



**International Journal of Biology, Pharmacy
and Allied Sciences (IJBPAS)**

'A Bridge Between Laboratory and Reader'

www.ijbpas.com

CHLORHEXIDINE AND SALINE ON ORAL MUCOSITIS AMONG CANCER PATIENTS

PRAKASH D^{1*} AND RESHMI S²

1: PhD Scholar, Mansarovar Global University, Bhopal- 462042, Madhya Pradesh, India

2: Research Supervisor, Mansarovar Global University, Bhopal- 462042, Madhya Pradesh,
India

***Corresponding Author: Dr. Prakash D: E Mail: pd.fn@spu.ac.in**

Received 16th Jan. 2024; Revised 20th Feb. 2024; Accepted 13th July 2024; Available online 1st May 2025

<https://doi.org/10.31032/IJBPAS/2025/14.5.8997>

ABSTRACT

Oral mucositis is arguably the most prevalent and crippling side effect of cancer treatments, especially chemotherapy and radiation. It can cause a number of issues, such as pain, nutritional deficiencies from not being able to eat, and an increased risk of infection from open sores in the mucosa. It can also be dose-limiting. The study's objective was to evaluate the effects of saline and chlorhexidine on oral mucositis. Non-randomized comparative research design was used as the study's research method. A sample of sixty patients with oral mucositis who met the inclusion criteria was obtained using non-probabilistic judgmental sampling approaches. The WHO oral mucositis scale was used for both the pre- and post-test. Experiment I was told to rinse their mouth with chlorhexidine after the pre-test, while experimental group II was told to use saline mouthwash. In experimental group I pre test mean 2.86 (SD 0.8695) and the post test mean was 0.52 (SD 0.3642), the paired 't' value was 5.8607. In experimental group II pre test mean 2.98 (SD 0.7532) and the post test mean was 0.89 (SD 0.4215), the paired 't' value was 4.4071. Unpaired 't' value 2.0058 which is significant at $P < 0.05$ level. The results showed that when it came to lowering the degree of oral mucositis in cancer patients, chlorhexidine outperformed saline. Chi

square analysis revealed that, with the exception of length of illness and frequency of mouth care, there was no significant correlation between the clinical and demographic characteristics of cancer patients with oral mucositis in experimental groups I and II.

Key words: Chlorhexidine, Saline, Oral, Mucositis, Cancer, Patients

INTRODUCTION:

One in six fatalities globally is caused by the global health issue of cancer. The method of treating cancer has always been very intricate. While major advancements in treatment are being made recently, chemotherapy, radiation therapy, stem cell therapy, targeted therapy, ablation therapy, natural antioxidants are among the conventional approaches that have been used [1].

The term "oral mucositis" describes the erythematous and ulcerative lesions of the oral mucosa seen in cancer patients receiving radiation therapy to the oral cavity as well as chemotherapy. Oral mucositis lesions can be extremely painful, impair diet and dental hygiene, and raise the risk of both local and systemic infection. Other parts of the digestive system can also be affected by mucositis; for instance, diarrhoea may be a symptom of gastrointestinal mucositis. As a result, mucositis is a very important side effect of cancer treatment that might occasionally limit dosage [2].

Approximately 400,000 cases of treatment-induced oral cavity injury occur each year [3]. According to one study, 303 out of 599

individuals who had chemotherapy for lymphoma or solid tumors also experienced gastrointestinal and oral mucositis. Of the 1236 chemotherapy cycles, oral mucositis developed in 22% of the cycles, gastrointestinal mucositis in 7% of the cycles, and combined oral and gastrointestinal mucositis in 8% of the cycles. When high-dose chemotherapy is administered before hematopoietic cell transplantation, an even larger proportion of patients experience clinically severe oral mucositis.

Patients with mouth cavity and nasopharyngeal cancer may benefit from the straightforward home-based oral care routine this study describes in order to alleviate traumatic oral mucositis. It is advised that medical personnel support patients in maintaining appropriate oral hygiene even after radiation treatment is finished in order to sustain the beneficial effects until the mucositis has subsided [4].

According to a study by Shih A *et al.*, mouthwash with a bland taste, like saline or sodium bicarbonate rinse, can reduce the number of oral microbial flora. The best

treatments for oral mucositis include dental care, routine oral examinations, and starting a standardised oral hygiene regimen before starting cancer treatment [5].

According to research done by Ferretti GA *et al.*, individuals receiving bone marrow transplantation have lower rates of oral soft tissue disease and oral microbial burden when they use chlorhexidine mouthrinse. For patients receiving bone marrow transplantation, the preventive chlorhexidine mouthrinse treatment has been shown to significantly reduce mucositis and oral candida infections [6].

