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RESEARCH ARTICLE

A STUDY OF KAVALA UPAKRAMA IN MAINTAINING ORAL HEALTH W.S.R. OF PUTIVAKTRA (HALITOSIS)

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ABSTRACT

Oral diseases can be very troublesome and can have bad impact on quality of life. Every people certainly face one or other oral problem in their life time. Bad breathing is one of the common mouth problems which reflect poor oral hygiene and some time systemic diseases, but rather than this, it can be a serious cause of embracement many times, resulting in lowering the self confidence and depression. *Kavala* is a simple procedure, mentioned as a part of *Dinacharya*, which upon practicing routinely, highly beneficial in oral conditions. *Triphala* has been explained in *Ayurveda* literatures with great importance in number of diseases. In mouth diseases *Triphala* is indicated very frequently, available widely, cost effective, with no or minimal side effects and suitable for all age groups. So this study was needed to evaluate the effectiveness of well emphasized and a cost effective therapy in managing and preventing *Putivaktra* and other oral conditions.

INTRODUCTION

Ayurveda is the science of life; it describes each and every aspect of human health, including preventive, curative and promotive aspects. *Ayurveda* is just not a medical science but a way of life to gain physical, mental, spiritual and social well being up to optimum level. Among its vast range of subjects, a particular pathological condition has been selected for the current study named "*Putivaktra*". "Oral health" has a gross meaning; it includes health of components of oral cavity, i.e. tooth, gum, etc. Oral diseases can be primary (due to oral cause) and secondary (due to systemic cause), but most of the oral diseases has an oral cause. Oral health is the integral part of general health; it has certain impact on quality of life, and most of the time it reflects status of hygiene, and has a strong relationship with socio-economic factors. The incidence of oral diseases is higher in people from deprived areas. The term *Putivaktra*¹ is cited in *Ayurveda* literatures as a "disease of mouth", in which noticeably unpleasant odour is present on the exhaled breath. Oral malodour (*Mukhadourgandha*) is the only symptom mentioned in the disease *Putivaktra*, so *Mukhadourgandha* can be taken as synonymous to *Putivaktra* in practice. The main causative factor of *Putivaktra* is failure to do proper teeth brushing, *Kavala*, *Gandusha* etc. Consuming heavy, cold and dry foods; fish, black gram, sugarcane etc. excessively are some of the dietary factors responsible for oral diseases and so for *Putivaktra*. Most of the oral diseases are caused by *Kapha Dosha* and for *Putivaktra* also *Kapha Dosha* is mainly responsible. The disease *Putivaktra* can be co-related with 'HALITOSIS' in modern science. It is estimated that 30% of world population suffers from this problem regularly². Bad breath can have oral or systemic cause, but most of the patients (up to 90%) have bad breath due to an oral cause³, which reflects poor oral hygiene. This is one of the common oral diseases. This condition can be restored by proper oral hygiene practice. *Kavala*^{4,5,6,7} is described in *Ayurveda* literatures as procedure to maintain oral health and to treat many oral diseases. In this procedure medicated or non medicated liquid is half-filled in the mouth and allowed to move within mouth for a certain period, and then the liquid should be emitted out. It can be called as 'Gargling'. This procedure has certain cleaning effect due to movement of the liquid in the mouth, and other effects depending upon medicine used and its temperature Many procedures have been mentioned to maintain oral hygiene, i.e. *Kavala*, *Gandusha*, *Dantadhavana*, *Pratisarana* and *Jivha Nirlekhana*. Among these procedures, *Dantadhavana* (teeth brushing), *Pratisarana* (massaging teeth and gum with powder) and *Jivha Nirlekhana* (tongue scraping) act on a specific part of the mouth; *Gandusha* (holding liquid in mouth for specific period) acts in whole oral cavity but has no movement action but the *Kavala* acts on each part of oral cavity with added benefit of its movement action which serves better cleaning effect due to its pressure. Keeping this in mind the *Kavala* procedure was selected for this study to get maximum effect on the given condition *Kavala* has been mentioned as a part of *Dinacharya* (daily regimen) to prevent and even to cure oral diseases as well as diseases of head and neck region and to strengthen these body parts. *Kavala* is one of the important procedures to maintain health.

