The effect of using various types of mouthwashes on wound healing and patient comfort following extractions in Taibah University patients

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ABSTRACT

Objective: This study aimed to assess the effects of povidone-iodine, salt base water (Himalaya), and normal saline on soft tissue healing and pain alleviation as post-extraction mouthwashes in the dental clinic of Taibah Dental Hospital in Saudi Arabia.

Methods: In the present study, the effects of various types of mouthwash, including normal saline, Himalaya natural salt mouthwash, and diluted betadine solution were compared regarding the extraction socket healing and improved patient experience. The pain and edema were assessed using a visual analog scale, and soft tissue healing was assessed using the Landry and Turnbull criteria.

Results: On the first day, nearly all the study participants experienced the same level of discomfort, which then progressively subsided over 5 days. The wounds were examined for soft tissue healing on days 3 and 7 following surgery and revealed no difference between the groups.

Conclusion: Despite the fact that all mouthwash types produced equal beneficial effects, there was no statistically significant difference in the effect of using various types of mouthwash on the acceleration of soft tissue healing or the reduction of pain after uncomplicated exodontia.

Keywords: Extraction, mouthwash, healing, pain, Saudi Arabia.

Introduction

It has long been known that rinsing with mouthwash the day following extraction has a significant influence on accelerating socket closure and improving patient experience after oral surgical procedures [1,2]. The patient’s general health is the main priority in dentistry. Interventional dental procedures, such as oral surgery and tooth extraction, require the highest level of professionalism [3].

Dentists must eliminate potentially dangerous effects from operations to achieve the highest quality. The safe and healthy healing of wounds following oral surgery is one of the quality requirements [3,4]. Previous research demonstrated the effectiveness of using warm saline mouthwash, povidone-iodine (betadine), and saltwater-based oral rinses as post-extraction mouthwashes to reduce inflammation and tissue reactions [5].

Povidone-iodine (betadine), a rapid but broad-spectrum mixture of povidone and iodine, is used as an antiseptic to clean the skin and mucous membranes before operations and to treat infected wounds. It also possesses fungicidal, sporicidal, bactericidal, and viralicidal actions. The occurrence of dry sockets following surgical extraction of impacted mandibular third molars is reported to be

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Received: 11 June 2023 | Accepted: 19 June 2023
eliminated by betadine 1% mouthwash [6]. Recent investigations have demonstrated its inflammatory, hemostatic, and bacteremia-reducing properties. Alveolar osteitis is prevented and a reduction in pain after extraction is promoted by the use of warm saline mouthwash [5]. Oral rinses made of salt and water balance the pH of the oral cavity, alkalinate the mouth, and function as an astringent that speeds wound healing by lowering inflammation and tissue contraction. Himalayan salt is one of the many varieties of salt. Himalayan salt is rich in minerals, including calcium, copper, iron, zinc, magnesium, and potassium, and it contains 84 of the 92 elements that the body requires. It greatly strengthens the body’s immune system and enhances the respiratory, circulatory, and neurological systems as well. It can provide pain relief [7,8].

Despite having an antibacterial effect, chlorhexidine gluconate was not used in this investigation because it could discolor teeth, restorations, and mucous membranes, temporarily impair taste perception, make the oral mucosa painful and dry, and slightly increase supragingival calculus. In addition, cases of hypersensitivity, including anaphylaxis, related to antiseptics occur [9]. It is a valuable issue for patients to produce an effective and simple natural-based mouthwash. Thus, the purpose of this study was to assess the effects of povidone-iodine, salt base water (Himalaya), and normal saline on soft tissue healing and pain alleviation in the dental clinic of Taibah Dental Hospital in Saudi Arabia as post-extraction mouthwashes.