Comparing the effects of chlorhexidine and saline on the healing process of radiation and chemotherapy-induced oral mucositis piqued my interest. As a result, I went with chlorhexidine and saline because they are easily accessible, reasonably priced, and have positive health effects.

MATERIALS AND METHODS:

The effects of saline and chlorhexidine on oral mucositis in cancer patients were evaluated using a quasi-experimental, non-randomized comparative research design. Sixty oral mucositis samples from ahmedabad civil hospital, obtained using non-probability judgmental sampling, satisfied the inclusion criteria. Following verbal research information and their consent, a random

selection process was used. Demographic data on age, education, religion, duration of illness, eating habits, dietary habit, smoking habit, habit of alcoholism, family history and frequency of mouth care were gathered through a methodical interview schedule. The world health organization oral mucositis scale, which is used to assess oral mucositis in cancer patients, was utilised for the pre-test. intervention group 1 was asked to rinse with chlorhexidine four times a day for five days after the pre-test, and intervention group 2 was instructed to rinse with saline mouthwash four times a day for five days. After five days, the degree of oral mucositis was measured using the same world health organization scale. The analysis was calculated manually by the researcher using descriptive and inferential statistics.

RESULTS:

The majority of participants in the pretest were in Stage 4 (58%), followed by Stage 3 (22%), Stage 2 (14%), and Stage 1 (11%), which shows the frequency and percentage distribution of oral mucositis in intervention group 1. In post-test findings, on the other hand, indicated that 85% people were in normal, 7% were in stage 1, 5% were in stage 2, 1% were in stage 3, and 1% were in stage 4 as shown in **Figure 1**.

The majority of participants in the pretest were 63% in stage 4, 17% in stage 3, 14% in stage 2, and 6% in stage 1, which shows the frequency and percentage distribution of oral mucositis in intervention group 1. In post-test findings, on the other hand, indicated that the 80% patient was in normal, 8% was in stage 1, 7% was in stage 2, 4% was in stage 3, and 1% was in stage 4 as can be seen in **Figure 2**.

The average pre-test score was 2.86 (standard deviation 0.8695) and the average post-test score was 0.52 (standard deviation 0.3642). The paired "t" value of 5.8607 indicates that there is a significant difference between the oral mucositis pre- and post-test scores among cancer patients in intervention group 1. It demonstrates that using chlorhexidine can effectively lower the degree

of oral mucositis in cancer patients. The paired "t" value for the intervention group 2 was 4.4071, the post test mean was 0.89 (standard deviation 0.4215) and pre test mean was 2.98 (standard deviation 0.4215) according to **Table 1**. This demonstrates that chlorhexidine was more successful in lowering levels of oral mucositis than saline among cancer samples.

Table 2 shows that there was no association between post test level of oral mucositis with selected demographic and clinical variable except duration of illness and frequency of mouth care.

Table 3 shows that there was no association between post test level of oral mucositis with selected demographic and clinical variable except duration of illness and frequency of mouth care.

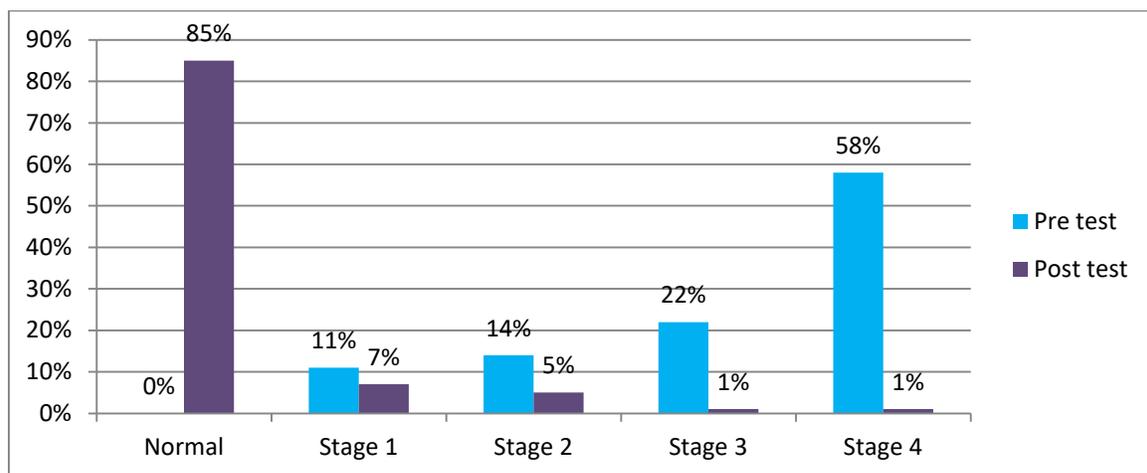


Figure 1: Frequency and percentage distribution of oral mucositis in intervention group 1

