Research Article

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A Clinical Study Conducted to Assess the Role of Prophylactic Antibiotics in Impacted Mandibular Wisdom Teeth

Sadam Srinivasa Rao[1*] Sukhvinder Bindra[2] Madhusudan Rao[3] J Phani Kumar[4] Naveen Kokkula[5]

[1]Associate Professor, Department of Oral and Maxillofacial Surgery, Army Institute of Dental Science, Secunderabad, Andhra Pradesh, India.
[2]Reader, Department of Oral and Maxillofacial Surgery, Army Institute of Dental Science, Secunderabad, Andhra Pradesh, India.
[3]Senior Lecturer, Department of Oral and Maxillofacial Surgery, Army Institute of Dental Science, Secunderabad, Andhra Pradesh, India.
[4]Reader, Department of Oral and Maxillofacial Surgery, Meghna Institute of Dental Sciences, Nizamabad, Andhra Pradesh, India.
[5]Reader, Department of Oral and Maxillofacial Surgery, Aditya Dental College, Beed, Maharashtra, India.

ABSTRACT

Background: Use of prophylactic antibiotics in third molar surgery has long been an issue of controversy in clinical practice[1]. It has been reported in the literature that in medically healthy patients, there is no indication for antibiotic prophylaxis[2]; however, some recent studies reported some positive effects regarding reduction in pain and wound infection after preoperative and postoperative antibiotic therapy[3].

The present study was undertaken to evaluate and compare the recovery after impacted third molar surgery by clinically assessing the patient for postoperative inflammatory symptoms and infection rate with or without the use of antibiotic therapy preoperatively and postoperatively and to evaluate the need for; prophylactic\antibiotic administration in the removal of impacted mandibular third molar.

A total number of 90 patients were divided into 3 groups. Group I received antibiotics administration for three days and starting one hour before the procedure. Group II received only single preoperative antibiotic dose administration one hour before surgical procedure and Group III did not receive any antibiotics. All operations were done under local anesthesia under similar conditions using a standardized technique.

In this study it was observed that prophylactic antibiotic administration for 3 days reduces the incidence of postoperative inflammatory and infectious complications such as pain, oedema, trismus and postoperative infection when it was given preoperatively.

Keywords: Prophylactic antibiotics, Impacted molars, Wisdom teeth.

INTRODUCTION

Removal of impacted third molar teeth is one of the most frequently performed surgical procedures. Rationale of prescribing antibiotics in practice is clearly important in high volume procedures such as third molar surgery[4]. Owing to the nature and environment of the surgery, inflammation and infection associated with bacterial contamination are the most common complications after third molar surgery. The other complications range from the expected and predictable ones such as swelling, pain, trismus, mild bleeding and dry socket to more severe complications such as inferior alveolar and lingual nerve damage, damage to adjacent tooth and fracture of the mandible. The overall incidence of infection from third molar removal has been reported to be in the range of3%to5%[5].

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*Correspondence Dr. Sadam Srinivasa Rao.
Department of Oral and Maxillofacial Surgery,
Army Institute of Dental Science, Secunderabad, Andhra Pradesh, India.
Email: drsreenu@yahoo.com

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While there is some evidence that antibiotic drugs can reduce the incidence of these postoperative complications, there is equally convincing evidence that they do not. We therefore designed a study to find out the role of antimicrobials in the removal of impacted third molars. The aims and objectives of this study were to evaluate and compare the postoperative inflammatory symptoms and infection rate after impacted third molar surgery with or without the use of antibiotic therapy' preoperarively and postoperatively.

MATERIALS AND METHODS

A total of 90 medically healthy patients between the age of 18 to 45 years with impacted mandibular third molars were selected randomly irrespective of sex, caste, religion and socio economic status etc. None of the patients had taken any antibiotics or anti-inflammatory drugs for 10 days before surgery. Subjects excluded from the study had pre-existing conditions that could affect wound healing or predispose them to inflammatory complications, including previous radiation therapy to the maxillofacial region and the patients allergic to penicillin. Radiographic evaluation was carried out in all cases before the surgical procedure. The patients selected underwent surgical extraction of impacted mandibular third molar and were equally and randomly divided into three groups according to the antibiotic administration.

