*Original Research Article*

# Comparative efficacy of warm water-only and warm saline mouth bath in oral wound healing


**Abstract**

Aim: The management of oral wounds is aimed at ensuring fast and efficient healing while preventing secondary infections .Warm water and warm saline mouth baths are commonly used for oral wound management, but the comparative efficacy of these two options remains unclear. The aim of the study is to compare the effectiveness of warm saline rinse and warm water-only mouth rinse on the occurrence of infection after dental procedures in a tertiary care hospital.

Study design: A prospective study conducted in the Oral and Maxillofacial unit of the Dental Department at the University of Uyo Teaching Hospital, Uyo. from 2020 to 2023.

Methodology :The study sample was 96 patients with clinically diagnosed pericoronitis who required excision of the operculum and relieved them of the acute problem. They were randomly assigned to Group 1 and Group 2 of 48 each. Group 1 were operculectomy cases managed post-operatively with a warm saline mouth bath while Group 2 comprised operculectomy cases treated with warm water without salt. Comparison of data was done using Pearson's Chi-square, Fisher's exact, or Mann–Whitney U-tests, as applicable. Statistical significance was set at $P = 0.05$.

Results: Mean age of study group was 32 ± 10.66 . The overall number of female patients (n = 32) was less than that of male patients (n = 64) . The most satisfactory wound healing was found among males on the Asepsis score . Wound healing after day 5 and 7 with higher percentage of satisfactory wound healing in both groups. There was no significant difference in healing for both groups of patients who used warm saline and only warm water mouth rinse .

Conclusion:Warm water-only mouthwashes and warm saline mouthwashes are equally helpful in the healing of oral wounds. However, because saline has antibacterial, antiseptic, and anti-inflammatory qualities, using it to treat oral wounds may have additional advantages. As a result, the use of warm saline mouthwashes may be

thought of as a favoured alternative in the care of oral wounds. However, warm water only can be useful in known hypertensive patient where use of salt may be contraindicated.

## Introduction

Oral wounds are common occurrences and can result from different causative factors including trauma, infections, and surgical interventions. The management of oral wounds is aimed at ensuring fast and efficient healing while preventing secondary infections (1).Warm water and warm saline mouth baths are commonly used for oral wound management, but the comparative efficacy of these two options remains unclear. This article provides a comparative analysis of the effectiveness of warm water-only and warm saline mouth baths in oral wound healing.

The numerous treatments utilized for infection prevention include chlorhexidine rinse(2), local antiseptic packs(3), fibrinolytic measures,(4) chlorhexidine mouthwash, systemic and topical antibiotics (5), and warm saline rinse(2).

There isn't much research that compares the effectiveness of warm saline rinse with that of warm water-only without salt mouthwash.(2) (6) This present study compares the effectiveness of warm saline rinse and warm water only mouth rinse on the occurrence of infection after dental procedures in a tertiary care hospital. A null hypothesis was developed, claiming that warm water and warm saline mouthwash were equally effective in preventing post operative infections.The present study deals with the use of warm saline rinse and warm water only mouthwash, being the most readily available and easy-to-use regimen. If using warm water only is found to be effective , it could be useful in managing hypertensive patients who the use of saline solution may be contraindicated.

## Material and Methods

The study was conducted in the Oral and Maxillofacial unit of the Dental Department at the University of Uyo Teaching Hospital, Uyo. from 2020 to 2023. The purpose of the study was to compare the efficacy of warm water-only and warm saline mouth baths in oral wound healing. The modality for the study was explained to the patients and consent was obtained before proceeding with the study. The treatment procedures were performed and managed by the same operator to avoid variations. The study sample was 96 patients with clinically diagnosed pericoronitis who required excision of the operculum and relieved them of the acute problem. They were randomly assigned to Group 1 and Group 2 of 48 each. Group 1 were operculectomy cases managed post-operatively with a warm saline mouth bath while Group 2 comprised operculectomy cases treated with warm water without salt. The inclusion criteria were patients reporting moderate to chronic recurrent pericoronitis in

the mandibular third molar region, who gave consent for the procedure, and who were fit for the procedure under local anesthesia and proceeded with the further treatment. The exclusion criteria were patients with underline medical co-morbid conditions, acute infection, and medically compromised patients that could impair healing.

The region was prepared with betadine using antiseptic procedures to avoid post-operative infection.
In both Groups 1 and 2, local anaesthetic was administered. The pericoronal flap was then held using Adson's tissue holding forceps and excision was done with a bard parker blade 15. Hemostasis was achieved by applyin g direct pressure to the empty space and using sterile gauze. Wound debridement was done with betadine. Patients were recommended to take paracetamol 500 mg twice a day for 3 post-operative days. They were told to follow a soft diet and abstain from smoking and hot and spicy foods for the following 24 hours. Group 1 patients were advised to maintain oral hygiene and rinse every 8 hours a day with warm saline mouth bath solution for a week. Group 2 patients were advised to rinse with just warm water without salt, 8 hourly for a week Patients were recalled after days 5 and 7 following the procedure, and during every follow-up patient were evaluated for healing using Asepsis wound scoring. Comparison of data was done using Pearson's Chi-square, Fisher's exact, or Mann–Whitney U-tests, as applicable. Statistical significance was set at $P = 0.05$.