For *Kavala* procedure many of the drugs can be used which are mentioned in the context of Oral diseases. It was found on reviewing the various *Ayurveda* literatures that the *Triphala* is the medicine which was used extensively along with combination of other medicines for the *Kavala* in a vast range of oral diseases. *Triphala* was not used as a single medicine in any of the oral diseases by Ancient *Acharyas*, as found on literary review. *Triphala* is also regarded as *Rasayana* which reflects that the *Triphala* is having no or minimal side effects. Keeping above factors in mind the *Triphala Kwatha* was selected as a prototype of medium for doing *Kavala* as other medicines can be added in this preparation according to condition and need. *Triphala* is the combination of three drugs i.e. *Amalaki*, *Haritaki* and *Bibhitaki*. The dry fruits of above drugs are used in equal quantity to prepare the medicine *Triphala*. For the current study the *Triphala Kwatha Choorna* was taken to prepare *Triphala Kwatha*.

AIM AND OBJECTIVES

- To study the effect of *Kavala* with *Triphala Kwatha* in *Putivaktra*.
- To study the importance of *Kavala* in maintaining oral hygiene.
- To outline the common oral diseases.
- To study the disease *Putivaktra*.

MATERIALS AND METHODS

Source of data

Literary source

- Classical textbook of *Ayurveda*.
- Articles, journals and other published work.
- Related source of data from internet.

Clinical source

Patients of *Putivaktra* were selected according to classical sign and symptoms from OPD of *Swastharakshana* Department of Rani Dullaiya Smriti *Ayurveda P.G. Mahavidyalaya Evam Chikitsalaya*, Bhopal.

Drug source

Triphala Kwatha Choorna – All the ingredients of *Triphala* were obtained from Rani Dullaiya Smriti Pharmacy and made coarse powder from the same pharmacy. All the ingredients of *Triphala* were taken in equal quantity as mentioned in *Bhava Prakasha Samhita*.

Instruments

- PH indicator strips – used to assess the PH of saliva in the patients as objective parameter.
- Dental mirror and periodontal probe – used for examination of oral cavity to know hygienic condition of oral cavity and other intra-oral diseases.

Method

Pilot study to decide the dosage of *Kavala*: To decide the quantity of liquid for *Kavala*, a pilot study was done on 3 subjects, and it was seen that around 30-40 ml of liquid is needed to fill the mouth by half and for easy movement of liquid in mouth.

Study design

Selection of patients: It was a clinical study of 30 patients of *Putivaktra* selected as per sign and symptoms explained in *Ashtanga Hridaya*. Patients were selected by random sampling procedure with respective age between 18 to 60 years.

Grouping: 30 patients selected for the study, were allotted in a single group. Patients were assessed by using both subjective and objective parameters before, during and after treatment, i.e. on day 0, 30th day and 45th day. Medicine was given for 30 days and total study duration was 45 days.

Grading: The grading was given both for subjective and objective parameters and individual variables are tabulated and data was subjected for statistical analysis.

Inclusion criteria

- Patients having classical sign and symptoms of *Putivaktra*.
- Patients between ages 18 to 60 year of either sex.

Exclusion criteria

- Patients less than 18 and more than 60 year of age.
- Patients having other pre-diagnosed systemic diseases which can cause
- Halitosis.
- Patients not fit for *Kavala Upakrama*.

- Patients with any chronic oral disorders like oral cancer etc.

Kavala Dharana Vidhi for this study: The method of medicine application was kept simple so the patient can use it on daily bases. Patients were advised to add 5 gram (1 table spoon approximately) of *Triphala Kwath Choorna* in 80 ml of fresh water and boil it on low flame to reduce the water to 40 ml. This solution is filtered and allowed to cool down to lukewarm temperature. Patients were told to fill this solution in mouth by half and to move this solution inside the mouth just after brushing at morning till they feel watering of eyes and nose, then to spit it out.