Group I patients received antibiotic therapy one hour before the procedure and continued for three days post operatively.

Group II Single preoperative antibiotic dose was administered one hour before surgical procedure.

Group III No antibiotic administration was done which served as control group.

The antibiotics administered were Capsule Novaclox (amoxicillin and cloxacillin) 500mg and Tablet Metrogyl (metronidazole) 400mg. Preoperative data was recorded on a standard specified Performa. The patients were instructed not to take any drugs other than those prescribed and not to seek medical help elsewhere for postoperative problems. All operations were done under local anesthesia (2% lignocaine with adrenaline 1:80,000) in the same operating theatre with the same type of instruments and under similar conditions. The technique was standardized. Terrence ward's incision was given and mucoperiosteal flap elevated. Adequate amount of bone was removed from the buccal and distal aspect of the tooth with the help of bur. Sectioning of the tooth was done where indicated. Tooth was elevated and removed from socket. After achieving hemostasis, all wounds were closed primarily using 3.0 silk sutures. All patients were given post operative instructions and analgesics. The postoperative course was checked clinically on the second, fifth and tenth days postoperatively by the surgeon who had done the operation, and the postoperative symptoms were scored according to the evaluation criteria. The following details were recorded : Pain, swelling, trismus and Infection on the second, fifth and tenth days post operatively . Pain was recorded by Verbal Pain Scale, the patient was asked to rate their degree of pain using a 5-point Verbal Pain Scale (VPS).

0 No Pain

1 MildPain

2 Moderate Pain

3 Severe Pain

4 Very Severe/Unbearable Pain

Swelling was clinically assessed as increase in lateral cheek dimensions, measured in millimeters, the distance from tragal base to soft tissue gnathion with lips at rest.

Trismus was noticed by measuring in millimeters the interincisal distance between central incisal edges at maximum mouth opening and infection was assessed as presence of cellulitis and fluctuance.

RESULTS

In the present study 90 patients underwent surgical removal of impacted lower third molars.

Group I included 30 patients (18 males and 12 females) who received antibiotics for 3 days starting one hour preoperatively. The age range was 18-42 years (mean 32.2).

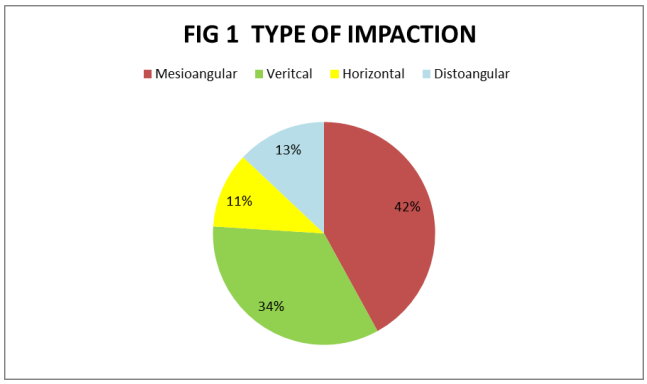

Fig 1: Type of impaction.

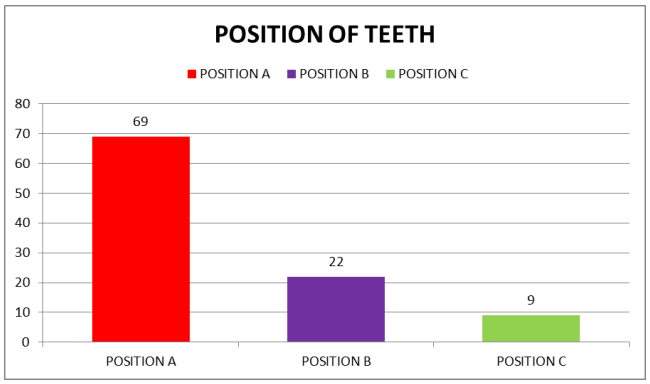

Fig 2: Position of tooth.