Subjects and Methods

A total of 89 patients between the age of 18 and 60 years participated in the random intervention single-blinded study. Patients who underwent minor oral surgery operations at Taibah University’s College of Dentistry were included, while patients with major systemic diseases were excluded from the study group. The study was conducted between August 2021 and March 2023. The study contains only one phase, which included the treatment of the patient and prescribing mouthwash. Participants were divided into three groups by asking them to choose the mouthwash A, B, or C before the therapy. Normal saline was used as the first group’s control (A). The second group (B) received a diluted betadine solution (10.5 ml of a povidone-iodine 10% solution in 200 ml of water), and the third group (C) used Himalayan natural salt to make salty water (1 teaspoon of the 26% Himalayan natural salt solution in 200 ml water).

Participants were instructed to rinse pre- and post-extraction three times each day for the next 5 days. The three groups requested a follow-up on days 3 and 7 after extraction to assess soft tissue healing using the Landry and Turnbull criteria [10], as well as pain and swelling assessed using a visual analog scale.

The Landry and Turnbull criteria included (1) very poor (more than 50% of the gingiva are red and when palpated, there is bleeding and granulation tissue is present. Suppuration is present, and the incision margin is not epithelized). (2) Poor (more than 50% of gingiva are red and the tissue bleeds upon palpation, the connective tissue is not visible at the incision, margin granulation tissue is present, the incision margin is not epithelialized, and there is no oozing pus). (3) Good (tissue color is 25% to 50% gingiva red, no bleeding is detected upon palpation, and there is no granulation tissue). (4) Very good and (5) excellent if gingiva is less than 25% red in color. No bleeding is detected upon palpation. There is no granulation tissue. Upon incision, no connective tissue is revealed at the margin. Suppuration is absent.

Results

Based on the present inclusion criteria, 89 patients were included in the study (44 males and 45 females). The treatment involved removing a tooth or root tips from its socket while minimizing injury to the surrounding structures as possible, which might result in bleeding, pain, and swelling. Patients were classified into three groups based on the mouthwash solution they were given. The first group was represented by 29 patients (32.58%) who got solution A. In the second category, there were 28 patients (31.40%) who received solution B. Solution C was given to 32 patients (35.95%) in the third category (Figure 1).

All participants in this study (control and study groups) had nearly the same pain score on the first day, with a total mean of 2.08; however, the pain gradually decreased over
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the following 5 days, reaching a total mean of 0.33 on the fifth day. There was no statistically significant difference between the study and control groups ($p > 0.05$) (Table 1).

The extraction of wounds in the current investigation was evaluated using the Landry et al. [10] index examination of the wounds on the third and seventh postoperative days, at two separate intervals. The results of this study indicated that using different types of mouthwash has no statistically significant effect on how quickly soft tissue heals ($p > 0.05$) (Table 2).

Discussion

The formulation of a natural mouthwash that is efficient and simple to use is important for patients. In order to compare their effects on soft tissue healing and pain alleviation in the dental clinic of Taibah Dental Hospital in Saudi Arabia. Povidone-iodine, salt base water (Himalaya), and regular saline have been used. The results of this study showed that there was neither faster wound healing nor any impact on reducing postoperative pain between the study groups and the control group.

Due to a high-caries index and a large proportion of teeth that cannot be restored, extractions of teeth or root tips from their sockets are a common practice in Saudi Arabia’s dental clinics [11-13]. Along with the significant number of extraction cases, the Oral & Maxillofacial Surgery (OMS) clinics see a large number of recurrent postoperative problems such as dry sockets, infected sockets, delayed healing, and postoperative pain [14]. Numerous studies have been recently undertaken to speed up the healing process and reduce postoperative problems.

There is relatively little research in the current study community on the effects of utilizing various types of mouthwash (normal saline, diluted betadine solution, and Himalaya natural salt) on accelerating the healing of wounds or reducing postoperative pain after tooth extraction. There are various stages of healing of a removed tooth (inflammation, epithelialization, fibroplasia, and remodeling). Sockets heal as a result of secondary intention. As a result, months are required until the extraction site could no longer be distinguished radiographically.

