



# International Journal of Indian Medicine

[www.ijim.co.in](http://www.ijim.co.in)

**ISSN: 2582-7634**

**Volume - 5, Issue - 5**  
**May 2024**



# IJIM

INDEXED



# International Journal of Indian Medicine

Access the article online



International Category Code (ICC): ICC-1702

International Journal Address (IJA): IJA.ZONE/258276217634

## AYURVEDIC MANAGEMENT OF POST COVID XEROSTOMIA- A CASE STUDY

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**Introduction:** Xerostomia is defined as the sensation of oral dryness. It is generally present as a symptom rather than a disease. The common causes of xerostomia can be side effects of medication, Sjogren syndrome, radiotherapy, and other autoimmune disorders. Recently xerostomia was reported in many patients suffering from COVID-19 or in post recovery phase. Xerostomia can be correlated to *Talushosha* mentioned in *Talugata rogas* in ayurveda. For xerostomia artificial saliva products are advised but they had few drawbacks. This case report highlights the role of ayurvedic intervention and therapeutic procedures in the management of symptoms of xerostomia in a patient of post recovery phase of COVID-19; without any side effect.

**Materials and methods:** a 48-year-old man diagnosed with post COVID xerostomia presented with the chief complaints of dryness of oral cavity, burning of mouth, bad breath and lack of sense of taste. Ayurvedic medicine *Yastimadhu siddha dugdha* for therapeutic procedure of *Gandusha* planned for the patient for a duration of one month. Pre and post -assessment was done by inspection of oral cavity and questionnaire method.

**Result and conclusion:** at the end of the treatment, patient experienced positive changes. In this study, ayurvedic intervention of oral medication and *Gandusha* procedure was found effective and satisfactory to the patient.

**Keywords:** Xerostomia, *Talushosha*, COVID-19, *Gandusha*, Dry mouth

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**How to cite this article:** Gupta S, Sharma A, Sangolli K.S. Ayurvedic management of post Covid Xerostomia- A case study . Int J Ind Med 2024;5(5):37-44

DOI: <http://doi.org/10.55552/IJIM.2024.5501>

## Introduction:

Xerostomia is the subjective feeling of oral dryness which may be due to hyposalivation. Saliva plays a vital role in the protection mechanism of buccal cavity. Xerostomia is generally present as a symptom rather than a disease and is characterized by dryness of mouth, bad breath, burning of oral cavity, altered taste and difficulty in swallowing, etc <sup>[1]</sup>. As many aetiologies have been described for dry mouth, it may be due to side effect of various medications, can be associated with Sjogren syndrome and even secondary to head and neck radiation therapy. <sup>[2]</sup> the prevalence of xerostomia ranges from 5.5% to 46% in the population <sup>[3]</sup>. In 2020, during COVID pandemic, xerostomia was found as a symptom in many patients. A study was conducted in 1017 COVID- 19 patients and the prevalence of xerostomia was found to be 43% among them <sup>[4]</sup>. It probably was because of the inflammation followed by atrophy of salivary glands by sars-cov-2<sup>[5]</sup>. Management of xerostomia includes regular intake of water and fluids and local topical measures, such as saliva substitutes <sup>[6]</sup>. Based on the similarities of symptoms, xerostomia may be correlated to *Talushosha* mentioned in *Talugata rogas* in ayurveda under *Mukharogas*. *Talusosha* is characterized as excessive dryness, cracks and dyspnea <sup>[7]</sup> and even may be secondary to fever and excessive exertion <sup>[8]</sup>. The management of *Talushosha* mentioned by *Acharya Sushruta* is *Snehana*, *Swedana* and other *Vata shamana chikitsa* <sup>[9]</sup>.

## Patient information

A 48-year-old male patient reported in OPD on July 2021 with complaints of dryness of mouth, sore throat, burning sensation in mouth for past 1 month. Even after brushing the teeth twice daily, he was having bad breath. He was previously detected as positive for COVID-19 about 45 days prior to the OPD visit. Since then, he also complained of decreased sensation of taste. On detailed history, symptoms started during COVID-19 positive phase, but, continued even after

recovery. He already took allopathic medication for the same but no satisfactory relief in symptoms was noticed with that. Medical history showed that no other systemic illness was there.

