A study to compare the effectiveness of povidone Iodine mouthwash vs Chlorhexidine mouthwash among cancer patients.

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ABSTRACT

Background:

Cancer continues to be one of the leading causes of morbidity and mortality across the globe. Advances in cancer treatment—such as surgery, radiotherapy, chemotherapy, targeted therapy, and immunotherapy—have significantly improved survival rates, yet these treatments often lead to a range of adverse effects. Among them, oral complications are some of the most common and debilitating, especially in patients undergoing chemotherapy and radiotherapy. Chlorhexidine mouthwash is widely used as a standard oral antiseptic due to its broad-spectrum antimicrobial properties. However, its side effects—such as tooth discoloration, altered taste, mucosal irritation, and reduced patient acceptance—limit its long-term use. Povidone-iodine, another commonly used antiseptic agent, offers broad antiviral, antibacterial, and antifungal activity and may be a suitable alternative, particularly for immunocompromised patients. However, the studies related to the effectiveness of chlorhexidine mouthwash vs povidone iodine mouthwash are limited.

Materials and Methods:

A randomized controlled trial (RCT) was conducted to compare the effectiveness of chlorhexidine and povidone-iodine mouthwash in cancer patients undergoing chemotherapy and/or radiotherapy. A prospective observational study was conducted among cancer subjects who underwent radiation or chemotherapy in Apollo Hospitals International Limited, Gandhinagar. Fifty cancer patients were selected by purposive sampling technique. The patients were aged in the range of 25 to above 65 years. The WHO oral care assessment tool was adopted to assess the severity of mucositis and other oral complications. 10ml of diluted povidone iodine mouthwash was given to experimental group I, while 10 ml of diluted chlorhexidine mouthwash was given to group II. Using the WHO Oral Assessment Tool, the level of oral complications in groups I and II was evaluated on the first, third, and fifth days.

Results:

Fifty cancer patients' results were analyzed, and it shows that out of 50 patients, patients between the ages of 40-65 (62%) were receiving chemotherapy. Experimental group 1 showed a mild level of mucositis. Whereas experimental group 2 demonstrated a moderate level of mucositis on the 5th day. The results of the study indicate that povidone iodine solution was significantly reducing oral complications compared to chlorhexidine solution.

Conclusion:

In the present study, it was observed that both mouthwashes were individually effective on oral complications, but the comparison revealed that povidone iodine mouthwash was more effective than chlorhexidine mouthwash at reducing complications.

Key word: Cancer, Povidone iodine and Chlorhexidine mouthwash.

Worldwide, cancer is one of the leading causes of death, accounting for nearly 10 million deaths in 2020. The number of new cases detected in 2025 was approximately 1,413,316. (1) There are distinguished treatment modalities available in the form of surgery, radiotherapy, chemotherapy, targeted therapy, and radiofrequency ablation. Many patients undergo single treatment, and in some cases, patients receive surgery with radiotherapy and chemotherapy. (2,3)

Cancer patients undergoing chemotherapy and/or radiotherapy often experience a range of oral complications, including oral mucositis, infections, and discomfort, due to immunosuppression and tissue damage. Chemotherapy-induced mucositis is typically caused by a low white blood cell count, while radiation-induced mucositis is typically produced by the necrotic and inflammatory effects of radiation energy on the oral mucosa. Oral mucositis, in particular, significantly impacts the quality of life, nutritional intake, and treatment adherence.

Chlorhexidine is commonly used as an oral antiseptic, known for its broad-spectrum antimicrobial activity. However, its side effects—such as tooth discoloration, altered taste, mucosal irritation, and reduced patient acceptance—limit its long-term use. (4) Povidone-iodine mouthwash is another antiseptic with antiviral, antibacterial, and antifungal properties and may serve as a viable alternative in this patient population. (5,6) Despite widespread use of chlorhexidine in oral care for cancer patients, there is limited high-quality comparative evidence on the effectiveness and tolerability of povidone-iodine in this context. (7) This study seeks to fill that gap by directly comparing both solutions. Given the clinical importance of maintaining optimal oral hygiene in cancer patients, a comparative evaluation of these two agents is warranted to determine the more effective and better-tolerated option for oral care. The objective of this study was to compare the effectiveness of povidone iodine mouthwash and chlorhexidine mouthwash in preventing and managing oral complications in cancer patients.