Pashachat Karma (Post Operative Procedure) - Patients were advised to gargle with lukewarm water just after doing *Kavala*. Patients were also advised to avoid cold wind or water and to stay nil by mouth for 10 minutes after doing *Kavala*.

Timing and Duration of Kavala: *Kavala* was advised to patients for once daily at morning, just after teeth brushing, for 30 days.

Pathya – Apathya – Patients were advised to avoid Tobacco, Gutkha and alcohol during and after therapy. No dietary control was made.

Parameter

Subjective – *Mukhadourgandha*

Objective

- Organoleptic test
- Tongue coating index
- Salivary PH

Organoleptic test for bad breath: Even though instruments are available for testing bad breath, Organoleptic assessment by physician is still the gold standard in the examination of bad breath malodour. It is solely based on the olfactory organs of the clinician.

Procedure: The subject opens the mouth and refrains from breathing while physician should examine the mouth and can smell the air from open mouth of the subject.

- Patient asked to lick his/her wrist, after allowing the wrist to dry, organoleptically assess it to evaluate breath odour.
- A sample of coating was taken from the back of the tongue which is pulled with gauze pad to evaluate mal odour.
- All the above 3 procedures were done on patients to get an average of intensity of odour.

Rating

In this test exhaled air was assessed by using intensity rating from 0 to 5, as proposed by T Murata, T Yamaga –

- 0 = No odour (odour cannot be detected)
- 1 = Questionable odour (odour is detectable, although examiner could not recognize it as malodour)
- 2 = Slight malodour (odour is deemed to exceed the threshold of malodour recognition)
- 3 = Moderate malodour (malodour is definitely detected)
- 4 = Strong malodour (strong malodour is detected but can be tolerated by the examiner)
- 5 = Severe malodour (overwhelming malodour is detected and cannot be tolerate by the examiner)

Note – This was ensured that patient and judge didn't take garlic, smoking, alcohol or from last 12 hours.

Tongue coating index: Apart from Organoleptic test, 'tongue coating index' has a good practical value in assessment of Halitosis, because tongue coating, including bacteria, desquamated cells, and saliva, among others, is one of the most important etiological factors of halitosis.

Procedure: Patients asked to open his/ her mouth; tongue coating was assessed by direct inspection of tongue in good light and under the rating scale with 4 grades, as proposed by Yaegaki k, Coil JM-

- 0 = no tongue coating.
- 1 = thin coating over 1/3rd of the tongue dorsum.
- 2 = thin coating over 2/3rd or thick coating over 1/3rd.
- 3 = thick coating over 2/3rd of tongue.

PH evaluation of saliva of patient

Salivary PH evaluation was done using PH strip on-table at OPD.

Procedure: At least 2 hour fasting was ensured for patients before doing salivary PH test. For collecting the saliva, patients were asked to collect and fill their mouth with saliva then to spit it out then again to collect the saliva and spit it out and the saliva of 3rd time was used to check the PH level. Patients were asked to spit their saliva in sufficient quantity in a disposable plastic spoon and a piece of PH paper was dipped in this sample. The PH paper changes colour immediately. The colour of PH paper then compared with the colour index to determine the exact PH range of saliva. The minimal salivary PH is considered as 3 which is strongly acidic and 7 PH is considered as normal. The PH range was divided into 4 grades, as follows

- PH 7 = normal
- PH 6.9 to 6 = mild acidic

- PH 5.9 to 5 = moderate acidic
- PH 4.9 to 3 = severe acidic

Intervention

A single group

- Sample size – 30 patients
- Drug – *Triphala Kwatha Choorna*
- Procedure – *Kavala*
- Dose – Quantity that fill mouth by half (about 30–40 ml)
- Duration of the procedure – until watery discharge from eyes and nose
- Duration of treatment – 30 days
- Assessment during treatment – 1st assessment on day 0
2nd assessment on 30th day
- Post treatment follow up – 1st follow up or post-treatment follow up on 45thday (15 days after stopping medicine)

