INTERNATIONAL JOURNAL OF RESEARCH IN PHARMACEUTICAL SCIENCES

Effect of honey mouth-care on xerostomia among semiconscious and unconscious patients

Sasmita Das[*], Sailabala Mohanty, Sonam Debnath

Department of Medical and Surgical Nursing, SUM Nursing College, Siksha 'O' Anusandhan (Deemed to be University), Bhubaneswar 751003, Odisha, India

ABSTRACT

A quasi-experimental study was conducted to find out the effect of honey mouth-care on xerostomia among semiconscious and unconscious patients in a selected hospital of Odisha. In this study, an experimental research approach and non-randomized control group design were adopted. 40 patients were selected by the non-probability purposive sampling technique and who met the inclusion criteria were selected for the study. A self-structured interview schedule and record analysis performa were used for collecting socio-demographic data. The Challacombe Scale was used to assess the level xerostomia among the selected patients. In unpaired 't' test, there was a significant difference between the level of xerostomia among the experimental group and control group as 't' value was -6.03 (p<0.0001), which represented that honey mouth-care was effective in reducing the level of xerostomia. In paired 't' test, there was a significant difference between the level of xerostomia in pre-test and post-test score among the experimental group as 't' value was -6.45 (p<0.0001) which represented that honey mouth-care was effective in reducing the level of xerostomia. The chi-square association between levels of xerostomia with selected demographic variables revealed that there was a significant association between the level of xerostomia with age and history of the previous hospitalization. No significant association found between the level of xerostomia with the socio-demographic data and the duration of semiconsciousness or unconsciousness and duration of xerostomia. The findings of the study revealed that honey-mouth-care was highly effective in reducing xerostomia among semiconscious and unconscious clients.

[*]Corresponding Author

Name: Sasmita Das
Phone:
Email: das.sasmita2@gmail.com

INTRODUCTION

Saliva plays a vital role in human metabolism and in maintaining oral health. It protects from microorganisms, facilitates the transportation of nutrients and digestive enzymes, lubrication of the oral cavity, remineralization of teeth, as well as aiding in chewing, swallowing and speech (Tiwari, 2011). A healthy person produces 1.5 liters of saliva a day, slowing to virtually no flow at around 4 am in a normal sleeping pattern; therefore, people can often wake to feel the need to drink water. However, salivary gland dysfunction and xerostomia are the two major factors concerning to saliva and its adverse effect on oral health (Wolff *et al.*, 2017).

Xerostomia in aging persons is a longstanding problem. Inveterate drying of the oral cavity can have an adverse effect on the use of dentures and the digestion of food. The reduced flow of saliva can lead to loss of the ability to taste, chewing, swallowing, and speech along with the risk of tooth decay, sensitivity and infections. Complications arising because of dry mouth can disturb a patient's health and diet (Villa and Abati, 2011; Villa *et al.*, 2014). Xerostomia can be caused due to toxicity from chemotherapy, head and neck radiotherapy, improper medications, autoimmune disorders or because of systemic diseases like diabetes, microbial infections, and hormonal disorder. As reported, improper drug administration is responsible for dry mouth in 75% of people suffering from xerostomia. Frequently used drugs like anti-depressants and antihistamine are widely ordained, which are largely responsible for dryness of the oral cavity. Most old-age and elderly people under these medications are suffering from a dry mouth and its complications (López-Pintor *et al.*, 2016; Lima *et al.*, 2017).

Honey is one of the most valuable natural products used by humankind since time immemorial. Honey is used as traditional medicine as well as a nutritional product. Moreover, honey is also used in the treatment of several other ailments like throat infections, eye diseases, fatigue, tuberculosis, thirst, hiccups, dizziness, healing of ulcers and wounds, hepatitis, eczema, bronchial asthma, constipation, worm infestation and piles (Samarghandian *et al.*, 2017). The components of honey have also been reported to have moisturizing, anti-inflammatory antioxidant, antiproliferative, antimicrobial, antimetastatic and anticancer effects. As reported, honey is also used for the control and treatment of diabetes, cancer, cardiovascular, neurological, and gastrointestinal diseases. Sufficient evidence exists in medical literature recommending and validating the use of honey as a therapeutic natural product (Meo *et al.*, 2017; Miguel *et al.*, 2017).