LITERATURE REVIEW:

I. Cancer research UK

II. National library for medicine

III. Pub med central

IV. Journal of oral and maxillofacial anaesthesia

V. Cancer street dental professionals

VI. Case studies

VII. Macmillan cancer Support-Mouth care after head and neck cancer treatment.

MATERIALS AND METHODS

A randomized controlled trial (RCT) was conducted to compare the effectiveness of chlorhexidine and povidone-iodine mouthwash in cancer patients undergoing chemotherapy and/or radiotherapy at Apollo Hospitals International Limited, Gandhinagar. The Institutional Ethics Committee approval was obtained. The study extended for the duration of 6 months, and the data collection period was three months.

INCLUSION CRITERIA

Adult patients (>18 years) diagnosed with oral cancer, undergoing chemotherapy and/or radiotherapy, able and willing to perform regular oral rinsing, and provided written informed consent were included in the study.

EXCLUSION CRITERIA

Pre-existing severe oral infections or mucositis at baseline, known allergy or sensitivity to povidone-iodine or chlorhexidine, or use of other antiseptic mouthwashes during the study period.

ETHICAL CONSIDERATIONS

The study protocol was submitted to the Institutional Ethics Committee (IEC) for approval prior to initiation. In order to proceed with the research study, prior permission was obtained from the Institutional Ethics Committee to conduct the research study. The ethical committee of Ahmedabad, Gujarat, has exempted some of the research from ethical approval, and hence ethical clearance and permission were exempted in the case of the present study. The purpose of the study was informed and explained to the selected patients.

INFORMED CONSENT:

Informed consent was obtained from the respondents after a proper explanation about the purpose and usefulness of the study, and assurance was given about the confidentiality of their responses.

CONFIDENTIALITY: Patient data was anonymized and stored securely. Only the research team will have access.

RIGHT TO WITHDRAW: Participants can withdraw from the study at any point without any impact on their medical care.

RISK-BENEFIT ASSESSMENT: Both mouthwashes are already in clinical use. Risks are minimal and outweighed by the potential benefits of improved oral care.

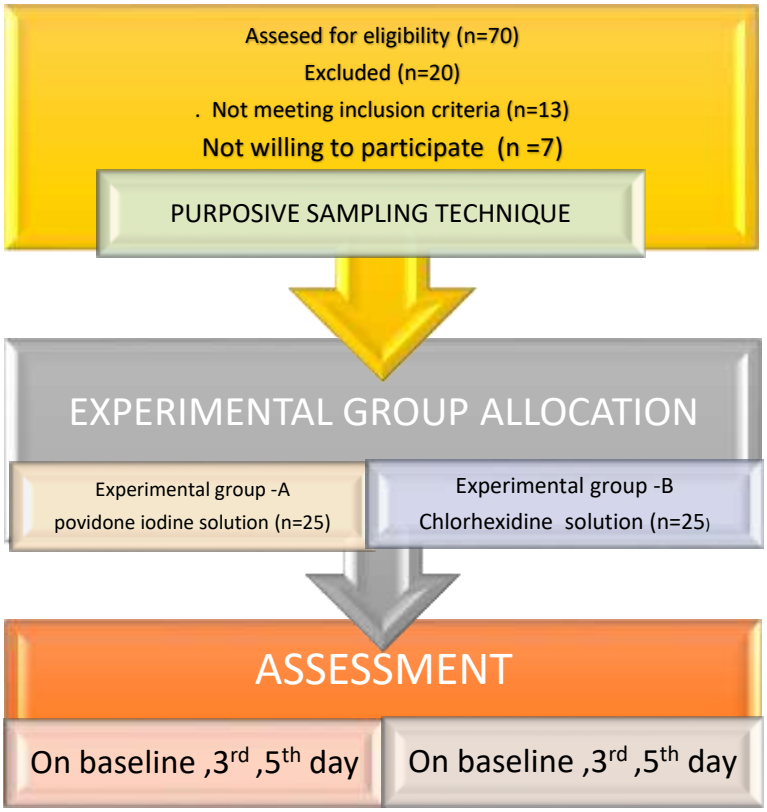
The period of data collection extended from 01/04/2025 to 30/08/2025. During the intervention, the researcher assessed the severity of the oral complications in group I and group II on the baseline (first day) and repeated it on the 3rd and 5th days using an oral assessment tool.