Scoring of assessment variables: Scoring of assessment variables

S.N.	Scoring assessment	Normal grade (G0)	Mild grade(G1)	Moderate grade (G2)	Severe grade (G3)
1.	<i>Mukhadourgandha</i>	No <i>Dourgandha</i>	Occasional	Intermittent	Persistent
2.	Organoleptic test	No odour	Questionable to Slight malodour	Moderate malodour	Strong to Severe malodour
3.	Tongue Coating	No coating	Thin coating over 1/3 rd of dorsum of tongue	Thin coating over 2/3 rd	Thick coating over 2/3 rd
4.	Salivary PH	PH 7	PH 6.9 to 6	PH 5.9 to 5	PH 4.9 to 3

Assessment of clinical improvement

Clinical improvement of the disease was based on improvement in the clinical finding and reduction in the severity of the symptoms of the disease, after treatment and at post-treatment follow up.

Grading for the clinical improvement for individual variables

- **CI –III (Clinical improvement – grade 3)** - Excellent, i.e. 3 degree reduction in the severity score, against the initial score i.e. severe to normal.
- **CI –II (Clinical improvement – grade 2)** - Good, i.e. 2 degree reduction in the severity score, against initial score, i.e. reduction from moderate to normal or severe to mild.
- **CI –I (Clinical improvement - grade 1)** - Encouraging, i.e. 1 degree reduction in the severity score, against initial score, i.e. reduction from mild to normal, moderate to mild or severe to moderate.
- **C.S. (Clinically stable)** - i.e. severity score remaining same against the initial score.
- **C.D. (Clinically deteriorated)** – i.e. severity score increased against the initial score.

Statistical analysis -The data collected before treatment, on the completion of treatment and at post treatment follow up were statistically analysed by using paired 't' test with the help of bio-statistician.

Instruments used in the study

- PH Strip
- Periodontal Probe
- Dental Mirror

OBSERVATIONS AND RESULTS

In the present study 30 patients suffering from *Putivaktra*, fulfilling inclusion criteria were taken randomly for clinical study and made a single group. The observation for present study were done in the following stages

Section I – Generalized observations of all patients

Section II

- Observation of the sign and symptoms before treatment, after treatment and on post-treatment follow up.
- Results on the completion of treatment and on post-treatment follow up .

Section III –Result related statistics.

Total 40 patients were registered from the Swastharakshana OPD of Rani Dullaiya Smriti Ayurveda P.G.Mahavidyalaya Evam Chikitsalaya, Bhopal, for the study, out of which 6 patients dropped out the study. Among 34 remaining patients, 30 patients were selected randomly for the observation and result.

Section I

Generalized observations of all patients

Incidence of age-

Table Distribution of patients according to age (n=30) –

S.NO.	Age	No. of patients	% of patients
1.	18-28	24	80
2.	29-39	2	6.7
3.	40-50	2	6.7
4.	51-61	2	6.7

Observation: It was observed that 24 patients (80%) were of 18-28 age group, 2 patients (6.7%) were of 29-39 age group, 2 patients (6.7%) were of 40-50 age group and 2 patients (6.7%) were of 51-61 age group

Incidence of sex

Table. Distribution of patients according to sex (n=30) –

S.no.	Sex	Number of patients	% of patients
1.	Male	27	90
2.	Female	3	10

Observation: It was observed that 27 patients (90%) were male and 3 patients (10%) were female.

Incidence of marital status

Table. Distribution of patients according to marital status(n=30)

S.no.	Marital status	No. of patients	% of patients
1.	Unmarried	18	60
2.	Married	12	40
3.	Widow	0	0
4.	Divorced	0	0

Observation: It was observed that 18 patients (60%) were married and 12 patients (40%) were unmarried.

Incidence of diet

Table. Distribution of patients according to diet (n=30) –

S.no.	Diet	No. of patients	% of patients
1.	Vegetarian	7	23.3
2.	Mix	23	76.6

Observation: It was observed that 7 patients (23.3%) were vegetarian and 23 patients (67.7%) patients were taking mix diet.

