groups	Mean difference (BT-AT)	Std.Deviation	Std.Error Mean	t value	p value
Group A	0.5	0.85	0.269	1.861	0.096
Group B	0.7	0.675	0.213	3.280	0.100

The result of the statistical analysis reveals that in Group A the mean difference was 0.5 and S.D. as 0.85 The result of paired t test shows that there is significant difference of Debris before and after the treatment (p value = 0.096). hence khadira kashaya is relieving debris .The result of the statistical analysis reveals that in Group B the mean difference was 0.7 and S.D. as 0.675. The result of paired t test shows that there is significant difference in Debris before and after the treatment (p value = 0.100).

Table showing effect on calculus

Groups	Mean difference (BT-AT)	Std.Deviation	Std.Error Mean	t value	p value
Group A	0.4	1.033	0.306	2.499	0.037
Group B	0.1	0.966	0.306	1.964	0.081

The result of the statistical analysis reveals that in Group A the mean difference was 0.4 and S.D. as 1.033 The result of paired t test shows that there is significant difference of Calculus before and after the treatment (p value = 0.037) thus in khadira kashaya is relieving this condition The result of the statistical analysis reveals that in Group B the mean difference was 0.1 and S.D. as 0.966. The result of paired t test shows that there is significant difference in Calculus before and after the treatment (p value = 0.081). in kakuba kashaya in relieving the calculus

DISCUSSION: Discussion on Gandusha

Gandūsha is one of the procedure explained in Āyurvedic theories in the context of Dinacharya it has been attributed not only as promoter of oral hygiene but also taken as an Upakrama method in the management of Mukhagata Rogas. Regular practice of Gandūsha will exert cleansing action of mouth and promotes the defense mechanism in the oral cavity and thus prevent many oral disorders.so it is said that gandusha is having promotive preventive as well as curative effect. The definition of Gandūsha states that Gandūsha is the process of holding of any medicated liquid like Kashaya, Taila ,ghrita,madhu Swarasa, , Gomūtra, Ushnodaka etc. for specific time in the mouth to its full capacity without any movement till the nasal and eyes starts oozing , The benefits, types, indications, contraindications, Samyak yoga Lakshanas, Atiyoga and Heena yoga lakshanas are same for both Gandusha and kavala . Gandusha have fourfold benefits like health promotive, preventive, curative and restorative action in the maintenance of Mukha Swasthya.

Based on karmukata gandusha are of 4 types i.e. Snaihika, Shamana, Shodhana and Ropana Gandūsha which are useful in Vātaja mukharoga, Pittaja mukharoga, Kaphaja mukharoga and Vranas Of mukha respectively. While explaining the Gandūsha mātṛā, Shārangdharā says mouth full of liquid is the dose where as Vāgbhata has given mātṛā for liquid as 1/2, 1/3rd, 1/4th of the capacity of the oral cavity as Pravara, Madhyama and Avara mātṛā respectively.

Discussion on drugs

In the present study two groups are involved where khadira kashaya and Kakuba Kashaya are used for gandusha to evaluate their efficacy in improving Mukha Swasthya. As explained in contexts that Khadira is having laghu ruksha gunas and kapha pitta shamaka properties and it relieves the conditions like kandu, shotha and it also dantya. Vrana ropana Guna which will



Cover Page



be helpful in removal of debris and maintenance of Mukha Swasthya. And properties of kakubha as it is having kashaya rasa as a dominant taste with laghu ruksha properties inferring the lekha property of the and having action of vrana hara ,raktapiitahara ,kapha pitta action this dravyas is taken for the present clinical study to observe the action in mukha gata rogas .

Part of Khadira twak churna and kakubha twak churn as taken along with of water and boiled in moderate temperature till it was reduced to ml. It was then filtered using a cloth and administered to the person selected for the study. Dosage of the Kashaya is 6gm according to sharangdhara or to ones mouth full capacity

DISCUSSION ON EFFECT OF THERAPIES : MUKHA DOURGANDYATA

Effect on Mukha Dourgandya - Due to the predominance of sleshma in the oral cavity and due to improper food habits and Poor oral hygiene practices accumulation of food particles leads to Mukha Dourgandya. Mukha Dourgandya is one of the properties of gandusha, the statistical analysis reveal that in Group A, the initial mean score of Mukha Dourgandya was 1.30 which was reduced to 0.40 after treatment. This signifies 90% reduction. The t value for the data was 2.586 thus giving a highly significant result , (p<0.001) as khadira kashaya is relieving mukha dourgandya having may be due to Shothahara, Krimighna and Mukha Shodhakara Properties of the medicine. in group B, initial mean score of Mukha Dourgandya was 2.00, which reduced to 1.20 indicating 80% reduction. The t value for the data was 3.207 thus proving the significance(P<0.001) of Kashaya in reducing the Mukha Dourgandya after gandusha procedure. Laghu, Rooksha, Kapha Shamaka, Lekhana Guna of Kakubha kashaya might have helped in the reduction of Mukha Dourgandya. Hence both khadira kashya and kakubha kashya is relieving the conditions and by observing my studies shows that both the kashayas are highly significant in maintenance of mukha swasthya

