

ORIGINAL ARTICLE**PROPHYLACTIC USE OF ANTIBIOTIC IN MANDIBULAR THIRD MOLAR EXTRACTION: A CLINICAL STUDY**Vishal Halgatti¹, Santosh B S², Kiran Kumar³

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ABSTRACT:

Background: Surgical removal of mandibular third molars is one of the most frequently performed procedures in oral and maxillofacial surgery. This study was done to evaluate the benefits of antibiotic therapy in reducing post-operative complications after removal of asymptomatic mandibular impacted third molar teeth. **Methods:** This clinical study was conducted at Oral and Maxillofacial Surgery Department From Jan 2014 to Dec. 2015. It involved 100 patients with impacted mandibular 3rd molars which were divided randomly in to two groups of 50 each. Group I was prescribed Cap Amoxycillin 500 mg thrice daily for 5 days and Tab Metronidazole 400 mg thrice daily for 5 days after the surgical removal of mandibular third molars. Group II was not prescribed any antibiotic postoperatively. Post-operative complications like Pain, swelling, mouth opening was evaluated in all patients on 1st day, 3rd day, 7th day and 10th day.

Results: Post-operative complications in both groups did not show statistically significant difference. **Conclusions:** The study showed that antibiotic didn't have a significant role in reducing postoperative complications after removal of asymptomatic impacted 3rd molar.

Key Words: Antibiotic, Impacted 3rd molar, post-operative complications, antibiotic.

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INTRODUCTION

Mandibular third molar is most commonly impacted tooth. Surgical removal of mandibular third molars is one of the most frequently performed procedures in oral and maxillofacial surgery.

The most frequent complication which follows the removal of impacted mandibular third molars is 'dry socket'. Some degree of swelling, trismus and pain,

unless they are related to infection or excessive trauma, must be regarded as a normal response to surgery.¹

Risk factors for postoperative complications have been assessed and patient age as well as gender, oral contraceptives, smoking, oral hygiene, difficulty of surgery, tooth anatomy and position, therapeutic or prophylactic indication for extraction, wound

management, and surgical experience are reported to influence postoperative complication rates.²

Prophylactic antibiotic therapy is defined as 'the administration of any antimicrobial agent that prevents the development of disease'; the antibiotic must be present in the systemic circulation at a high level at the time of surgery and is usually given as one dose.³

Although third molar surgery may usually be considered clean-contaminated and occasionally contaminated surgery, the use of routine antibiotic prophylaxis in patients undergoing such surgery is a controversial topic.⁴ It is common practice in oral and maxillofacial surgery to use antibiotics after third molar surgery. While there is some evidence on the fact that these drugs can reduce the incidence of postoperative complications, there is equally convincing evidence that they do not.⁵

The aim of this clinical study is to determine the use of antibiotic prophylaxis prior to surgical removal of mandibular third molar teeth to prevent post-operative infections.

MATERIALS AND METHODS

This study was conducted in department of Oral and Maxillofacial surgery from Jan 2014 to Dec 2015. Patients who require surgical extraction of mandibular third molar were selected and randomly divided into two groups of 50 each by using a simple, random sampling technique. Ethical clearance was obtained from institutional ethical committee and patients were informed about the study and written consent was taken in their language. Both the groups underwent surgical removals of asymptomatic mandibular third molars under local anaesthesia by using strict aseptic techniques, with only minimal trauma being caused to the surrounding tissues. Group I was prescribed Cap Amoxicillin 500 mg thrice daily for 5 days and Tab Metronidazole 400 mg thrice daily for 5 days after the surgical removal of mandibular third molars.

Group II was not prescribed any antibiotic postoperatively. However, both the groups were prescribed anti-inflammatory drugs and analgesics. Both the groups were assessed postoperatively on the 1st, 3rd, 7th and 10th days by the same observer for post operative mouth opening (interincisal distance), presence of a purulent discharge at the site of surgery, pain and swelling.

ASSESSMENT OF MOUTH OPENING

Post operative mouth opening ie interincisal distance was recorded in millimetres by using vernier calipers.

ASSESSMENT OF PAIN

Post operative pain was assessed by using a four-point Visual Analogue Scale (VAS)⁶ which was-
0 = no pain

1 = mild pain (pain being reported only in response to questioning and without any behavioural signs)

2 = moderate pain (pain being reported in response to questioning and accompanied by signs, or pain being reported spontaneously without questioning)

3 = severe pain (a strong vocal response or a response which was accompanied by grimaces, withdrawal of the arm, or tears).

ASSESSMENT OF SWELLING

Swelling and purulent discharge at the site of surgery were recorded as present or absent.

Subjective assessment of swelling was based on a 4-point scale.

1 = no swelling,

2 = mild swelling (intraoral swelling and edema of the operated zone),

3 = moderate swelling (intraoral and extraoral swelling and edema),

4 = severe swelling (intraoral, extraoral and facial swelling and edema).

Such swelling was measured by both the patient and one of the investigators.

Swelling was evaluated as follows: Four points on the patient's face were marked. The points were the middle points of the tragus, gonion of the soft tissue, angle of mouth and external cantus of the eyes. Three lines (tragus gonion, outer cantus-gonion, tragus-angle of mouth) were measured before and after each surgical operation. The differences between these dimensions showed the average amount of swelling. The measurements were made before the operation and again two and seven days after extraction, using a nonextensible measuring tape. Results thus obtained were tabulated and subjected to statistical analysis. P-value less than 0.05 were accepted as significant.