Incidence of *Vihara* (Oral hygien method)

Brushing material

Table. Distribution of patients according to brushing material(n=30)

S.no.	Brushing material	No. of patients	% of patients
1.	Toothbrush	30	100
2.	Stalk of plant	0	0
3.	Finger	0	0

Observation: It was observed that all the 30 patients (100%) were using toothbrush as brushing material and none of them use stalk of plants or finger to brush teeth.

Teeth cleaning material

Table no- Distribution of patients according to teeth cleaning material (n=30)

S.no.	Cleaning material	No. of patients	% of patients
1.	Tooth paste	26	86.7
2.	Tooth powder	4	13.3
3.	Other	0	0

Observation: It was observed that 26 patients (86.7%) use tooth paste for cleaning teeth and 4 patients (13.3%) use tooth powder.
Frequency of brushing

Table. Distribution of patients according to frequency of brushing

S.no.	Frequency of brushing	No. of patients	% of patients
1.	Once daily	20	66.7
2.	Twice daily	10	33.3
3.	More in 24 hrs.	0	0

Observation: It was observed that 20 patients (66.7%) were doing brush once a day and 10 patients (33.3%) were doing brush twice a day.

Tongue scraping

Table - Distribution of patients according to tongue scraping (n=30)

S.no.	Tongue scraping	No. of patients	% of patients
1.	Not doing	14	46.7
2.	Doing with finger	8	26.7
3.	Doing with scraper	8	26.7

Observation: It was observed that 14 patients (46.7%) were not doing tongue scraping, 8 patients (26.7%) were using finger for tongue cleaning and 8 patients (26.7%) were using scraper for tongue cleaning.

Incidence of Prakriti

Table - Distribution of patients according to Prakriti (n=30)-

S.no.	Prakriti	No. of patients	% of patients
1.	Vata	0	0
2.	Pitta	0	0
3.	Kapha	0	0
4.	Vata Pitta	6	20
5.	Pitta Kapha	14	46.7
6.	Kapha Vata	10	33.3
7.	Sama Prakriti	0	0

Observation: It was observed that 6 patients (20%) were of Vata Pitta Prakriti, 14 patients (46.7%) were of Pitta Kapha Prakriti and 10 patients (33.3%) were of Kapha Vata Prakriti.

Incidence of Agni

Table - Distribution of patients according to Agni (n=30) –

S.no.	Agni	No. of patient	% of patient
1.	Teekshna	2	6.7
2.	Vishama	9	30
3.	Manda	4	13.3
4.	Sama	15	50

Observation: It was observed that 2 patients (6.7%) have Teekshna agni, 9 patients (30%) have Vishama agni, 4 patients (13.3%) have Manda agni and 15 patients (50%) have Sama agni.

Distribution of patients according to severity of symptoms

Incidence of Mukhadourgandha (Subjective)

Table. Distribution of patients according to Mukhadourgandha (n=30)

S.no.	Mukhadourgandha	No. of patient	% of patient
1.	None (normal)	4	13.3
2.	Occasional (mild)	11	36.7
3.	Intermittent (moderate)	10	33.3
4.	Persistent (sever)	5	16.7

Observation: Mukha dourgandh is kept as subjective parameter. It was observed that 4 patients (13.3%) were not aware of their oral malodour, but they were told by their family members or friends that they have foul smell from mouth, so those patients came for check up and treatment. 11 patients (36.7%) had occasional (mild) Mukha dourgandh, 10 patients (33.3%) had intermittent (moderate) Mukha dourgandh and 5 patients (16.7%) had persistent (severe) Mukha dourgandh.

Distribution of patients according to Organoleptic test (n=30)

S.no.	Grade of organoleptic test	No. of patient	% of patient
1.	No odour (normal)	0	0
2.	Questionable & slight malodour (mild)	11	36.7
3.	Moderate malodour (moderate)	12	40
4.	Strong & severe malodour (severe)	7	23.3

Observation: It was observed on organoleptic test that, 11 patients (36.7%) had questionable or slight malodour (mild), 12 patients (40%) had moderate malodour and 7 patients (23.3%) had severe oral malodour.