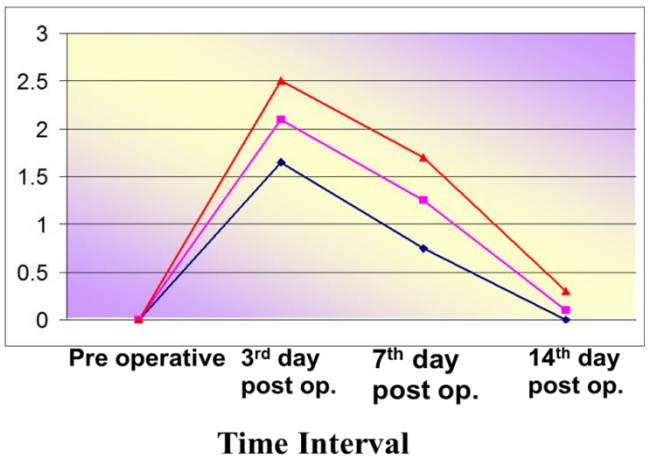

Fig 3: Comparison of flat.

Group II included 30 patients (17males and 13 females) whoreceived single preoperative antibiotic dose. The age range was between 19-40 years (mean 29.8).

Group III included 30 patients (14 males and 16 females) who were not prescribed any antibiotics with age ranging berween 18-39 years (mean 26.5).

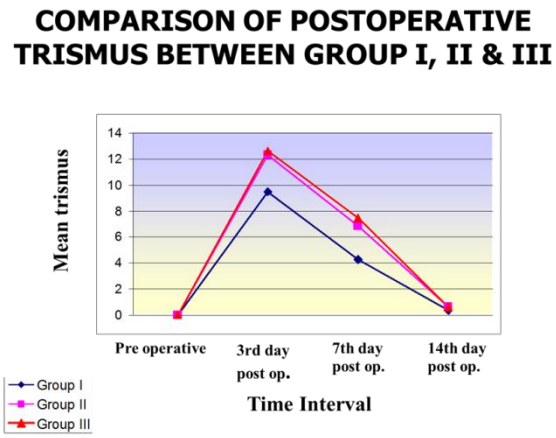

Fig 4: Comparison of postoperative trismus between group I, II and III.

All the impacted lower third molars in each group were classified according to Pell and Gregory and winter's classification (fig. 1). 76% of the teeth were in class I position, 24% in class II position. Teeth were also classified into Position A ,B and C (69% , 22% and 9%)respectively(fig. 2).

Comparison of mean value of pain in between group I & III and group I & II was statistically significant on 2nd and 5th days postoperatively. Whereas in between group II & III it was statistically non significant. Comparison of mean value of pain on 10th day postoperatively was non significant in all the three groups (fig. 3)

The difference in mean postoperative oedema was found to be statistically significant in group I & group III and group I & group II on 2nd and 5th days days postoperatively. There was no significant difference on 10th day postoperatively in all the three groups.

Trismus was found among all groups .The comparison of mean values of trismus between group I & II and group I & III were ($p < 0.05$) highly significant on 2nd and 5th days postoperatively and there was no statistically significant difference in all the three groups on 10th day postoperatively.

Presence/absence of infection was evaluated by observing cellulitis and fluctuance on 2nd and 5th and 10 th day postoperatively. lnfection was present in 5 cases in group II and in 7 cases in group III and 2 in group I on 10th postoperative day. The difference in p value between group II and

group III (p > 0.005) was statistically non-significant.