RANDOMIZATION AND GROUP ALLOCATION

50 cancer patients were selected by a purposive sampling technique. Out of the 50 participants, twenty-five were allocated to group I (Povidone Iodine mouthwash) and twenty-five to group II (Chlorhexidine mouthwash).
The researcher's clinical Performa and sociodemographic profile were used to evaluate the individuals' clinical and sociodemographic traits.

INTERVENTION

10 ml of Povidone Iodine mouthwash were given to experimental Group I, while 10 ml of Chlorhexidine mouthwash were given to experimental Group II. After diluting both mouthwashes with 10 ml of water, the oral cavity was gargled with the mixture for one minute, three times a day, for the five days.



DATA ANALYSIS

Demographic factors were recorded. Data that was filled into Microsoft Excel was validated. Statistical analysis was performed using the SPSS program. The Chi-Square test was used to measure the importance of categorical data. At 0.05%, the probability value is considered the significant level in each of the aforementioned statistical methods.

RESULTS:

In our research, the age distribution of the study group reveals that 7.5% of the patients belong to the 31-40-year age criteria, 17% are in the 41-50-year criteria, 29.7% fall within the 51-60-year range, and 45.8% are above 60 years old. Regarding gender distribution, over three-quarters (66.7%) of the patients are male, while the remaining (33.3%) are female. Among the 50 patients selected, 28 patients demonstrated mild oral mucositis, and 12 patients demonstrated moderate-level oral mucositis.

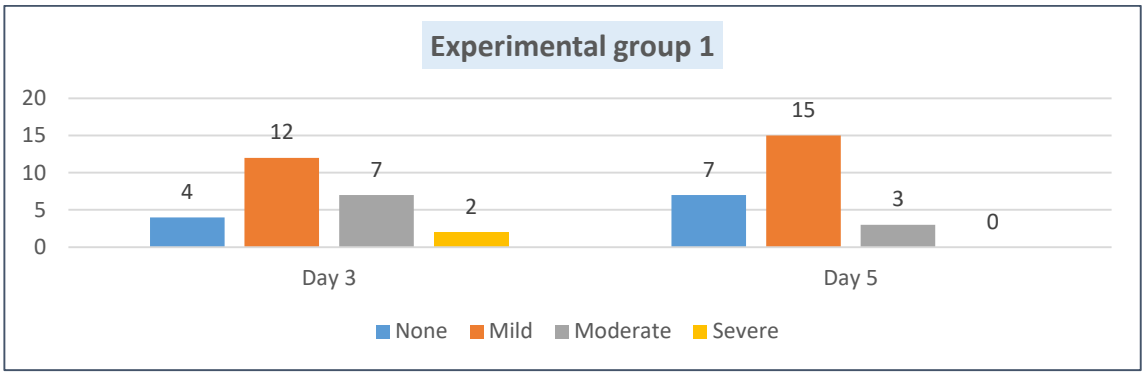
Age (yrs.)	Total number of patients	Percentage
31-40	3	7.5%
41-50	9	17%
51-60	15	29.7%
60	23	45.8%

Demographic details –Age

Experimental group 1

On Day 3, the majority of patients reported mild symptoms. Specifically, 12 patients (50.0%) experienced mild severity. Seven patients been reported with moderate symptoms (29.2%), whereas 4 (16.7%)patients have exhibited no symptoms. Only 2 patients (8.2%) experienced severe symptoms. By Day 5, there was a noticeable shift toward lower symptom severity. Mild symptoms remained the most frequently reported category, observed in 15 patients (60.4%). Importantly, the proportion of patients with no symptoms increased substantially to 07 patients (30.2%). Moderate symptoms decreased to 3 patients (9.7%), while the number of patients with severe symptoms shifted to none. A comparison between Day 3 and Day 5 demonstrated an overall improvement in symptom status. The number of patients reporting no symptoms increased markedly, while those with moderate symptoms showed a considerable reduction. The proportion of severe cases remained low and stable across both time points.