## Clinical findings

**Physical examination:** The patient was afebrile. Pulse rate was 76/min, respiratory rate was 18/min and blood pressure was 114/80mmhg. No history of diabetes mellitus, hypertension. History of COVID -19 1.5 months back.

## Local examination

**On inspection / Darshan Pariksha:** After taking the history from the patient local examination of the oral cavity was done by inspection <sup>[10]</sup>. The picture of the oral cavity was taken before the initiation of the treatment and features of the disease was shown [Figure 1]

The general findings on inspection before starting of the treatment mentioned in the table given below [Table 1]

## On palpation / Sparsha Pariksha

1. Salivary gland on palpation found to be non-tender.
2. On touching, finger adhere to the oral mucosa.

## Timeline

The patient experienced the symptoms like dryness of mouth, burning sensation, bad breath, lack of taste and sore throat. After visiting the OPD, he underwent the treatment for 30 days. The procedure was started from 12<sup>th</sup> July 2021 and continued till 13<sup>th</sup> August 2021. He attended three follow-ups, two in between the treatment on 8<sup>th</sup> and 16<sup>th</sup> day and the last one was on 31<sup>st</sup> day, i.e., after completion of the treatment.

## Diagnostic assessment

Patient was assessed using subjective characteristics (*lakshanas*) of *Talushosha* mentioned in ayurvedic classics and subjective symptoms of xerostomia <sup>[11]</sup>. [Table 2] Challacombe scale was used for assessing dry mouth clinically <sup>[12]</sup>. Total score is 10 that indicates severe dryness. [Table 3]

### Intervention

For the *Mukha Rogas* one of the effective procedure *Gandusha* is mentioned in the classics that. *Yastimadhi Siddha Gandusha* was given for a period of one month three times per day of the treatment of *TaluShosha*. [Table 4]

### Follow up and outcomes

After starting the treatment follow up was done 8<sup>th</sup>, 16<sup>th</sup> and 31<sup>st</sup> day. The reduction in the dryness of parts of oral cavity was assessed and mentioned in percentage on the follow up days. [Table 5]

The changes in the buccal cavity on 8<sup>th</sup> day and 31<sup>st</sup> was shown the pictures. [Figure 2], [Figure 3]

On palpation

On 8<sup>th</sup>, 16<sup>th</sup> and 31<sup>st</sup> day of treatment

1. Salivary gland on palpation found to be non-tender.
2. On touching, finger not adhere to the oral mucosa.

The assessment of *lakshanas* like dryness of mouth, burning sensation, sore throat, halitosis and hypogusia was done by questionnaire method (*prashna pariksha*) and relief in the symptoms told by the patient were reported in percentage form. [Table 6]

### DISCUSSION

The etiological factors that precipitated this patient's condition may be infection of sars-cov-2 that caused inflammation and atrophy of salivary glands and led to hyposalivation. According to *Acharya Sushruta*, vitiation of *vata* and *pitta* causes dryness of mouth and is responsible for other symptoms which were present in this patient. Also, COVID-19 can be considered as a *vishama-jwara*. *Acharyas* have mentioned that *Talushosha* can be present secondary to *jwara*. Based on this, this case of xerostomia may be correlated to *Talu shosha*.