Distribution of patients according to coating of tongue (n=30)

S.no.	Tongue coating	No. of patient	% of patient
1.	No coating (normal)	3	10
2.	Thin coating over 1/3 rd (mild)	6	20
3.	Thin coating over 2/3 rd or thick coating over 1/3 rd (moderate)	13	43.3
4.	Thick coating over 2/3 rd (severe)	8	26.7

Observation: It was observed on tongue coating examination that, 3 patients (10%) had no tongue coating, 6 patients (20%) had thin coating over 1/3rd of tongue, 13 patients (43.3%) had thin coating over 2/3rd or thick coating over 1/3rd of tongue and 8 patients (26.7%) had thick coating over 2/3rd of tongue.

Distribution of patients according to salivary PH (n=30) –

S.no.	Salivary PH	No. of patient	% of patient
1.	PH 7 (normal)	3	10
2.	PH 6.9 to 6 (mild)	14	46.7
3.	PH 5.9 to 5 (moderate)	10	33.3
4.	PH 4.9 to 3 (severe)	3	10

Observation: It was observed on salivary pH examination that, 3 patients (10%) had salivary PH ranging between 7 (normal), 14 patients (46.7%) had PH ranging between 6.9-6 (mild acidic), 10 patients (33.3%) had PH ranging between 5.9-5 (moderate acidic) and 3 patients (10%) had PH ranging between 4.9-3 (severe acidic).

Section II

Observation of the sign and symptoms before treatment, after treatment and on post-treatment follow up Assessment criteria – Mukhadourgandha

Table. Grade of Mukhadourgandha before treatment, after treatment and on post-treatment follow up

S.no.	Mukhadourgandha	NR G0	%	MLDG1	%	MDR G2	%	SVRG3	%
1.	Before treatment	4	13.3	11	36.7	10	33.3	5	16.7
2.	After treatment	14	46.7	8	26.7	6	20	2	6.7
3.	Post-treatment follow up	6	20	13	43.3	6	20	5	16.7

Observation: It was observed that the symptom of Mukhadourgandha was of normal grade in 4 patients, mild grade in 11 patients, moderate in 10 patients and severe in 5 patients, before treatment. After treatment it was of normal grade in 14 patients, mild grade in 8 patients, moderate grade in 6 patients and severe grade in 2 patients. On post-treatment follow up it was of normal grade in 6 patients, mild grade in 13 patients, moderate grade in 6 patients and severe grade in 5 patients.

Assessment criteria Organoleptic test**Table- Grade of Organoleptic test before treatment, after treatment and on post-treatment follow up**

S.no.	Organoleptic test	NR G0	%	MLD G1	%	MDR G2	%	SVR G3	%
1.	Before treatment	0	0	11	36.7	12	40	7	23.3
2.	After treatment	12	40	9	30	6	20	3	10
3.	Post-treatment follow up	5	16.7	11	36.7	8	26.7	6	20

Observation: It was observed that the Organoleptic test was of normal grade in 0 patients, mild grade in 11 patients, moderate in 12 patients and severe in 7 patients, before treatment. After treatment the test was of normal grade in 12 patients, mild grade in 9 patients, moderate grade in 6 patients and severe grade in 3 patients. On post-treatment follow up the test was of normal grade in 5 patients, mild grade in 11 patients, moderate grade in 8 patients and severe grade in 6 patients.

Assessment criteria – Tongue Coating**Table. Grade of Tongue Coating before treatment, after treatment and on post-treatment follow up**

S.no.	Tongue Coating	NRG0	%	MLDG1	%	MDR G2	%	SVRG3	%
1.	Before treatment	3	10	6	20	13	43.3	8	26.6
2.	After treatment	10	33.3	13	43.3	4	13.3	3	10
3.	Post-treatment follow up	3	10	11	36.7	11	36.7	5	16.7

Observation: It was observed that the Tongue Coating was of normal grade in 3 patients, mild grade in 6 patients, moderate in 13 patients and severe in 8 patients, before treatment. After treatment it was of normal grade in 10 patients, mild grade in 13 patients, moderate grade in 4 patients and severe grade in 3 patients. On post- treatment follow up it was of normal grade in 3 patients, mild grade in 11 patients, moderate grade in 11 patients and severe grade in 5 patients.