This trend suggests a progressive improvement in clinical status over time, with most patients transitioning toward milder or absent symptoms by Day 5.

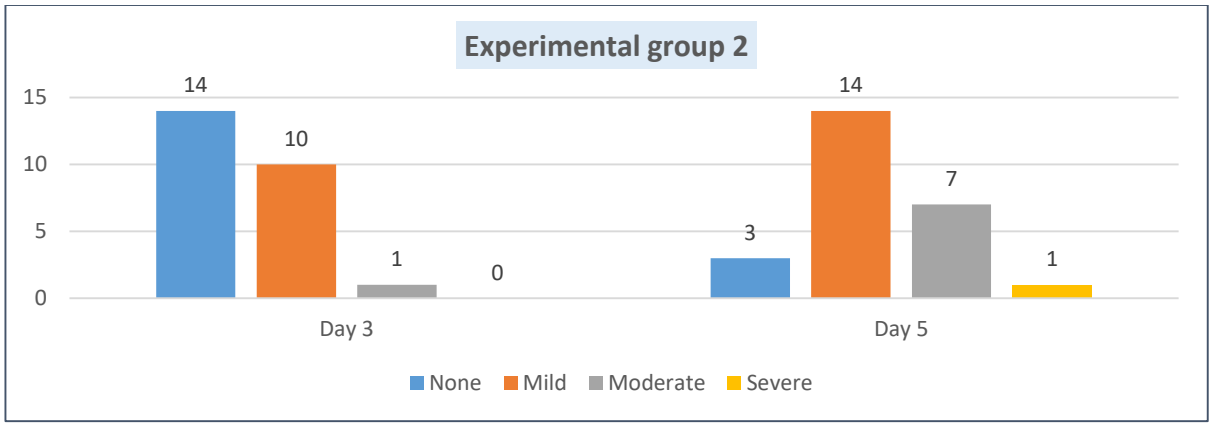


Experimental group 2

On Day 3, a total of 25 participants were evaluated. More than half of the participants reported no symptoms, with 14 individuals (52.8%) falling into the None category. Mild symptoms were reported by 10 participants (40%), while 1 participant (4.3%) experienced moderate symptoms. No cases of severe symptoms were observed on Day 3.

On Day 5, 25 participants were assessed. The proportion of participants reporting no symptoms decreased markedly to 3 individuals (12.2%). Mild symptoms became the most frequently reported category, observed in 14 participants (56.2%). There was a substantial increase in moderate symptoms, reported by 7 participants (28.5%). Severe symptoms were reported in 1 participant (3.1%). A comparison between Day 3 and Day 5 revealed a shift toward higher symptom severity over time. The number and proportion of participants with no symptoms declined sharply, while those experiencing mild and moderate symptoms increased, particularly in the moderate category. Although severe symptoms emerged on Day 5, they remained infrequent.

Because the total number of participants differed slightly between the two assessment points, changes were interpreted primarily using percentage distributions rather than absolute counts.



Comparison of the effectiveness of mouthwashes among group 1 and group 2

	Friedman's ANOVA	P-VALUE
Povidone iodine (n=25)	**67.50%**	**0.05%**
Chlorhexidine (n=25)	**61.43%**	

DISCUSSION

The present study was conducted to check the effectiveness of povidone iodine mouthwash vs chlorhexidine mouthwash in cancer patients and results indicated that povidone iodine mouthwash had a positive effect in reducing oral complications. The findings are in concordance with the study on the efficacy of povidone-iodine mouthwash in the prophylaxis of mucositis in radiotherapy and chemotherapy patients. Hence, the study findings proved that Povidone Iodine mouthwash was effective in reducing the incidence, severity, and duration of radiotherapy- and chemotherapy-induced oral complications. In the present study, it was observed that both mouthwashes were individually effective on oral complications, but the comparison revealed that povidone iodine mouthwash was more effective than chlorhexidine mouthwash on reducing complications.

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