Effect on Asya Vairasyata

Due to poor oral hygiene, improper food habits, increase in Kapha Dosha and accumulation of food particles over tongue leads to improper taste perception i.e. Asya Vairasyata. The statistical analysis reveal that in Group A, the initial mean score of Asya Vairasyata was 0.80 which was reduced to 0.20 after treatment. This signifies 60% reduction. The t value for the data was 3.161. thus giving a significant result (P<0.001) As khadira kashaya is Kaphahara, laghu and ruksha guna in nature, it removes the excess Kapha, thereby Asya Vairasyata is reduced and having moderate effect.

In group B, initial mean score of Asya Vairasyata was 1.50, which reduced to 0.60 indicating 90 % reduction. The t value for the data was 3.250, showing significant result (P<0.001) hence it can be inferred that kakubha kashaya having ruksha guna ,reduced kapha property and having high effect . Hence both khadira kashya and kakubha kashya is relieving the conditions and by observing my studies shows that both the kashayas are highly significant in maintaining mukha swasthya.

Effect on Oral Hygiene Index -Simplified (OHI -S)

OHI-S consists of 2 components, debris index and calculus index. Debris is fragments of mucosal membrane also foreign matter. This matter adhered to the mouth . Calculus or tartar is a form of hardened plaque which is primarily composed of calcium phosphate. It is caused by the precipitation of minerals from saliva in plaque on the teeth. The reduction in the score signifies the oral cleanliness.

Effect on debris

The statistical analysis reveal that in Group A, the initial mean score of debris was 1.20, which was reduced to 0.70 after treatment. This signifies 50% reduction in debris The t value for the data was 0.096, thus giving a significant result (P<0.001) in group B, initial mean score of debris was 1.40, which reduced to 0.70 indicating 50% reduction in debris. The t value for the data was (p=0.100) showing insignificant result Hence both khadira kashya and kakubha kashya is relieving the



Cover Page



conditions and by observing my studies shows that both the kashayas are moderately significant acting in maintenance of mukha swastya.

Effect on calculus

The statistical analysis reveal that in Group A, the initial mean score of calculus was 1.20 which was reduced to 0.80 after treatment. This signifies 40% reduction in calculus. The t value for the data was 2.449, thus giving a significant result ($P < 0.001$). In group B, initial mean score of calculus was 1.00, which reduced to 0.90 indicating 10% reduction in calculus. The t value for the data was ($p < 0.001$) showing significant result. Hence both khadira kashya and kakubha kashya is relieving the conditions and by observing my studies shows that both the kashayas are mildly significant in maintenance of mukha swastya.

Discussion on Methodology

This study was an Open randomized clinical trial which involved 20 subjects, divided into 2 groups of equal sample size. Subjects with poor oral hygiene, between the age group of 18 to 50 years, fulfilling the Inclusion and Exclusion Criteria studying or working in and around grameen ayurvedic medical college, hospital and research centre terdal and were selected for the study after getting a written consent from every subject. The Signs and Symptoms of Poor Oral Hygiene like Mukha Dourgandhya, Asya Vairasya, Vaktra Alaghavata, Mukha Avaishadyata, Dantamala and Dantasharkara were mainly considered for the diagnosis as per Ayurvedic guidelines and Oral Health Assessment Tool Guidelines for the Diagnosis of Poor Oral Health in modern point of view. 20 subjects with poor oral hygiene were randomly categorized into 2 equal groups. Group A- 10 subjects-gandusha with khadira kashaya, once in the morning before food with a dose of Discussion Group B-10 subjects-gandusha with Kakubha kashaya once in the morning before food with a dose of ml. The assessment of the subjects was done on 1st day, 15th day and 30th day. Subjective criteria were Mukha Dourgandhya, Asya Vairasya, Vaktra Alaghavata, Mukha Avaishadyata, Dantamala and Dantasharkara. Objective criteria were OHAT criteria (oral health assessment tool), and Oral hygiene index -S (OHI-Simplified) by Greene and Vermillion.

DISCUSSION ON OVERALL ASSESSMENT

GROUP – A : Based on my Analysis of over all effect of the treatment in the patients of group A showed good improvement. The treatment was given with thirty days of Gandūsha with khadira kashya which was highly significant reduction in the symptoms of mukha rogas. None of the patients develop any complications, or any untoward symptom or any side effects during the course of treatment in the study group and therefore the treatment modalities is safe and is of therapeutic value.

