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Efficacy of 1% Betadine Mouthwash on the Incidence of Dry Socket after Mandibular Third Molar Surgery

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INTRODUCTION: Dry socket (syn. Alveolar osteitis, Alveolitis sicca dolorosa) is one of the most common complications after extraction of a tooth with a high incidence after a surgical extraction, particularly seen in the mandibular third molars.

AIM: To assess the efficacy of 1% betadine mouthwash in prevention of dry socket.

MATERIALS AND METHODS: The study included a sample of 154 patients visiting the department of Oral and Maxillofacial Surgery at Tatyasaheb Kore Dental College and Research Centre, Kohlapur, Maharashtra, India for surgical extraction of their impacted mandibular third molar and categorized as class A and B according to Pell and Gregory classification. The case group included patients who were provided with povidone iodine 1% oral antiseptic solution (Betadine), while no intervention was provided to the control group. All patients took 400 mg Ibuprofen (oral) one hour prior to the extraction. Post-surgery, patients were recalled on the third and seventh day and the data was recorded in the pre-filled proforma, data was entered in Microsoft excel, transferred into SPSS version 21.0 and the t-test was applied to analyze the data obtained.

RESULTS: It was observed that 26 patients (16.89%) had a dry socket present. The presence of dry socket was slightly higher among females 14, (53.84%) as compared to males (12, 46.6%). Mostly, fair oral hygiene was observed among the study subjects. No significant correlation was observed between oral hygiene status and incidence of dry socket ($p > 0.05$). A statistically significant correlation between the cases and control group ($p = 0.047$) was observed.

CONCLUSION: Povidone iodine 1% mouthwash reduces the incidence of dry socket following surgical extraction and hence, its use prior to surgical extraction of impacted teeth is recommended for better topical infection control.

KEYWORDS: Dry Socket, Betadine Mouthwash, Impaction, Surgical Extraction

INTRODUCTION

Dry socket (syn. Alveolar osteitis, Alveolitis sicca dolorosa) is one of the most common complications after extraction of a tooth.¹ The incidence of dry socket after a surgical extraction is higher than a routine extraction, the highest being of mandibular third molars. The signs and symptoms include moderate to severe pain after 3-5 days¹ of the extraction which sometimes can radiate to the ear and neck, halitosis, purulent discharge, lymphadenopathy etc. On clinical examination, there is visibly exposed bone, necrosis of tissue overlying the socket. On palpation, the area is tender; including the lymph nodes (mostly submandibular) which are also palpable and tender.²

No particular etiology is known, although smoking, tooth position, pericoronitis, gender have been postulated. The pathogenesis has not been clearly understood. It has been suggested that there is increased fibrinolysis leading to disintegration of the blood clot formed after extraction. Superimposed bacterial infection has also been postulated.³ Age of the patient, improper

irrigation of the socket and dislodgement of the clot has been listed as the risk factors.^{3,4}

The prevention and treatment of dry socket is of utmost importance as it is the most common post-operative complication of tooth extraction. The use of topical and systemic antibiotics, mouthwashes, eugenol dressing, chlorhexidine, steroids has been well documented in preventing the incidence.³

Betadine is a combination of povidone-iodine which is an effective medication used in treating minor wounds and skin infections, surgical preparation of skin, etc. It is a broad spectrum antibiotic and has antiseptic, fungicidal and sporicidal properties. Additionally, it has hemostatic and anti-inflammatory effects.⁴

Betadine manifests longer lasting antiseptic properties on contact with the skin and does not irritate it. It is most commonly used in the form of 10% solution as a skin antiseptic. Hence, aim of the present study is to assess the efficacy of 1%



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betadine mouthwash in prevention of dry socket.^{3,4}

MATERIALS AND METHOD

The present study included a sample of 154 patients who visited the department of Oral and Maxillofacial Surgery at Tatyasaheb Kore Dental College and Research Centre, Kohlapur, Maharashtra, India for surgical extraction of their impacted mandibular third molar following an ethical approval from the institution. The patients were explained about study and a written consent according to Helsinki Declaration was obtained from them prior to the initiation of the surgical extraction.

Those patients with teeth categorized as class A and B as per Pell and Gregory classification⁵, non-smokers and those not using antibiotics/contraceptives at the time of the study were included in the study. The exclusion criteria included patients not willing to be a part of the study, pregnant females or those suffering from any systemic condition(s).

The patients were grouped into the experimental and control groups based on random assignment by the investigators using a lottery method to avoid any bias and assure homogeneity of the groups. The case group included patients who were provided with povidone iodine 1% oral antiseptic solution (Betadine). Moreover, gauzes soaked in povidone iodine 1% was placed on the third molars and adjacent teeth for 2 to 5 minutes. No intervention was provided to the control group. All patients took 400 mg Ibuprofen (oral) one hour prior and their oral hygiene index was recorded using the OHI-S index. After an hour, local anesthesia was administered with one/two Lidocaine cartridges and epinephrine 1:8000 to

induce analgesia in the inferior alveolar nerve, lingual nerve, and long buccal nerve and took approximately 45-60 seconds.

After a 2-5 minute gap to ensure adequate efficiency of local anesthetic, a sulcular incision was given mesial to the second molar and was continued distally to obtain an inclined incision. The flap was elevated and an osteotomy/tooth section was carried out depending on the complexity of the tooth anatomy and subsequently, tooth was extracted and sutures were placed. All patients were prescribed 400 mg Ibuprofen for three days (TDS). No antibiotic was prescribed to any of the patients.