Assessment criteria – PH of Saliva

Table. Grade of PH of Saliva before treatment, after treatment and on post-treatment follow up

S.no.	PH of Saliva	NR G0	%	MLDG1	%	MDR G2	%	SVRG3	%
1.	Before treatment	3	10	14	46.7	10	33.3	3	10
2.	After treatment	14	46.7	13	43.3	3	10	0	0
3.	Post-treatment follow up	3	10	19	63.3	5	33.3	3	10

Observation: It was observed that the PH of Saliva was of normal grade in 3 patients, mild grade in 14 patients, moderate in 10 patients and severe in 3 patients, before treatment. After treatment it was of normal grade in 14 patients, mild grade in 13 patients, moderate grade in 3 patients and severe grade in 0 patients. On post- treatment follow up it was of normal grade in 3 patients, mild grade in 19 patients, moderate grade in 5 patients and severe grade in 3 patients.

Results on the completion of treatment and on follow up

Table– Result on completion of treatment

S. no.	Assessment criteria	CI-III	%	CI-II	%	CI-I	%	CS	%	CD	%
1.	Mukhadourgandha	0	0	2	6.7	16	53.3	12	40	0	0
2.	Organoleptic test	0	0	4	13.3	18	60	8	26.7	0	0
3.	Tongue coating	0	0	3	10	19	63.3	8	26.7	0	0
4.	PH of saliva	0	0	3	10	18	60	9	30	0	0

RESULTS

Excellent response (CI -3) – Patients who improved severity level by 3 grades, i.e. from severe to normal. None of the patients showed excellent response.

Good response (CI-2) – Patients who improved severity level by 2 grades, i.e. from severe to mild or from moderate to normal. 2 patients (6.7%) in *Mukhadourgndh*, 4 patients (13.3 %) in organoleptic test, 3 patients (10%) in tongue coating and 3 patients (10%) in salivary ph level showed good response to the treatment.

Encouraging response (CI-1) – Patients who improved severity level by 1 grade, i.e. from severe to moderate or from moderate to mild or from mild to normal. 16 patients (53.3%) in *Mukhadourgndh*, 18 patients (60%) in organoleptic test, 19 patients (63.3%) in tongue coating and 18 patients (60%) in salivary ph level showed encouraging response to the treatment.

Clinically stable (C.S.) – Patients who did not show any change in sign or symptom on the completion of treatment. 12 patients (40%) in *Mukhadourgndh*, 8 patients (26.7%) in organoleptic test, 8 patients (26.7%) in tongue coating and 9 patients (30%) in salivary ph level showed no change.

Clinically deteriorating (C.D.) – Patients who showed deterioration in sign or symptoms on the completion of treatment. None of the patients showed deterioration.

Result on post-treatment follow up

Table– Result on post-treatment follow up

S. no.	Assessment criteria	CI-III	%	CI-II	%	CI-I	%	CS	%	CD	%
1.	Mukhadourgandha	0	0	0	0	6	20	24	80	0	0
2.	Organoleptic test	0	0	0	0	11	36.7	19	63.3	0	0
3.	Tongue coating	0	0	0	0	7	23.3	23	76.7	0	0
4.	PH of saliva	0	0	0	0	5	16.7	25	83.3	0	0

Result

Excellent response (CI -III) – Patients who improved severity level by 3 grades, i.e. from severe to normal. None of the patients showed excellent response on post- treatment follow up.

Good response (CI-II) – Patients who improved severity level by 2 grades, i.e. from severe to mild or from moderate to normal. None of the patients showed good response on the post-treatment follow up.

