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Research Article

The Evaluation of Antibiotic Therapy on Postoperative Complications Aftermandibular Third Molar Extraction

Farnoush Mohammadi[1], Mehrnoush Momeni roochi*[2], Hamed zahedi pour[3]

Samira Mortezazadeh[4]and Mohsen Rashidi[5]

[1]Department of Craniomaxillofacial Research center,
Tehran University of Medical Sciences, Tehran, Iran.
Oral and Maxillofacial Surgery Department, School of Dentistry,
Tehran University of Medical Sciences, Tehran, Iran.
[2]Department of Oral and maxillofacial Surgery,
Tehran University of Medical Sciences, Tehran, Iran
[3]Department of Craniomaxillofacial Research center,
Tehran University of Medical Sciences, Tehran, Iran.
[4]Department of Craniomaxillofacial Research center,
Tehran University of Medical Sciences, Tehran, Iran.
[5]Department of Pharmacology, School of Nursing & Midwifery,
Shahid Beheshti University of Medical Sciences, Tehran, Iran.

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Corresponding author: Mehrnoush Momeni roochi, Fax:+98 21 22 43 97 70 Mehrnoushmomeni@yahoo.com

ABSTRACT

Introduction: common application of antibiotic therapy in patients undergoing mandibular third molar surgery is a subject of discussion and todays this operation has become a common affair, although it has not generality. Few studies support this subject; in contrast many studies also consider this subject a type of cost imposition on the patients that does not have any health benefits such as decreasing of post-operation complications. The aim of this study was to evaluate the effect of post-operative antibiotic therapy after mandibular third molar surgery in order to reduction of postoperative complications.

Materials and methods: 142 patients underwent mandibular third molar surgery, at the university during years. The patients were divided into two control and intervention group that intervention group underwent antibiotic therapy with amoxicillin for 5 days after surgery. The control group also, received placebo for 5 days. Clinical factors such as pain severity, the rate of swelling and fever in the second and seventh days after surgery were evaluated. Prescription

Results: the results showed that there is no significant difference between pain severity in both groups on second and seventh days ($P>0.05$) although pain severity had been significantly decreased on seventh day comparing to the second day after operation ($P<0.05$). there was no significant difference between the two groups, and on the second day after the surgery, 4 patients in antibiotic group (5.6%) and 3 patients in control group (4.2%) had fever, while none of patients of both groups had fever on seventh day.

Conclusion: the results of the present study showed that post-operative antibiotic therapy after mandibularthird molar tooth in systemically health patients, do not have any effects on pain severity, rate of swelling and fever. Therefore, the common application of post-operative antibiotic therapy after themandibular third molar tooth is not suggested for reduction of infection.

Keywords: antibiotic, placebo, third molar tooth, infection, swelling

INTRODUCTION:

Pulling the wisdom tooth is one of the most common types of tooth surgery that annually 20-100,000 patients undergoing this surgery in European countries[1]. Based on studies, the

prevalence of molar caught teeth which is the major agent of extracting of hidden wisdom tooth, is between 17 to 69%[2-5]. According to study of Hashemipour et al. (2012) the prevalence of wisdom caught tooth is 44.3% in Iran[6], since not extracting of these teeth from jaw leads to complications such as gnawing of roots of adjacent teeth, injury of periodontal tissues and rottenness of adjacent teeth and creation of cyst, tumor. Given the mentioned notes, it seems that the best therapeutic method in these cases is extracting of these teeth[7].

Post-operativecomplications of hidden third molar tooth are pain, lockjaw swelling, infection which are occurred because of trauma inserted on tissues. These complications are appeared in all patients with various severity after surgery of wisdom tooth [8]. The percentage of coughed wisdom tooth incidence at the mandible is reported 17.5% and in maxilla was 21.9% [9]. With regards to the complications caused by extraction of these teeth and the surgery pain on daily activities of patients (90% of patients face moderate to severe pains after surgery of wisdom tooth) and given that removing of pain and discomfort of patients is one of the important aims of dentistry, various studies are conducted during long years in order to discover an appropriate narcotic with minimum side effects [10, 11]. At the moment , drugs such as non-steroidal anti-inflammatory drugs (NSAIDs), narcotics, antibiotics and corticosteroids are available in order to reduction of pain and side effects [8].

Antibiotics are one of the most common group of drugs which are used by dentist in cases of mandibulartthird molar teeth surgeries with the purpose of reduction of infection risk and post-operative infections[12], although according to previous studies, antibiotic therapy is necessary only in cases in which the patient is at a high risk of infection. However, various studies have indicated the contradictory effects of antibiotics as an agent in reduction of mandibular third molar teeth surgery complications[13, 14], with regards to the mentioned notes, the aim of the present study was to evaluate the effect of amoxicillin 500 on complications caused by the above surgery.

Study method:

The present study was a randomized triple-blinded clinical trial in which the referred patients to dentistry clinic of Tehran University of medical sciences, Iran during 2015-2016 were divided into two antibiotic (drug receiving) and control (placebo receiving) groups.

Surgery process

Firstly, local anesthesia of inferior alveolar buccal lingual nerves of patients was performed with injection of 3 carboles of lidocaine 2% with 1/100000 epinephrine, and a triangular flap of mesial part of 7^{th} to distobuccal teeth of wisdom teeth was provided, the duration of surgery was less than 30 minutes. After surgery, the surgery area was eluted by 50 cc of normal saline and the location was sutured with silk (3-0) suture by continuous method.

Post-operative medicinal treatment in both groups

In antibiotic group, amoxicillin 500 and ibuprofen 400 were prescribed for the patients (for 5 days every 8 hours) and in control group, placebo and ibuprofen 400 were given to the patients (for 3 days every 6 hours).