The above said observations indicate that patients have shown improvement in all the criteria of assessment of mukha swastya. The therapeutic effects like mukha dourgandya, mukha avishadyata, vaktra alaghavata, danta mala etc. are relieved. The ultimate effect will be the good oral health improvement.

GROUP – B : Based on my Analysis of over all effect of the treatment in the patients of group B showed moderate improvement compared to group A. The treatment was given with thirty days of Gandūsha with kakubha kashya which was moderately significant in reduction in the symptoms. None of the patients develop any complications, or any untoward symptom or any side effects during the course of treatment in the study group.

Observations on my study based on % of recovery reveals that on calculating mean % of group A is 85.625% and mean % recovery of group B is 68.375%.

Conclusion

Conclusion is an essence part of any study, By an interactive literary review and based on clinical trials the following conclusions can be drawn:



- ☐ Gandūsha is one of the procedures explained in the Dinacharya adhyaya which has been attributed as a promoter of oral hygiene.
- ☐ Gandūsha can be taken as an Upakrama in the management of Mukhagata diseases
- ☐ Mukha swastya is also one of the important measure to lead a healthy life .
- ☐ The conditions like mukha dourgandyata ,asya vairasyata, vaktra alaghavta ,danta mala ,danta sharkara , are releiving in case of both khadira kashaya and kakubha kashaya.
- ☐ Observation on my study shows that % recovery group A is high when compared % of recovery of group B hence it can be infered that khadira kashaya holds good in mukha swastya when compared to kakubha kashaya.
- ☐ Gandūsha vidhi is considered as effective and easy procedure adopted in maintainence of mukha swastya.

REFERENCES

1. Asthangahridaya,Sutrasthana, Dinacharyaadhyaya 2nd shloka –Dr.Rvidyanath- book of chaukambasurbharathiprakashana,Varanasi
2. [http:// www. Idamember.nohp.org.in/about_us1/national oral health programme/ 2016/ feb./25/13:34/IDA member health centre.](http://www.Idamember.nohp.org.in/about_us1/national%20oral%20health%20programme/2016/feb/25/13:34/IDA%20member%20health%20centre)
3. vol-1 edited by kavirajatrivedvagupta, krishnadasaacademy,varanasi reprint 2002,Pp408. P.25.
4. Vagbhata,asthangasangraha, hindivyaakhya
5. World Health Organization. Oral Health Fact Sheet no 318. April 2012. Available at: URL: [http:// www.who.int/mediacentre/factsheets/fs318/en/index.htm](http://www.who.int/mediacentre/factsheets/fs318/en/index.htm)
6. Vagbhata: Ashtanga Sangraha withHindi Commentary, by Shri. KavirajaAtrideva Gupta,Vol-1; Chowkhamba Krishnadasa Academy; Varanashi. p.223
7. VridhhaVagbhata: Ashtanga Hrudaya with Commentaries of Sarvangasundaraof Arunadatta & Ayurveda Rasayana of Hemadri edited by Pt.Hari SadashivaShastri Paradakara,Choukambha SanskritSamsthana, Varanashi Reprint(2012); p.300
8. Ibid. VridhhaVagbhata: Ashtanga Hrudaya Sutrasthana 22/3-4, p.299
9. Ibid. Sushruta: Sushruta Samhita, Chikitsasthana 40/64, p.558
10. Ibid. Vagbhata: Ashtanga Sangraha, Sutrasthan 31/3, p.223
11. Ibid. Sharangadhara: Sharangdhar Samhita, UttaraKhanda 10/2-3 , p.352
12. Ibid. Vagbhata: Ashtanga Sangraha, Sutrasthana31/4, p.223
13. Ibid. VridhhaVagbhata: Ashtanga Hrudaya,Sutrasthana 22/10-11, p.299-300
14. Ibid. Vagbhata: Ashtanga Sangraha, Sutrasthana31/10-12, p.224
15. Ibid. Sharangadhara: Sharangdhar Samhita,UttaraKhanda 10/6-7, p.353
16. Ibid. Sharangadhara: Sharangdhar Samhita,UttaraKhanda 10/5 , p.352
17. Yoga Ratnakara: Yogaratnakar VidyitiniHindi commentary by Vaidya LakshmipatiShastri, Edited by BhishagratnaShri Brahmashankar Shastri, Reprinted,Chaukhamba Prakashana, Varanasi,(2013), p.58 [YR Nityapravrutti Prakarana30-31]
18. A text book of Dravya guna vijnana by – Dr.Prakash L.Hegde and by Dr.harini volume 2.page no,387- 402
19. A text book of Dravya guna vijnana by – Dr.Prakash L.Hegde and by Dr.harini volume 2.page no 58-64