In this study, the level of xerostomia among semiconscious and unconscious patients was assessed along with the association between levels of xerostomia with selected demographic variables. Further, the therapeutic effect of honey mouth-care on xerostomia among these semiconscious and unconscious patients was also studied.

METHODOLOGY

Study Design

A quasi-experimental design (non-randomized control group design) was adopted to achieve the above-mentioned objectives. The study was conducted in the Neurosurgery Department of SCB Medical College and Hospital, Cuttack. The selected population consisted of all the semiconscious and unconscious patients with xerostomia. The sample size was 40 semiconscious and unconscious patients with xerostomia. Figure 1 shows the data of 20 patients of the experimental group and Figure 2 shows the data of 20 patients of the control group, where the non-probability purposive sampling technique was used. The inclusion criteria were both male and female patients, GCS score of the patients less than 12, the willingness of family members of the patient to participate and the patients who were present during the period of data collection. Similarly, the exclusion criteria were the patient with a GCS score of more than 12, the patients under age group of less than 18 and the patient whose family members were not interested in participating in the study.

Description of Data Collection Instruments

Tool A

Tool A consisted of 2 sections, as follows,

Section 1

A **s**elf-structured interview was conducted to obtain socio-demographic data of the patients. This section comprised of 5 items on socio-demographic profile including age, gender, educational qualification, occupation and history of the previous hospitalization.

Section 2

A record analysis was performed regarding demographic data. This section comprised of 4 items and 2 sub items on socio-demographic profile. They were: duration of semi-consciousness or unconsciousness, duration of xerostomia, use of mouthwash, if yes, number of mouth-care per day, client on ventilator-support, if yes, duration of ventilation.

Tool B

Standardized rating scale basing on "The Challacombe Scale" was done for the assessment of xerostomia (Challacombe *et al.*, 2015). This standardized rating scale provided an assessment of xerostomia among semiconscious and unconscious patients.

Score analysis

The Challacombe Scale consisted of a total score of 10. The maximum score was 10, whereas the minimum score was 1. In this scaled score, 1-3 indicated mild xerostomia, score 4-6 indicated moderate xerostomia and score 7-10 indicated severe xerostomia.

Ethical Consideration

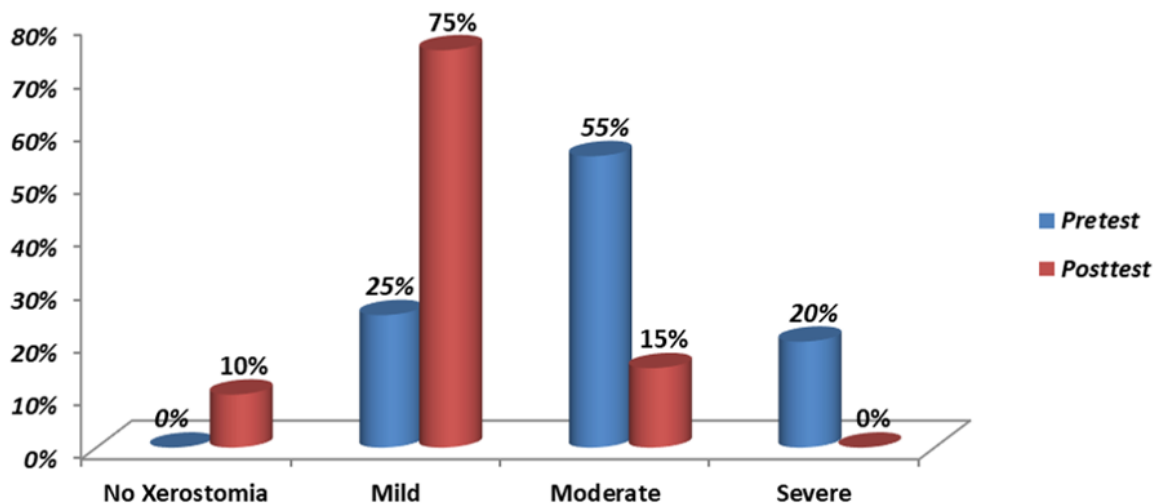Prior approval of the institutional ethical board was