RESULTS

The present study was conducted on 100 patients with 80 impacted mandibular third molars. Following results were obtained.

Table I: Assessment of mouth opening

Assessment time	Group I	Group II	P value
	Mean +/- SD	Mean +/- SD	
Pre- op	40.5+/-4.7	41.4+/-4.3	p> 0.05
1 st day	25.7+/-4.1	36.7+/-4.5	P<0.01
3 rd day	32.4+/-4.1	37.3+/-5.2	p> 0.05
7 th day	37.2+/-3.7	38.5+/-4.4	p> 0.05
10 th day	41.9+/-4.0	40.6+/-5.9	p> 0.05

Table II: Assessment of pain

Group	Pre-op	1 st day	3 rd day	7 th day	10 th day
Group I	3	2	1	1	1
Group II	3	2	2	2	1

Table IV: Assessment of swelling

Group	Pre-op	1 st day	3 rd day	7 th day	10 th day
Group I	3	2	1.5	1	1
Group II	4	3	2.5	2	1

Table I shows assessment of mouth opening. The interincisal distance were measured in mm pre-operatively, 1st day, 3rd day, 7th day and 10th day. Group I showed more mouth opening as compare to group II. However results were non significant.

Table II shows assessment of pain using visual analogue scale (VAS). Group I showed more reduction in pain as compare to group II.

Table IV shows assessment of swelling. Group I showed better improvement in swelling reduction as compare to group II.

DISCUSSION

The surgical removal of an impacted mandibular third molar is considered as one of the most frequent minor procedures performed in oral and maxillofacial surgery. Many studies have been done with regard to surgical technique, antibiotic therapy and post operative evaluation to assess patient comfort and wound healing, but still there exist a diverse opinion with third molar.⁷

In this study, we evaluated mouth opening (interincisal distance), assessment of pain and swelling postoperatively between the antibiotic (group I) and non antibiotic groups (group II). Peterson set the following five principles of antibiotic prophylaxis:⁸

- 1) The surgical procedure should have a significant risk of infection.
- 2) The correct antibiotic for the surgical procedure should be selected.
- 3) The antibiotic level must be high.

4) The timing of the antibiotic administration must be correct.

5) The shortest antibiotic exposure must be employed.

In the literature, the use of antibiotics either systemically or locally is suggested in order to minimize postoperative complications. Systemically, amoxicillin and the combination with clavulanic acid, clindamycin or metronidazole, and combinations of various dosages are used.⁹ In this study we used Cap Amoxycillin 500 mg thrice daily for 5 days and Tab Metronidazole 400 mg thrice daily for 5 days.

The current literature does not support the routine use of antibiotic prophylaxis in patients undergoing surgical removal of teeth including wisdom teeth. A recent Cochrane review suggests that there is moderate evidence to support prophylaxis use to reduce the risk of dry socket (alveolar osteitis) and post-operative infection of surgical sites.¹⁰ This evidence does not however outweigh the risks associated with the use of antibiotics such as anaphylactic reactions and the development of resistant bacteria, and therefore antibiotics must not be prescribed routinely. The Cochrane review only refers to post-operative antibiotic therapy and there is no mention to the use of pre-operative antibiotic prophylaxis.¹¹

Postoperative complications after wisdom tooth extractions as alveolar osteitis or surgical site infection may appear. Alveolar osteitis (AO), alveolitis sicca, or dry socket are synonyms of the most common postoperative complication after

mandibular third molar extractions. However in present study, none of the patient showed signs of dry socket.¹²

In studies done by Sekhar et al¹³, no significant differences were seen among the groups in terms of pain, mouth opening and swelling and hence, they failed to show any advantage which was associated with routine preoperative or postoperative use of antibiotics during removal of third molars.

In the present study, the interincisal distance were measured in mm pre-operatively, 1st day, 3rd day, 7th day and 10th day. Group I showed more mouth opening as compare to group II. However results were non significant.

It was seen that pain was maximum following surgery, which was possibly caused by the trauma which was caused by the surgery. It gradually reduced, with all the patients having mild pain in 3rd postoperative day in group I, while group II patients had mild pain at 10th day.

In the present study, it was found that swelling was seen postoperatively in all the patients. In group I swelling gradually reduced in 3rd day while in group II, it was minimum in 10th day.

In considering the question "should antibiotics be used for third molar surgery?" one can give at least five possible reasons. Use antibiotics when¹⁴-

- 1) An infection is present that must be treated.
- 2) The patient is medically compromised and requires antibiotic prophylaxis against metastatic infection.
- 3) The patient or the patient's family demands antibiotics
- 4) The standard of care in the oral surgery community is to use antibiotics and hence not to use them violates this standard.
- 5) The risk of postoperative infection is high and consequently prophylaxis is needed.

There is increased concern about the misuse of antibiotic during the removal of impacted 3rd molars. We found no significant difference between the two groups regarding the variables evaluated and our result showed that routine use of antibiotics is unwarranted for removal of impacted 3rd molars in healthy patients.

CONCLUSION

Author concluded that Antibiotics regimen for the removal of mandibular third molar extraction does not

provide additional benefit in reducing post operative complications.

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