### Probable mode of action of yastimadhu siddha dugdha

*Talushosha* occurs due to vitiation of *vata* as well as *pitta*. The combined effect of *vata* and *pitta* leads to symptoms like dryness of mouth, burning

sensation, sore throat. If not treated, it will further cause complications like hypogeusia, halitosis and even dyspnoea. *Yastimadhu siddha dugdha gandusha* used for the management of *talushosha* [13]. *Yastimadhu* and *Dugdha* being *vata pitta shamaka* [14],[15] directly cause *samprapti vighatana* of the *roga* and overcome the *shosha* of *mukha* and *deernta*. Both *dravyas* having *madhura rasa*, *madhura vipaka* and *sheeta virya*, so, they reduce burning sensation in mouth. *Madhura rasa* enlivens the function of mouth throat and tongue [16]. It also nourishes the sense organs and thus helps to regain the sense of taste [17]. *Snigdha guna* of *yastimadhu* and *ksheera* will provide soothing effect, moisten the oral cavity and help in proper hydration of the buccal mucosa [18] [19]. *sheeta virya* of both the *dravyas* will exhilarate and moisten the oral cavity [20]. It also reduces the *pitta* [21]. [Table 7]

### Probable mode of action of Glycyrrhiza glabra

*Glycyrrhiza glabra* has natural sweetness and it may stimulate the gustatory salivary reflex that will further help in reducing the dryness of mouth [22]. It is also having antimicrobial and anti-inflammatory action [23]. *G. Glabra* credits to antioxidant activity, as it contains flavonoids and isoflavone that will reduce the chance of further cell damage [24]. Polysaccharide in *Glycyrrhiza glabra* raises the immune response by stimulating macrophages and also shows immunostimulating activity [25]. Furthermore, it prevents virus multiplication and disrupts the virus particle; thereby, having potential immunomodulatory activity [26]. All these properties will act on cell level and help in reduction of symptoms of *Talu Shosha* and elimination of the disease.

### Probable mode of action of milk

Many of the chemical and physical properties of milk appears same to that of saliva. Hence it may act as a good saliva substitute. Moreover, it provides lubrication and moisture to the dry oral mucosa. It also buffers oral acids. Hence it reduces oral health problems related with

hyposalivation [27]. Thus, the combined effect of *Yastimadhu Siddha Dugdha* and *Gandusha* shows effective result in the management of xerostomia in post COVID-19 patient.

#### Probable action of *gandusha* procedue

*Gandusha* is a process of holding any oil, decoction, *Ghrita* or any liquid in mouth to its full capacity without any movement for specific time [28]. Mechanical pressure is exerted by medicated liquid filled in oral cavity which stimulate mechanoreceptors and chemoreceptors in oral cavity. It will transfer signal to brain where the salivary nuclei are situated. This will cause the activation of parasympathetic nervous system; as a result of which facial and glossopharyngeal nerves come into action and stimulate the salivary gland to secrete more saliva [29]. The warm medicated liquid used for *Gandusha* will increase the vascular permeability and the active constituents of medicated liquid irritate the oral mucosa. Thus, medicated liquid get rapidly absorbed and helps to cure the disease [30]. *Gandusha* with medicated liquid will also help in dislodging the metabolic waste food debris and infective microorganism present in oral cavity. Thus, helps in improving the oral hygiene and maintain the pH of oral cavity [31].

#### CONCLUSION

Xerostomia has a variety of possible causes. It may even be secondary to various diseases. During the COVID-19 pandemic, there were many patients having the complaints of dryness of mouth and loss of sensation of taste. *Yastimadhu Siddha Dugdha Gandusha* proved to be highly effective in reducing the subjective symptoms of xerostomia in this post COVID-19 patient without any side effects. Also, he was advised to take more of fluid-based diet during and even post treatment. Since the effect is monitored in one patient only with focusing on the subjective symptoms of xerostomia hence for the forth coming researcher may pursue further study in this aspect.