Figure 1: Pretest and posttest level of xerostomia among the experimental group, n= 20
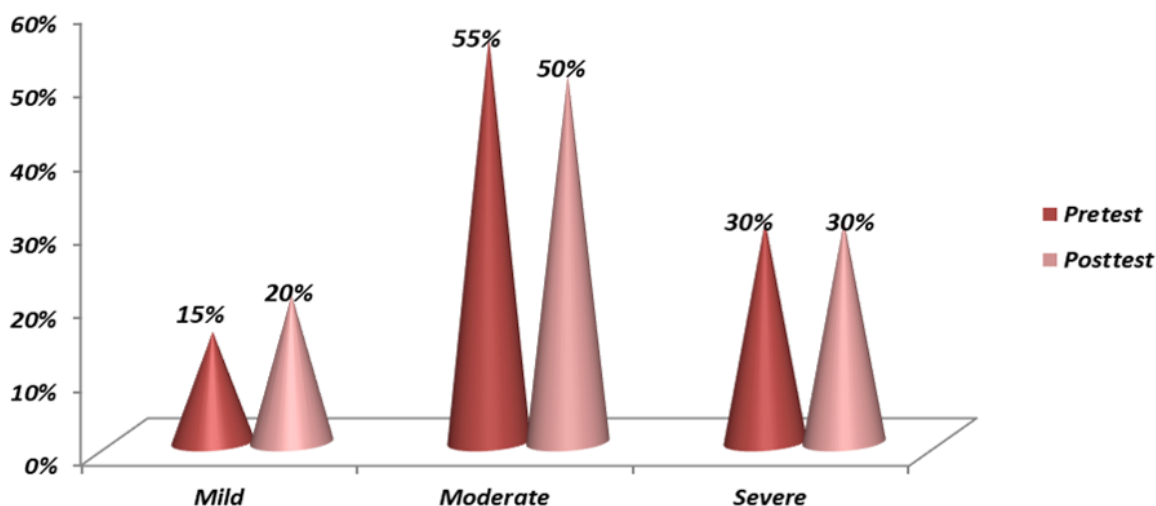

Figure 2: Pretest and posttest level of xerostomia among the control group, n= 20

taken before conducting the study. Informed consent was obtained from concerned family members of study participants. The confidentiality of the patients was ensured.

RESULTS AND DISCUSSION

Section-A

Description of a sample according to socio-demographic variables as per self-structured interview schedule and record analysis performa by using frequency and percentage.

A total of 37.5% of patients were in the age group of over 60 years, 75% were female, 27.5% were educated up to high school/H.S. level and 27.5% were educated up to graduate/P.G. level, 25% were businessman, 45% were in others occupation (Table 1). Distribution of subjects according to

duration of semiconsciousness or unconsciousness depicts maximum number of sample, i.e., 57.5% of the patients were semiconscious or unconscious since 1-10 days, 22.5% of the patients had xerostomia since 1-3 days, 22.5% of the patients had xerostomia since 4-6 days,72.5% of the patients were using mouthwash, 68.96% of the patients were getting mouth-care less than 2 times a day,60% of the patients were ventilated and 40% of the patients were not ventilated, 41.66% were ventilated since 7-10 days (Table 2).

Section-B

Description of a sample according to pre-test and post-test level of xerostomia among experimental and control groups.