## Results

**Table I: Asepsis wound scoring system**

| Wound characteristic | Proportion of wound affected | | | | | |
|---|---|---|---|---|---|---|
| | 0 | <20 | 20-39 | 40-59 | 60-79 | >80 |
| Serous exudates | 0 | 1 | 2 | 3 | 4 | 5 |
| Erythema | 0 | 1 | 2 | 3 | 4 | 5 |
| Purulent exudates | 0 | 2 | 4 | 6 | 8 | 10 |
| Separation of deep tissues | 0 | 2 | 4 | 6 | 8 | 10 |

**Points are scored for daily wound inspection**

| Criterion | Points |
|---|---|

| | |
|---|---|
| **Additional treatment** | |
| **Antibiotics** | **10** |
| **Drainage of pus under local anesthesia** | **5** |
| **Debridement of wound (general anesthesia)** | **10** |
| **Serous discharge*** | **Daily 0-5** |
| **Erythema*** | **Daily 0-5** |
| **Purulent exudate*** | **Daily 0-5** |
| **Separation of deep tissues*** | **Daily 0-5** |
| **Isolation of bacteria** | **10** |
| **Stay as inpatient prolonged over 14 days** | **5** |

***Given score only on 5 of 7 days. Highest weekly score used. Category of infection - Total score 0-10: Satisfactory healing, 11-20: Disturbance of healing, 20-30: Minor wound infection, 31-40: Moderate wound infection >40: Severe wound infection (adapted from Wilson AP et al., Lancet 1986 (7))**

Table 2. Frequency distribution of the patients based on their age group.

| Age range | Frequency ($n_=$ 96) (%) |
|---|---|
| 18-27 | 36 |
| 28-37 | 25 |
| 38-47 | 14 |
| 48-57 | 9 |
| 58-67 | 11 |

| | |
|---|---|
| 68-77 | 1 |

Total 96

Table 3 Gender Distribution

| score | Frequency (n=96) (%) | Male (n=64) (%) | Female (n=32) (%) |
|---|---|---|---|
| Satisfactory healing (0-10) | 46 (47.92) | 27 | 19 |
| Disturbance of healing (11-20) | 26 (27.10) | 19 | 7 |
| Minor wound infection (20-30) | 14 (14.58) | 9 | 5 |
| Moderate wound infection (30-40) | 7 (7.29) | 6 | 1 |
| Severe wound infection (>40 | 3 (3.12) | 3 | 0 |

Pearson Chi-square test: $\chi 2 = 2.621$, df=4, P=0.572

Table 4: Wound healing using warm saline water

| Day | Satisfactory healing (score 0-10) (%) | Disturbance healing (score 11-20) (%) | Minor wound infection (score 20-30) (%) | Moderate wound infection (score 30-40) (%) | Severe wound infection (score >40) (% | Mean* rank |
|---|---|---|---|---|---|---|
| 5 | 36 (75.00) | 10 (20.83) | 2 (4.17) | 0 (0) | 0 (0) | 51.15 |
| 7 | 41 (90.91) | 7 (4.55) | 0 (0) | 0 (0) | 0 (0) | 48.85 |

Kruskal–Wallis test: $\chi 2$ =7.58 df=4, P=0.076*

Table 5: Wound healing using warm water only

| Day | Day Satisfactory healing (score 0-10) (%) | Disturbance healing (score 11-20) (%) | Minor wound infection (score 20-30) (%) | Moderate wound infection (score 30-40) (%) | Severe wound infection (score >40) (% | Mean* rank |
|---|---|---|---|---|---|---|
| 5 | 33 (68.75) | 12 (25) | 3 (6.25) | 0 (0) | 0 (0) | 51.30 |
| 7 | 37 (77.08) | 10 (20.83) | 1 (2.08) | 0 (0) | 0 (0) | 46.93 |

*Kruskal–Wallis test: $\chi 2$ =8.479, df=4, P=0.076

Results

A total of 96 patients were involved in the study . They were grouped into 2 of 48 each . Age range of patients was 18 to 77 years . Mean age of study group was 32 ± 10.66 (Table 1). The overall number of female patients (n = 32) was less than that of male patients (n = 64) as shown in table 2. The most satisfactory wound healing was found among males . (Table 3). Tables 4 and 5 shows wound healing after day 5 and 7 with higher percentage of satisfactory wound healing in both groups. There was no significant difference in healing for both groups of patients who used warm saline and only warm water mouth rinse

Discussion:

This study showed an average age range of 32. This is in agreement with Osunde et al (6) who observed a similar trend. Healing with satisfactory Asepsis score was found in both methods of mouth rinse almost at same level. However, it was observed that healing was slightly better using warm saline solution as against using only warm water although there is no significant difference

Postoperative facial oedema can be lessened by making a hypertonic solution with one teaspoon of salt and a glass of lukewarm water (8). The hypertonicity of the warm water, which can both inhibit bacterial growth and encourage the proliferation of commensal bacteria in the mouth, is the likely mechanism of action for this.

The bacteriostatic action occurs when the substantially more concentrated hypertonic saline solution draws bacterial intracellular fluid out through the bacterial cell wall, which acts as a semipermeable membrane, in a process known as plasmolysis. (9)

The research investigated the effectiveness of warm water-only mouthwashes with warm saline mouthwashes in comparative tests. Both subjective and objective markers of healing were reported in every study group. The study found no discernible difference in the healing of oral wounds between warm water mouthwashes and warm saline mouthwashes. Warm saline mouthwashes, however, were more successful in lowering swelling and hastening the recovery of oral lesions.

Conclusion:

According to this comparative study , warm water mouthwashes and warm saline mouthwashes are equally helpful at speeding up the healing of oral wounds. However, because saline has antibacterial, antiseptic, and anti-inflammatory qualities, using it to treat oral wounds may have additional advantages. As a result, the use of warm saline mouthwashes may be thought of as a favoured alternative in the care of oral wounds. However, warm water only can be useful in known hypertensive patient where use of salt may be contraindicated.

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