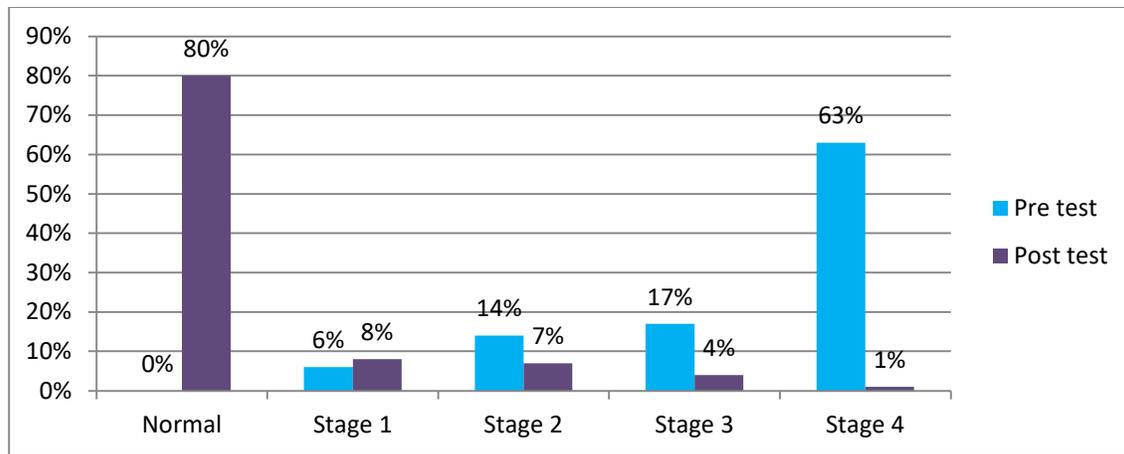


Figure 2: Frequency and percentage distribution of oral mucositis in intervention group 2

Table 1: Comparison of the pre and post test scores of level of oral mucositis among cancer patients

Group	test	Mean	SD	't' value	Table value	Inference
Experimental group 1	Pre test	2.86	0.8695	5.8607	2.045	Significant
	Post test	0.52	0.3642			
Experimental group 2	Pre test	2.98	0.7532	4.4071	2.045	significant
	Post test	0.89	0.4215			

Table 2: Association between post test levels of oral mucositis with their selected demographic variables in intervention group 1

S. No	Demographic variables		Frequency				Chi Square Value	Table value	Inference
			Normal	Stage I	Stage II	Stage III			
1	Age	25-30	1	0	2	0	1.84	2.262	NS
		30-35	2	1	3	1			
		35-40	2	6	2	2			
		Above 40	0	2	3	3			
2	Education	No-formal education	0	2	1	1	1.65	2.262	NS
		Primary to high school	2	3	3	3			
		Higher secondary school	1	2	3	2			
		Graduate	0	4	2	1			
3	Duration of illness	7 days	0	1	2	1	6.993	2.262	S
		8-14 days	2	7	3	2			
		15-21 days	2	3	1	0			
		More than 21 days	1	2	1	2			
4	Religion	Hindu	7	6	8	6	2.136	2.262	NS
		Muslim	0	1	1	1			
		Christian	0	0	0	0			
		Others	0	0	0	0			
5	Dietary habit	Vegetarian	6	7	6	8	2.0732	3.182	NS
		Mixed vegetarian	1	0	1	1			
6	Smoking habit	Yes	4	3	3	4	2.5265	3.182	NS
		No	3	10	3	10			
7	Habit of alcoholism	Yes	1	1	1	1	2.296	3.182	NS
		No	3	10	3	10			
8	Family history	History	5	10	3	4	1.2669	3.182	NS
		No history	2	3	1	2			
9	Frequency of mouth care	2 times a day	3	10	8	5	9.125	3.182	S
		1 time a day	3	1	0	0			

S-Significant NS-Non significant

Table 3: Association between post test levels of blood glucose level with their selected demographic variables in intervention group 2

