



ORIGINAL RESEARCH PAPER

Dental Science

EFFICACY OF ANTIBIOTIC PROPHYLAXIS POSTOPERATIVELY IN PATIENTS UNDERGOING THIRD MOLARS SURGERY- A COMPARATIVE STUDY.

KEY WORDS: Impaction, Antibiotic, Complications.

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ABSTRACT

Background & Objectives: It is a common practice now a days to prescribe antibiotics after 3rd molar surgery. The most common drug used is amoxicillin and its related compounds. Indiscriminate use of amoxicillin carries serious effects of developing resistance to the drug. In this study we investigated the efficacy of amoxicillin in reducing the post operative complications after removal of mandibular 3rd molar.

Methodology: A study was carried on 40 patients of age group 18- 35 years who required impacted mandibular 3rd molar tooth removal bilaterally in a randomized controlled manner. For group A (one side) amoxicillin was given from one hour before surgery till 3 days postoperatively. For group B (other side) placebo was given. Alveolar osteitis, surgical wound infection, trismus, swelling, dysphagia were assessed 2nd and 10th days postoperatively.

Results: No statistically significant (p value >0.05) results were found in patients in group A and group B with wound infection, trismus, swelling and dysphagia as parameters for evaluating postoperative sequelae.

Conclusions. This study suggests that prophylactic amoxicillin is not effective for the prevention or reduction of postoperative complications after the removal of impacted mandibular third molars when preoperative infections are absent.

INTRODUCTION: Surgical removal of unerupted impacted lower third molars is a common procedure. The complication most frequently encountered are dry socket, swelling and trismus of some degree. Unless related to infection or excessive trauma, these are regarded as a normal response to surgery¹. Actually, there is no consensus regarding the use of antibiotics to minimize these complications². Authors which advocate routine antibiotic prophylaxis seem to imply that, in addition to preventing infection and reducing the incidence of dry socket, general postoperative morbidity is reduced¹. Quality of life is stated to be higher when antibiotics are prescribed².

Complications of odontogenic infections have been reported as a result of bacteremia, induced autoimmune response, diffusion through anatomic planes, and paths of least resistance^{3,5}.

surgical wounds of the oral cavity have been classified as clean-contaminated wounds. Clean-contaminated wounds can be managed with preoperative prophylactic antibiotics if there are no other major risk factors⁶.

On the contrary, many studies have not demonstrated the effectiveness of antibiotics^{7,8}. There is a well-documented increase in bacterial resistance worldwide⁹.

Amoxicillin is a broad-spectrum bactericidal antibiotic of low toxicity, with favorable pharmacologic properties and minimal side effects. Its usefulness in the treatment of oral infections has been previously demonstrated¹⁰. The main goal of this study is to compare the efficacy of amoxicillin versus placebo on the postoperative complications of third molar surgery.

AIM- To compare the efficacy of amoxicillin versus placebo on the postoperative complications of bilateral mandibular third molar surgery 2nd and 10th days postoperatively.

OBJECTIVES- To assess the presence or absence of alveolar osteitis, surgical wound infection, trismus, swelling, dysphagia 2nd and 10th days postoperatively.

METHODOLOGY- A study was carried on 40 patients of age group 18- 35 years who required impacted mandibular 3rd molar tooth removal bilaterally in a randomized controlled manner. Two groups were made and patients were randomly allocated to the two groups in split – mouth technique. In group A (one side) amoxicillin was given from one hour before surgery till 3 days postoperatively. The other side group B placebo was given.

Alveolar osteitis, surgical wound infection, trismus, swelling, dysphagia were assessed 2nd and 10th days postoperatively.

INCLUSION CRITERIA: American Society of Anesthesiologists [ASA] classifications I or II patients of age group

18 to 35 years, with no periodontal disease were included in the study. Indication for bilateral removal of mandibular third molars.

EXCLUSION CRITERIA: Subjects with any previous history of complications associated with local anaesthetic administration. Pregnant women and lactating mother. Presence of acute infection or swelling. Patients unable to give informed consent. Patients on regular tobacco use. Procedure more than 1 hour.

Complete history of all patients was taken. OPG was taken for every patient. Informed consent was taken and left and right side was randomly allocated to the study group A and group B. Impacted teeth were defined as being in position A, B or C according to the Pell and Gregory classification¹¹. They were also classified as vertical, mesioangular, distoangular, horizontal, inverted, buccal and lingual impaction according to the Winter classification¹². Local anesthesia was given. Surgical extraction of third molar was carried out. Following the surgery, the standard postoperative instructions were given to the patients. In group A patients amoxicillin was given 1 hour prior to the surgery till 3 days. In group B patients placebo was given to the patient. The NSAID administration protocol was 50-mg tablets of diclofenac taken orally twice daily for 4 days after surgery. Patient was followed up on 2nd and 10th day of surgery.