DISCUSSION

It is a common practice in third molar surgery to use antibiotics as a prophylactic therapy against the potential infection caused by susceptible microorganisms, although the timing and protocol vary widely Poeschl (2004)[6]. The use of antibiotic therapy in third molar surgery has been advocated by Mac Gregor and Addy (1980) [7] for the more difficult third molar impactions. In the present study it was observed that prophylactic antibiotic administration for 2 days reduces the incidence of postoperative inflammatory and infectious complications such as pain, oedema, trismus and postoperative infection when it was given preoperatively. Pain after third molar surgery is related to the healing process, and the healing process after the extraction of an impacted third molar depends on different variables such as surgeon experience, patient age, presence of periodontal pathology, and necessity for bone removal and tooth sectioning of the third molar if deeply impacted (Monaco G and Agostini R; 2009) [8] Pain was less in patients who received antibiotics as compared to patients who did not receive antibiotics. Comparison of mean pain on 10th day postoperatively was non significant in all the three groups. Postoperative inflammatory complications such as oedema and trismus were found to be less in group I as compared to group II and group III where single preoperative antibiotics dose and no antibiotics were used respectively. For the antibiotics to be effective in reducing the surgical complications, the timing of their use is very important. The antibiotic must be present in a therapeutic amount when the first incision is made and before surgery is completed to allow its effect on microbes that contaminate the surgical wounds and blood clots. This requires that the antibiotic be given approximately 1 hour before surgery [9,10] . The results of the present study confirmed the effectiveness of preoperative dosing and effectiveness of postoperative antibiotics for prevention of postoperative complications. Infection is one of the most common complications after third molar surgery. Ren andMalmstrom[1] in their study on the effectiveness of antibiotic prophylaxis in third molar surgery reported an effect of antibiotic therapy in reducing alveolar osteitis and wound infection after third molar extraction. The study of Lacasa et al[3] reported the same effect on wound infection and an amelioration of pain after postoperative antibiotic therapy.

In present study, Infection was recorded in cases with high Pedersen's difficulty index where more surgical trauma and more bone cutting was required. It was found that antibiotic administration for 3 days was efficacious in reducing the incidence of postoperative infection as compared to single preoperative dose of antibiotic. Age is commonly cited as a risk factor for post extraction complications like pain, swelling and trismus. This positive correlation may be related to increased bone density, which may result in more manipulation during the operation. In addition to changes in bone density increased age is associated with complete root formation and diminished wound healing capacities, which can result in post operative and inflammatory complications Bruce (1980) [11], Increased age (greater than 30) predispose to increased morbidity after third molar removal T. Yoshii (2001) [12]. Females had higher mean values of pain, oedema and trismus as compared to males but there was no statistically significant difference in between the three groups depending on sex. This is not in accordance with the studies of Monaco et al (1999)[13] and Ingibjorg, Wenzel (2004) [14] in which postoperative symptoms were found to be gender related. Single preoperative dose was not as efficacious as 3 days prophylactic antibiotic regime in reducing the postoperative symptoms. Patients who were not prescribed any antibiotic had higher incidence of postoperative complications as compared to the patients who were prescribed prophylactic antibiotic for three days.

SUMMARY AND CONCLUSION

Prophylactic antibiotics reduce the postoperative inflammatory and infectious complications after third molar surgery. In cases with age more than 25 years and impacted mandibular third molar with Pedersen's difficulry index of six and above, the preoperative use of antibiotics for third molar surgery should not be withheld and is justified. There is a general trend to overprescribe antibiotics and the use of antibiotic therapy without

appropriate indications can result in adverse outcomes. Some of the risks of indiscriminate antibiotic therapy include the development of resistant organisms, secondary infection, toxicity of the antibiotics and development of allergic reactions. The decision to use antibiotic prophylaxis in third molar surgery is ultimately the responsibility of the surgeon. All potential factors that may contribute to the postoperative complications should be taken into consideration and the advantages of prophylactic antibiotic in a patient must exceed the risk of adverse outcomes.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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