S. No	Demographic variables		Frequency				Chi Square Value	Table value	Inference
			Normal	Stage I	Stage II	Stage III			
1	Age	25-30	0	1	0	1	4.396	2.262	NS
		30-35	1	2	2	1			
		35-40	3	3	4	4			
		Above 40	1	2	3	2			
2	Education	No-formal education	0	1	1	1	2.1336	2.262	NS
		Primary to high school	2	3	3	4			
		Higher secondary school	1	3	4	2			
		Graduate	1	2	1	1			
3	Duration of illness	7 days	1	2	1	1	8.4347	2.262	S
		8-14 days	2	3	5	2			
		15-21 days	1	3	2	1			
		More than 21 days	1	1	2	2			
4	Religion	Hindu	7	5	8	7	1.2403	2.262	NS
		Muslim	0	1	1	1			
		Christian	0	0	0	0			
		Others	0	0	0	0			
5	Dietary habit	Vegetarian	7	10	6	4	2.693	3.182	NS
		Mixed vegetarian	0	2	0	1			
6	Smoking habit	Yes	0	8	2	2	2.52	3.182	NS
		No	6	2	5	5			
7	Habit of alcoholism	Yes	0	1	4	1	2.3712	3.182	NS
		No	10	4	7	3			
8	Family history	History	3	5	6	4	2.717	3.182	NS
		No history	7	1	2	2			
9	Frequency of mouth care	2 times a day	5	10	7	3	5.524	3.182	S
		1 time a day	0	2	2	1			

S-Significant NS-Non significant

DISCUSSION:

According to current research study the average pre-test score was 2.86 and post-test score was 0.52. The paired "t" value of 5.8607 in intervention group 1. The paired "t" value for the intervention group was 4.4071, and the pre test mean score was 2.98, post test mean was 0.89. This demonstrates that chlorhexidine was more successful in lowering levels of oral mucositis than saline among cancer patients.

According to a study by Sant Ana G *et al.*, topical medications are a good substitute for at-home care when it comes to pain management, inflammation reduction, and the ensuing improvement in quality of life in patients with severe oral mucositis lesions undergoing chemoradiotherapy [7]. According to Huang BS *et al.*, patients with oral cavity cancer undergoing radiation therapy and concurrent chemotherapy benefit from a better physical and social-emotional

quality of life when they rinse with saline and participate in educational programmes [8].

The research findings of Dodd MJ *et al.*, offer crucial clinical information about the cost analysis of managing radiation treatment mucositis. Using salt & soda instead of micronized sucralfate is wise and economical because there isn't a noticeable difference in efficacy between the two [9]. In a study involving 76 patients who finished the study, Madan PD *et al.* discovered that after the first week of radiation therapy, participants in the povidone-iodine group scored significantly lower on mucositis than those in the control group. Additionally, their ratings were considerably lower in the fourth and fifth week following radiotherapy compared to the salt/soda and chlorhexidine groups, respectively [10].

According to a research study by Feber T *et al.*, the group that received saline rinses seemed to perform better than the group that received hydrogen peroxide on certain outcomes. This implies that regular mechanical mouthwashing may be more significant than a mouthwash's antibacterial qualities. Radiation mucositis patients may not want to use antiseptic mouthwashes. To ascertain optimal methods for managing mucositis, multi-center, interdisciplinary trials ought to be carried out [11]. According

to studies by Askarifar M *et al.*, cryotherapy is superior than saline mouthwash in terms of lessening the severity of mucositis. She suggested using this technique to avoid mucositis after bone marrow transplantation [12].

According to studies by Dodd MJ *al.*, while all mouthwashes were equally effective, the least expensive one was the salt and soda mouthwash [13]. A study by Foote RL *et al.* suggested that individuals undergoing radiation therapy to the oral mucosa would benefit from using a mouthwash containing chlorhexidine. Strong evidence from this study suggests that using a mouthwash containing chlorhexidine in this clinical setting is not beneficial [14].

Afrasiabifar A *et al.*, research study tells that Chlorhexidine mouthwash and the grape vinegar and rose water solution decreased chemotherapy-induced oral mucositis. The therapeutic property of the grape vinegar and rose water solution was similar to that of chlorhexidine mouthwash in treating oral mucositis [15]. Sorensen JB *et al* conducted research study and it revealed that the frequency and duration of oral mucositis are significantly improved by prophylactic chlorhexidine and by cryotherapy [16].

CONCLUSION:

Saline and chlorhexidine were applied topically. Patients treated with turmeric and honey had reduced ulcerative area, erythema intensity, pain, and degree of mucositis. Based on available evidence, chlorhexidine rinses were found to be more effective than saline rinses in treating symptoms of oral mucositis. Thus, more investigation is required to confirm the fascinating effect of saline and chlorhexidine on inflammatory oral lesions.