Encouraging response (CI-1) – Patients who improved severity level by 1 grades, i.e. from severe to moderate or from moderate to mild or from mild to normal. 6 patients (20%) in *Mukhadourgndha*, 11 patients (36.7%) in organoleptic test, 7 patients (23.3%) in tongue coating and 5 patients (16.7%) in salivary ph level showed encouraging response to the treatment on 1st follow up.

Clinically stable (C.S.) – Patients who did not show any change in sign or symptom on the completion of treatment. 24 patients (80%) in *Mukhadourgndha*, 19 patients (63.3%) in organoleptic test, 23 patients (76.7%) in tongue coating and 25 patients (83.3%) in salivary ph level showed no change as compared to beginning date on the 1st follow up.

Clinically deteriorating (C.D.) – Patients who showed deterioration in sign or symptoms on the completion of treatment. None of the patients showed deterioratio

Section III

Statistical analysis of results of individual clinical sign and symptomson completion of treatment and on post-treatment follow up

Statistical analysis of result on *Mukhadourgandha*

Table– Statistical analysis of result on *Mukhadourgandha* – oncompletion of treatment and on post-treatment follow up

Variable	Grade	Mean	Difference of SD	Difference of SE	't' value	'p' value
<i>Mukhadourgandha</i>	BT	1.53	0.60	0.11	6.02	<0.0001
	AT	0.866				
	BT	1.53	0.4068	0.07428	2.693	<0.05
	P.T. F/W	1.33				

Statistical analysis of result on Organoleptic test

Table Statistical analysis of result on Organoleptic test– oncompletion of treatment and on post-treatment follow up –

Variable	Grade	Mean	Difference of SD	Difference of SE	't' value	'p' value
Organoleptic test	BT	1.867	0.6280	0.1148	7.549	<0.0001
	AT	1.00				
	BT	1.867	0.4901	0.08949	4.097	<0.0001
	P.T. F/W	1.50				

Statistical analysis of result on Tongue Coating

Table. Statistical analysis of result on Tongue Coating – oncompletion of treatment and on post-treatment follow up

Variable	Grade	Mean	Difference of SD	Difference of SE	't' value	'p' value
TongueCoating	BT	1.83	0.5921	0.1081	7.709	<0.0001
	AT	1.00				
	BT	1.83	0.4302	0.07845	2.971	<0.001
	P.T. F/W	1.60				

Statistical analysis of result on PH of Saliva

Table. Statistical analysis of result on PH of Saliva – on completionof treatment and on post-treatment follow up

Variable	Grade	Mean	Difference of SD	Difference of SE	't' value	'p' value
PH ofSaliva	BT	1.43	0.6103	0.1114	7.180	<0.0001
	AT	0.633				
	BT	1.43	0.3790	0.6920	2.408	<0.01
	P.T. F/W	1.267				

Overall assessment of result– on completion of treatment and onpost-treatment follow up

On completion of treatment

- Complete cure – 5 patients (16.7%)
- Markedly improved – 5 patients (16.7%)
- Moderately improved – 9 patients (30%)
- Mild improvement – 5 patients (16.7%)
- Unchanged – 6 patients (20%)

On post-treatment follow up

- Complete cure – 0 patients (0%)
- Markedly improved – 0 patients (0%)
- Moderately improved – 3 patients (10%)
- Mild improvement – 8 patients (26.7%)
- Unchanged – 19 patients (63.3%)

CONCLUSION

On the basis of this research work, it can be concluded as following

- Most of the people are not aware about oral hygiene methods and its importance specially the people from low socio-economical background.
- Most of the oral diseases are caused by bad oral hygiene and Halitosis which can be compared with *Putivaktra*, is also mostly caused by bad oral hygiene.
- Bad oral hygiene is a common cause for production of oral diseases and many a time it causes multiple oral diseases simultaneously and they co-exist.
- *Kavala* with *Triphala Kwatha* is very effective in Halitosis.
- *Kavala* with *Triphala Kwatha* is very effective in reducing tongue coating.
- *Kavala* is very effective in normalizing the salivary PH.
- *Kavala* should be done daily and regularly as stopping the *Kavala* can reverse the symptoms of *Putivaktra* and other oral conditions.

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