Using mouthwashes at the beginning of the healing process is essential to promote healing and prevent microbe invasion inside the socket, which is typically left unsutured, uncovered, and exposed to all oral irritants [15]. The empty socket would be filled with blood, acting as a seal from the oral environment. Any disturbance during the coagulation might regress the healing process. Bacteria in the mouth clump together to produce a complex dental biofilm. Mechanical hygiene procedures do not always eradicate dental biofilms. Some people might have problems with technique, such as children, the disabled, and those who are overly busy [16].

Salt is a mineral that has existed from the beginning of history. Salt is a natural healer that reduces inflammation and boosts immunity. Gargling with pink Himalayan salt water prevents bacterial accumulation and aids in the removal of irritants such as allergens and fungi from the mouth. Himalayan salt contains minerals that help to mineralize tooth enamel (while 98% of the minerals in pink Himalayan salt are sodium chloride, it is the trace minerals calcium, potassium, and magnesium that give

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<tr>
<th>Degree of pain</th>
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<th>Solutions</th>
<th>Description of the mean during the follow-up appointment</th>
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<td>3.54</td>
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<td>4.41</td>
<td>4.11</td>
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Table 1. The average value for each group and the degree of pain over a 5-day period.

Table 2. The Landry et al. [10] index was employed to assess the healing of soft tissues.
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201 Miller claimed that antiseptics could kill infectious bacterial germs. Therefore, antiseptics could be applied to disperse the structured biofilm and eliminate the bacterial cell [19]. Chemical antiseptics come in many forms. For instance, mouthwashes are typically recommended due to their usability [20].

202 The most well-known synthetic mouthwash is frequently identified as betadine 2% which is a multipurpose antiseptic used for infection treatment and prevention.

203 The gradual release of iodine causes antiseptic action [21]. The 2% betadine gargle destroys and stops the growth of infection-causing germs, alleviating inflammatory symptoms. It aids in the maintenance of excellent oral hygiene which could be extremely embarrassing and impact your social life [22].

204 Following the COVID-19 pandemic, all of these advantages have been addressed, and its use in dental treatments has increased. Many dental clinics now administer it as a routine pre-dental prophylactic [23,24] to prevent the spread of infections in dental clinics [25-27]. Long-term use was limited by tooth and tongue staining, as well as changed taste [28]. However, the lack of negative effects has highlighted the need of using natural antibacterial herbs [29] such as green tea, Aloe vera, and Himalayan salt.

205 Pain is characterized as an unpleasant feeling and emotional experience brought on by tissue damage that the body uses to combat and impede more tissue damage. It is regarded as a crucial nervous system function because sensory receptors at the wounded regions pick it up and send electrical signals to the brain. There was no statistically significant difference in the subjects’ perceptions of pain between the study groups (diluted betadine solution and Himalaya natural salt) and the control group (normal saline) on the first post-operative day; the pain scores for all groups were nearly the same. After that, the discomfort progressively reduced on the fifth post-operative day. The soft tissue recovery showed similar outcomes in both the research groups and the control group 1 week after the surgery.

206 The usage of various types of mouthwash has nothing to do with the healing process. Several factors, other than the use of these mouthwashes, might contribute to the healing process and as a result, natural products have so become more effective and affordable replacements [30].

207 The minimal number of participants involved in the investigation was the current study’s primary limitation. Therefore, further research is advised to evaluate the effects of employing normal saline, diluted betadine solution, and Himalaya natural salt on the postoperative complications related to tooth extraction, as well as to investigate their effectiveness in reducing pain and promoting the healing of soft tissues by additional in vivo trials with bigger sample sizes and longer duration, studying subtractions of antimicrobial activities.

208 Conclusion

209 There was no statistically significant difference between the effects of using different types of mouthwash on the speed of soft tissue healing or the reduction of post-tooth extraction pain and healing of the tooth socket.

210 Conflict of interest

211 The authors declare that there is no conflict of interest regarding the publication of this article.

212 Funding

213 None.

214 Consent to participate

215 Written informed consent was obtained from all the participants.

216 Ethical approval

217 The study was approved by the Ethics Committee at Taibah University Dental College: Ref# (ethical code. TUCDREC/03122020), dated: 08/02/2021.

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223 References


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