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## TABLES

**Table -1: Clinical findings on inspection**

Lips	Dry
Gums	Lustreless, blackish decolouration
Teeth	Dental caries present, plaque, stains present
Tongue	Fissured and dry
Oral mucosa	Erythematous, dry
Palate	Glassy appearance and excessive blood capillaries seen with food debris
Floor of mouth	No saliva pooling

**Table - 2: Lakshana of disease**

Lakshana of Talushosha	Subjective symptoms of xerostomia
<ol style="list-style-type: none"> <li>Excessive dryness</li> <li>Cracks</li> <li>Breathing difficulty</li> </ol>	<ol style="list-style-type: none"> <li>Dryness of mouth</li> <li>Fissured tongue</li> <li>Burning sensation in and mouth bad breath</li> <li>Lack of taste</li> <li>Swallowing and breathing difficulty</li> </ol>

**Table - 3: Challacombe scale table**

Feature	Total scale
<ol style="list-style-type: none"> <li>Mirror sticks to buccal mucosa</li> <li>Mirror sticks to tongue</li> <li>Saliva frothy</li> </ol>	Total score of 1-3 indicates mild dryness

4. No saliva pooling in floor of mouth 5. Tongue shows generalised mild depapillation 6. Gingival architecture is smooth	Total score of 4-6 indicates moderate dryness.
7. Glassy appearance of oral mucosa, especially palate 8. Tongue lobulated /fissured 9. Cervical caries in more than two teeth 10. Debris on palate sticking to teeth	Total score of 7-10 indicates severe dryness.

**Table - 4: Intervention**

Drug	<i>Yastimadhu siddha dugdha</i>
Dose	Holding medicated liquid in mouth without doing any movement inside or 10-20ml (as per patient capacity)
Procedure	<i>Gandusha karma</i>
Time of administration	3 time/day
Time	For 1month
Follow up	8 <sup>th</sup> , 16 <sup>th</sup> day 31 <sup>st</sup> day

**Table - 5: Follow up and outcomes (On inspection clinical findings)**

Part	0 <sup>th</sup> day (12/07/2021)	8 <sup>th</sup> day (20/07/2021)	16 <sup>th</sup> day (28/07/2021)	31 <sup>st</sup> day (14/08/2021)
Lips	Dryness (70%)	Dryness (25%)	No dryness	No dryness
Gums	Blackish discolouration present lustreless	Blackish discolouration present Lustreless	Pinkish and with lustre	Pinkish and with lustre
Teeth	Dental caries present Plaque present Stains present	Dental caries present plaque present Stains present	Dental caries present Plaque absent Stains present	Dental caries present Plaque absent Stains present
Tongue	Fissured (90%)	Fissured (80%)	Fissured (60%)	Fissured (40%)
Oral mucosa	Erythematous (80%) dry (90%)	Erythematous (50%) Dry (60%)	Erythematous (20%) Dry (25%)	Pink and hydrated
Palate	Glassy appearance present (60%) Excessive blood capillaries seen	Glassy appearance (30%) No blood capillaries seen	Glassy appearance (10%) No blood capillaries seen	Pink and Normal
Floor of mouth	Lustreless No saliva pooling	Lustreless Dry	Pink with lustre and Hydrated	Pink with lustre and Hydrated



**Table -6: Assessment of lakshanas (By questionnaire method /prashna pariksha)**

Subjective parameters	0 <sup>th</sup> day (12/07/2021)	8 <sup>th</sup> day (20/07/2021)	16 <sup>th</sup> day (28/07/2021)	31 <sup>st</sup> day (14/08/2021)
Dryness of mouth	Present (90%)	Present (60%)	Present (20%)	Absent
Burning sensation	Present (75%)	Present (35%)	Present (5%)	Absent
Sore throat	Present (65%)	Present (20%)	Absent	Absent
Halitosis	Present (80%)	Present (40%)	Absent	Absent
Hypogeusia	Present (60%)	Present (40%)	Present (20%)	Absent

**Table - 7: Drug review**

S.no	Dravya	Rasa	Guna	Virya	Vipaka	Doshaghanta
1	Yastimadhu	Madhura	Guru, snigdha	Sheeta	Madhura	Vata-pitta-rakta shamaka
	Ksheera	Madhura	Guru, snigdha	Sheeta	Madhura	Vata-pitta shamaka

**FIGURES**

fig.1



fig.2



fig.3

**Source of Support: None declared****Conflict of interest: Nil**

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