Post-surgery, patients were recalled on the third and seventh day and the data was recorded in the pre-filled proforma, data was entered in Microsoft excel, transferred into SPSS version 21.0 and the t-test was applied to analyze the data obtained.

RESULTS

Table 1 depicts the presence of dry socket in the study population in relation to gender, age and oral hygiene status (good, fair and poor). Of the total 154 participants who were a part of the study, 26 (16.89%) had a dry socket present. The presence of dry socket was slightly higher among females 14, (53.84%) as compared to males (12, 46.6%). The maximum participants in the study were less than equal to 30 years of age and the t- test showed a significant correlation between age and the incidence of dry socket ($P=0.001$). Mostly, fair oral hygiene was observed among the study subjects. No significant correlation was observed between oral hygiene status and incidence of dry socket ($p>0.05$). There was no significant difference in terms of the oral hygiene at the distribution of patients between test and control groups ($p>0.05$)

| PATIENTS | TOTAL | GENDER | | AGE (IN YEARS) | | ORAL HYGIENE STATUS (OHI-S) | | |
|--------------------|------------------|------------------|-----------------|-----------------|-----------------|-----------------------------|-----------------|-----------------|
| | | Male | Female | ≤30 | ≥30 | Poor | Fair | Good |
| With Dry Socket | 26 (16.89%) | 12(19.05%) | 14 (15.38%) | 8(9.88%) | 18(24.66%) | 7(24.14%) | 15(17.86%) | 4(9.75%) |
| Without Dry Socket | 128 (83.11%) | 51(80.95%) | 77(84.62%) | 73(90.12%) | 55(75.34%) | 22(75.86%) | 69(82.14%) | 37(90.25%) |
| Total | 154(100%) | 63 (100%) | 91(100%) | 81(100%) | 73(100%) | 29(100%) | 84(100%) | 41(100%) |

Table 1. Characteristics of Patients With and Without Dry Socket in Relation to Gender, Age, and Oral Hygiene Status.

| Patients | Receiving Betadine Mouthwash (Control) | Not Receiving Betadine Mouthwash (Cases) | Total | t-test |
|--------------------|--|--|-------------------|---------------------------------------|
| With Dry Socket | 9 (34.61%) | 17 (65.39%) | 26 (16.89%) | 0.047* (Statistically significant) |
| Without Dry Socket | 73 (57.03%) | 55 (42.97%) | 128 (83.11%) | |
| Total | 82(53.24%) | 72(46.76%) | 154 (100%) | |

Table 2. The Incidence of Dry Socket in Cases and Controls

(Table 1).

A statistically significant correlation between the cases (ones receiving povidone-iodine 1% oral rinse) and control group ($p=0.047$) in relation to the prevalence of dry socket was observed and is shown in table 2.

DISCUSSION

Common complications in dentistry include the presence of a dry socket. The present study aimed to evaluate the effect of 1% Betadine mouthwash in prevention of dry socket after surgical extraction of impacted mandibular third molars and through its results, stated that although incidence of dry socket was not associated to gender, increased cases were observed in older patients, oral hygiene status of the patients was not correlated to dry socket occurrence and a significant reduction in the incidence of dry socket in the experimental group where povidone-iodine 1% oral rinse was used compared to the control group.

Of the total 154 participants who were a part of the study, 26 (16.89%) had a dry socket present. While authors report that the prevalence of dry socket ranges from 0% to more than 35%,⁶ the incidence found in the present study was higher as compared to Chandran S (5.37%),⁷ Khan A (3.3%)⁸ and Kumar MDA et al. who reported only one female patient with an incidence of dry socket in tooth number 48 among 420 of their study population.⁹

There are several studies by various authors who link poor oral hygiene to the incidence of dry

socket. Most patients in the present study with dry socket were found to have “fair” oral health (non-significant) and it is in agreement to Hasheminia D et al.⁴ Various other authors also state that satisfactory oral hygiene is a factor that leads to a decrease in the incidence of dry socket.^{10,11}

The outcomes of the present study demonstrate that females had a higher incidence of dry socket in comparison to their male counterparts and was statistically significant. These results are in agreement to various other researchers and the reason for this could be due to the cause that hormones, combined with oral contraceptive pills that can progress the fibrinolytic actions in blood and women’s saliva during their menstrual cycle leading to a higher incidence of dry socket.^{4,8,12-13}

The findings of the present study are in agreement to Hasheminia D et al.⁴ and Mesgarzadeh et al.¹⁴ who introduced and stated that povidone iodine 1% mouthwash as a cause of decreased incidence of dry socket. Our results also highlighted a significant relationship between the use of the povidone iodine 1% mouthwash and incidence of dry socket, and was in disagreement to the findings of Sweet et al.¹⁵ The diminished occurrence of in occurrence of dry socket after utilization of a topical antimicrobial substance shows light on the role on bacteria in the development of a dry socket.

CONCLUSION

The results of the present study indicate that povidone iodine 1% mouthwash reduces the incidence of dry socket following surgical extraction of the impacted mandibular third

molars suggesting its use prior to surgical extraction of impacted teeth for better topical infection control.

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