Infection was defined on the basis of following clinical criteria. Body temperature > 37.8°C for over 24 hours or severe pain persisting or increasing 48 hours after surgery accompanied by intraoral inflammation or severe pain after day 7 accompanied by intraoral inflammation and/or intraoral erythema with no other identifiable cause which improves with antibiotic treatment, Intraoral abscess.

Alveolar osteitis was measured by absence of a clot with necrotic remains present in the alveolus with severe mandibular pain. Swelling was measured as the difference between the distance (mm) between the lower earlobe and the corner of mouth antero-posteriorly and from corner of the eye to lower border of the mandible superio-inferiorly on the extraction side. Mouth opening was measured as the distance between upper and lower incisors(mm). Dysphagia was measured as present or absent.

RESULTS

For statistical analysis, Chi square test and Mann-Whitney Test were done and "p" value less than 0.05 was accepted as indicating statistical significance.

A total of 40 patients were included in the study. Out of them 22 were males and 18 were females. A mean age of 24.3 years found. The type of impaction according to winter's classification are discussed in table 1.

| Type of impaction | Group A | Group B |
|-------------------|-----------|----------|
| Vertical | 11(27.5%) | 9(22.5%) |
| Mesio-angular | 18(45%) | 20(50%) |
| Horizontal | 3(7.5%) | 4(10%) |
| Disto-angular | 7(17.5%) | 5(12.5%) |
| Bucco-angular | 1(2.5%) | 2(5%) |
| Lingo-angular | 0(0%) | 0(0%) |
| Inverted | 0(0%) | 0(0%) |

TABLE 1: Type of impactions included in the study.

| Postoperative complications | Group A | | Group B | |
|-----------------------------|---------------------|----------------------|---------------------|----------------------|
| | 2 nd day | 10 th day | 2 nd day | 10 th day |
| Infection | 6(15%) | 1(2.5%) | 7(17.5%) | 2(5%) |
| Alveolar osteitis | 1(2.5%) | 0(0%) | 1(2.5%) | 0(0%) |
| Dysphagia | 4(10%) | 0(0%) | 5(12.5%) | 0(0%) |
| Trismus | 32(80%) | 3(7.5%) | 34(85%) | 5(12.5%) |
| Swelling | 29(72.5%) | 0(0%) | 30(75%) | 0(0%) |

32 impacted teeth (40%) were partially erupted, 33.75% (27) were submucosal, and 26.25% (21) consisted on intraosseous impaction. In 57.5% (46) of the cases there was insufficient space between the anterior border of the mandibular ramus and distal surface of the second molar for the entire crown (class 2).

Post-operative results of infection, alveolar osteitis, dysphagia, trismus, swelling showed no statistically significant difference between the two groups (p value > 0.05). (Table 2)

Table 2- Results of post-operative complications.

No other complications of vomiting, nausea, diarrhea, rashes, gastric pain was found in any of the patients. Bleeding was seen in 5 cases in total (3 in group A and 2 in Group B). ulcers at the site were seen in 3 cases (2 in group A and 1 in Group B).

DISCUSSION

As more invasive or difficult procedure is performed, there is an increased amount of trauma to the surgical site and surrounding tissues. A greater amount of tissue injury leads to increased inflammation¹³. Surgery should be performed with lesser amount of trauma to the surrounding tissues. In our study we determined that patients with operating time less than one hour to be included in the study.

A study conducted by Kay et al showed that without antibiotic prophylaxis, alveolar osteitis occurred in 325 of 1341 patients who had had third molars extraction, on the contrary only 50 of 1620 patients developed alveolar osteitis in group of patients where preoperative dose of penicillin was given¹⁴. Other studies conducted by Rub et al¹⁵ and Freitag et al¹⁶, found no significant increase in complications in infected cases operated without penicillin prophylaxis as with our study. A meta-analysis done by Ren et al¹⁷ reviewed 16 methodologically standardized studies reported a frequency of alveolitis of 6.2% among patients receiving some type of antibiotic prophylaxis and of 14.4% among those who did not. In our study only 2.5% patients showed alveolitis in both groups.

Authors have shown differences in pre-operative and post-operative drug results. López-Cedrún et al¹⁸ showed that the best results were obtained by using the drug postoperatively whereas Luaces-Rey et al¹⁹ showed no significant postoperative differences between the preoperative and postoperative groups. In our study we prescribed antibiotics 1 hour before procedure and up till 3 days postoperative.

In our study there was no adverse reactions with the medication (nausea, stomach pain, sleepiness, and trembling, vomiting or diarrhea).

CONCLUSION- Indiscriminate use of antibiotics increases the risk of antibiotic-related toxicity, allergic reactions, secondary infections, and bacterial resistance. In our study, prophylactic use antibiotics in the surgical removal of lower third molars did not improve postoperative inflammatory complications and wound healing.

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