The distribution of samples according to pre-test and post-test level of xerostomia among the experi-

mental group depicts 25% of the patients in the pre-test had mild xerostomia, 55% had moderate xerostomia and 20% had severe xerostomia. But after the intervention (in post-test), 10% of the patients had no xerostomia, 75% had mild xerostomia, and 15% had moderate xerostomia and no patients had severe xerostomia. Similarly, the distribution of samples according to pre-test and post-test level of xerostomia among the control group depicts 15% of the patients in the pre-test had mild xerostomia, 55% of the patients had moderate xerostomia and 30% had severe xerostomia. And in the post-test, 20% of the patients had mild xerostomia and 50% had moderate xerostomia and 30% had severe xerostomia.

Section-C

Description of the sample according to the findings related to the effect of honey mouth-care on xerostomia among semiconscious and unconscious patients.

The difference values in terms of mean, standard deviation and value of significance after the 't' test was highlighted in Table 3. It was recorded that the calculated 't' value was -1.50 (DF =38) and 'p' value was 0.14, i.e., there was no significant difference between the level of xerostomia among experimental group and control group. Hence the null hypothesis ($H0_1$) was accepted and the research hypothesis (H_1) was rejected. Similarly, Table 4 highlights the different values in terms of mean, standard deviation and value of significance after 't' test. It depicts that the calculated 't' value was -6.03 (df=38) and 'p' value was <0.0001, i.e., there was a significant difference between the level of xerostomia among experimental group and control group which indicate honey mouth-care was effective in reducing the level of xerostomia. Hence the null hypothesis ($H0_1$) was rejected and the research hypothesis (H_1) was accepted.

The calculated 't' value was -6.45 (df=19) and 'p' value was <0.0001, i.e., there was a significant difference between the level of xerostomia in pre-test and post-test score among the experimental group which indicates honey mouth-care was effective in reducing the level of xerostomia (Table 5). Hence the null hypothesis ($H0_1$) was rejected and the research hypothesis (H_1) was accepted. However, in Table 6, the calculated 't' value was -1.45 (DF=19) and 'p' value was 0.16 i.e., there was no significant difference between pre-test and a post-test score of xerostomia in control group which indicate there was a significant difference between the level of xerostomia among experimental group and control group. Hence the null hypothesis ($H0_1$) was rejected and

the research hypothesis (H_1) was accepted.

Section-D

Chi-square analysis to find out the association between the levels of xerostomia with selected demographic variables,

The findings showed that there was a significant association between the level of xerostomia with age and history of the previous hospitalization.

For the routine evaluation of hyposalivation and obtaining reliable results, a clinical dryness score (CODS) method was developed based on clinical symptoms. The continuous flow of saliva and the thickness of the mucin layer over epithelium (mucosal wetness) are associated directly with CODS, indicating a physiological basis to the feeling of dryness in the oral cavity. CODS should be included as a routine diagnostic method for any oral cavity problem. In general, a COD score between 1 to 3 indicates mild dryness, which is manageable. However, if the score is between 4 to 10, the patient should be referred for further diagnosis. Another scale named 'bother index' has been developed to related CODS and hyposalivation (Challacombe et al., 2015).

Samaranayake et al. (2008) in 1995 conducted a retrospective study on prevalence pf complications and oral diseases in the long-term hospitalized elderly patients in their oral cavity. As recorded, 65% of the total patients were 80 years olf or more and most of was mentally unstable; among 80 patients, xerostomia was recorded in 35% and denture-related problems in 45% elderly patients. The coated tongue was recorded in 56% of patients, 25% recorded Angular cheilitis, and 19% of patients had Candida-associated denture stomatitis. No cases of ulcers were recored (Samaranayake et al., 2008).

Thomson et al. (2006) conducted a study with patients suffering from xerostomia in 2006 and stated that there was a significant increase in prevalence the rate of xerostomia, from 21.4 % to 24.8 %, between the fifth and eleventh year of their follow up. However, in 25% of those patients, the severity of xerostomia was found fluctuating over the study period. The use of different medications was recognized as the primary reason for xerostomia in these patients. Xerostomia incidence was found higher among the patients taking diuretics, NSAIDs, antidepressants or aspirin (Thomson et al., 2006).