REFERENCE:

- [1] Debela, DT *et al.*, (2021). New approaches and procedures for cancer treatment, SAGE Open Med, 2021, 9. doi: 10.1177/20503121211034366.
- [2] Lalla, RV *et al.*, (2008). Management of oral mucositis in patients who have cancer, Dent Clin North Am, 52(1):61-77. doi: 10.1016/j.cden.2007.10.002.
- [3] Naidu, MU *et al.*, (2004). Chemotherapy-induced and/or radiation therapy-induced oral mucositis--complicating the treatment of cancer, Neoplasia, 6(5):423-31. doi: 10.1593/neo.04169.
- [4] Lin, YW *et al.*, (2022). Effect of a Simple Home-Based Oral Care Regimen on Oral Mucositis in Patients With Oral Cavity and Nasopharyngeal Cancer, Hu Li Za Zhi, 69(4):52-63. doi: 10.6224/JN.202208_69(4).08.
- [5] Shih, A *et al.*, (2002). A research review of the current treatments for radiation-induced oral mucositis in patients with head and neck cancer, Oncol Nurs Forum, 29(7):1063-80. doi: 10.1188/02.ONF.1063-1080.
- [6] Ferretti, GA *et al.*, (1988). Control of oral mucositis and candidiasis in marrow transplantation: a prospective, double-blind trial of chlorhexidine digluconate oral rinse, Bone Marrow Transplant, 3(5):483-93. PMID: 3056555.
- [7] Sant, AG *et al.*, (2020) Topical Treatment of Oral Mucositis in Cancer Patients, Asian Pac J Cancer Prev, 21(7):1851-1866. doi: 10.31557/APJCP.2020.21.7.1851.
- [8] Huang, BS *et al.*, (2018). The effectiveness of a saline mouth rinse regimen and education programme on radiation-induced oral mucositis and quality of life in oral cavity cancer patients, Eur J Cancer Care, 27(2):e12819. doi: 10.1111/ecc.12819.
- [9] Dodd, MJ *et al.* (2003). Radiation-induced mucositis: a randomized clinical trial of micronized sucralfate

- versus salt & soda mouthwashes, *Cancer Invest.* 21(1):21-33. doi: 10.1081/cnv-120016400.
- [10] Madan, PD *et al.*, (2008). The effect of three mouthwashes on radiation-induced oral mucositis in patients with head and neck malignancies, *J Cancer Res Ther.* 4(1):3-8. doi: 10.4103/0973-1482.39597.
- [11] Feber, T. (1996). Management of mucositis in oral irradiation, *Clin Oncol*, 8(2):106-11. doi: 10.1016/s0936-6555(96)80116-6.
- [12] Askarifar, M *et al.*, (2016). The Effects of Oral Cryotherapy on Chemotherapy-Induced Oral Mucositis in Patients Undergoing Autologous Transplantation of Blood Stem Cells: A Clinical Trial, *Iran Red Crescent Med J*, 18(4):e24775. doi: 10.5812/ircmj.24775. PMID: 27257512.
- [13] Dodd, MJ *et al.*, (2000). Randomized clinical trial of the effectiveness of 3 commonly used mouthwashes to treat chemotherapy-induced mucositis, *Oral Surg Oral Med Oral Pathol Oral Radiol Endod*, 90(1):39-47. doi: 10.1067/moe.2000.105713.
- [14] Foote, RL *et al.*, (1994), Randomized trial of a chlorhexidine mouthwash for alleviation of radiation-induced mucositis, *J Clin Oncol*, 12(12):2630-3. doi: 10.1200/JCO.1994.12.12.2630.
- [15] Afrasiabifar, A *et al.*, (2020). Oral Mucositis: Examining the Combined Solution of Grape Vinegar and Rose Water Versus Chlorhexidine Mouthwash, *Clin J Oncol Nurs*, 24(6):E71-E78. doi: 10.1188/20.CJON.E71-E78.
- [16] Sorensen, JB *et al.*, (2008). Double-blind, placebo-controlled, randomized study of chlorhexidine prophylaxis for 5-fluorouracil-based chemotherapy-induced oral mucositis with nonblinded randomized comparison to oral cooling (cryotherapy) in gastrointestinal malignancies, *Int J Radiat Oncol Biol Phys*, 112(7):1600-6. doi: 10.1002/cncr.23328.