A comparative study was conducted in Nellore, India, among patients with ulcers in a selected hospital in order to evaluate the efficacy of honey application against betadine dressing on wound healing. From a total of 60 selected patients, the honey dress-

Table 1: Frequency and percentage distribution of subjects according to socio-demographic variables as per the self-structured interview schedule

Sl. No	Item	Characteristics	Frequency(f)	Percentage (%) (n=40)
1.	Age (in Years)	20-30	6	15
		31-40	7	17.5
		41-50	6	15
		51-60	6	15
		>60	15	37.5
2.	Gender	Male	30	75
		Female	10	25
3.	Educational Qualification	Illiterate	10	25
		Primary	8	20
		High School/H.S.	11	27.5
		Graduate/P.G.	11	27.5
4.	Occupation	Govt. Employee	5	12.5
		Private Employee	7	17.5
		Business	10	25
		Others	18	45
5.	H/O Previous Hospitalization	Yes	19	47.5
		No	21	52.5

Table 2: Frequency and percentage distribution of subjects according to socio-demographic variables as per record analysis performa

Sl. No	Item	Characteristics	Frequency(f)	Percentage(%)(n=40)
1.	Duration of semiconsciousness unconsciousness (Days)	1-10	23	57.5
		11-20	11	27.5
		21-30	6	15
		>30	Nil	-
2.	Duration of xerostomia (Days)	1-3	9	22.5
		4-6	9	22.5
		7-10	12	30
		>10	10	25
3.	Use of mouthwash	Yes	29	72.5
		No	11	27.5
	If yes, no. of mouthcare per day.	<2 times	20	68.96
		2 times	6	20.68
		3 times	3	10.34
		>3 times	Nil	-
4.	Client on ventilatory support	Yes	24	60
		No	16	40
	If yes, duration of ventilation (Days)	1-3	7	29.16
		4-6	3	12.5
		7-10	10	41.66
		>10	4	16.66

Table 3: Unpaired 't' test to compare the pretest score of xerostomia among the experimental group and the control group

Research Groups	Mean±SD	t – value	p – value (N=(n$_1$+n$_2$) =40)
Experimental Group(n1)	4.6±1.53	-1.50	0.14
Control Group(n2)	5.4±1.81		

$*p \leq 0.05$

Table 4: Unpaired 't' test to compare the post-test score of xerostomia among the experimental group and the control group

Research Groups	Mean±SD	t - value	p – value (N=(n$_1$+n$_2$)=40)
Experimental Group(n1)	2.1±1.51	-6.03	<0.0001*
Control Group(n2)	5.3±1.83		

$*p \leq 0.05$

Table 5: Paired 't' test to compare pretest and post-test scores of xerostomia among the experimental group

Experimental Group	Mean±SD	t – value	p – value (n=20)
Pre-test	4.6±1.53	-6.45	<0.0001*
Post-test	2.1±1.51		

$*p \leq 0.05$

Table 6: Paired 't' test to compare pretest and post-test scores of xerostomia among the control group

Control Group	Mean±SD	t – value	p – value (n=20)
Pretest	5.4±1.81	-1.45	0.16
Posttest	5.3±1.83		

$*p \leq 0.05$

ing was done for 30 patients and for the rest 30, betadine dressing was done once in a day for 7 days. By using Jensen wound assessment tool, the wound healing capacity of honey and betadine was evaluated. Honey was recorded to have better on wound healing capacity in comparison to betadine dressing (Latha and Jyothsna, 2014).

A study conducted to assess the effectivity of honey on children with acute cough. As reported, honey had better therapeutic value than 'no treatment' and other cough syrups like placebo (a liquid that looks like and taste like honey, but is not honey) for cough relief. Honey is considered to a good natural replacement for cough syrups (Oduwole *et al.*, 2012).

CONCLUSIONS

In this study, findings described that honey mouth-care was effective in reducing the level of xerostomia in the selected semiconscious and unconscious patients. There was a significant association between the level of xerostomia with age and the history of the previous hospitalization. The implication of honey mouth-care in the medical and nursing profession would be helpful in reducing xerostomia among patients.

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