The evaluation of pain severity, swelling rate and fever

The pain severity of patients was measured using VAS-score at second and seventh post-operative days, the swelling rate was measured at the second and fourth days using flexible ruler with accuracy of 1 millimeter like figure 1, count us of eye to angle of mandible, and commissure of lip to lob of ear. Two measurements were performed for each patients by two persons and their averages were recorded. The fever of patients was evaluated using a thermometer at the second and seventh days after the surgery.

Data analysis

Quantitative data was reported as mean ± SD and qualitative data was reported based on frequency. T-test was used for comparison of quantitative data between the two groups and fisher test was used for qualitative data. The significance level was recorded below than 0.05.

RESULTS

At the present study, 142 patients who had passed the surgery of mandibular third molar tooth were divided equally into two groups include antibiotic (drug receiving) and control (placebo receiving) groups. The average age of patients in amoxicillin group was 23.2±3.4 years and the average age of control group was 23.7±3.7 years and there was no significant difference between the two groups for age and gender.

Pain severity, swelling rate and fever

In the present study, the severity of pain in patients was evaluated using VAS index at the second and seventh days after surgery, the results showed that there was no significant difference between the average of pain severity in both groups at the second and seventh days (P>0.05), although the pain severity at seventh day was significantly decreased comparing to the second days after surgery (P<0.05) (table 1, diagram 1), there was no significant difference between the two groups for swelling rate, at the second day after the surgery, 4 patients in antibioticgroup (5.6%) and 3 patients in control group (4.2%) had fever, while none of the patients had fever at the seventh day after surgery.

Table 1- the comparison of the evaluated parameters in both control and antibiotic groups

Parameters		Antibiotic group	Control group
VAS-score in 2th		5.41 ± 1.91	5.39 ± 1.96
Vas-score in 7th		1.93 ± 1.26	1.86 ± 1.37
Swelling		1.14 ± 0.06	1.15 ± 0.05
Fever	Yes	4 (5.6%)	3 (4.2%)
	No	67 (94.4 %)	68 (95.8%)

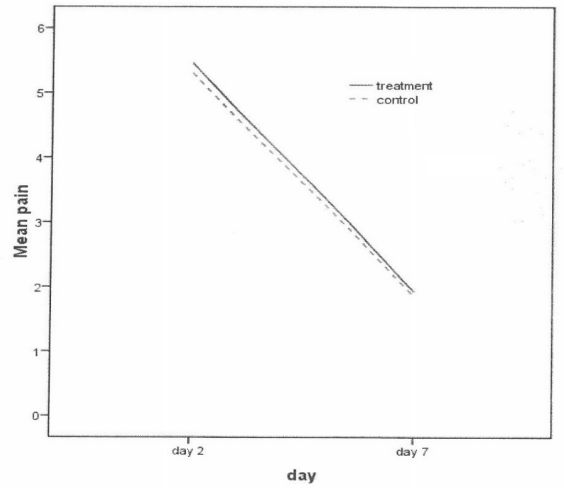

Diagram1- the mean pain severity of patients in both groups at the second and fourth days after the surgery

The correlation between age and gender with pain, swelling and fever severity

There was no significant correlation between age and pain severity at the second (P=0.67) and seventh (P=0.27) days. Also, there was no significant correlation observed between age with swelling (P=0.16) and fever (P=0.57). On the other hand, there was a significant correlation between gender with pain severity (P<0.001) and swelling (P<0.001) and the pain and fever severity were significantly higher in females comparing to males (P<0.001), but there was no significant correlation between gender and fever in both groups.

DISCUSSION

In the present study, pain, swelling and fever severity were studies at the patients who had passed the surgery of mandibular third molar tooth in both amoxicillin and placebo receiving groups, our results showed that there was no significant difference between the two groups for severity of pain, swelling and fever.

Different studies have been conducted about the evaluation of antibiotic therapy by dentists. Lauber and coworkers 2000 showed in their study that only 60% of dentists pay attention to the infection predisposing background disease of patients during antibiotic therapy, and the most common antibiotic prescribed by the dentists has been amoxicillin [14]. In a similar study, Ramezanian 2001 showed that the prescription of ampicillin does not create a significant difference in prevention of infection and swelling at the early days after surgery comparing to the control group, but it causes a significant decrease in infection and swelling rate at the seventh day after surgery comparing to the control group [13], these findings were not consistent with results of our study, the reason for this difference can be attributed to the sample size under evaluation and type of consumed drug.

In Sekhar et al. study 2001, 151 patients were divided into three groups including placebo receiving group, group receiving 1 gram metronidazole one hour before surgery and

group receiving 400 milligram metronidazole after surgery, in order to evaluate the effect of metronidazole on swelling and pain severity after molar teeth surgery. The results of their study showed that the prescription of metronidazole as an antibiotic, before and after surgery has not any effect on pain severity and swelling rate [15]. These results were parallel with results of our study.

Siddiqi et al. (2010) evaluated the pre-operative effect of prophylaxis antibiotic prescription on pain severity, swelling, temperature, infection rate, trismus. For this purpose they divided 100 patients into two drug and placebo receiving groups, and evaluated pain severity, swelling, temperature and trismus at 3th, 7^{th}, and 14^{th} days after surgery. Their results showed that prescription of prophylaxis antibiotic after the molar surgery has no significant effect on measured indices in their study[16]. These results were consistent with results of our study.

The results of our study showed that there was no significant correlation between gender with swelling rate and pain, as the measured swelling and pain rate revealed by the patients were higher in women comparing to men. However, there was no correlation between gender and fever of patients. Also, in our study, the lack of effect of age on fever, pain severity and swelling has been found. The direct effect of female gender with increasing of pain has been proved in a study similar to ours conducted by Monaco et al 1999 in Italy Bolonga university which was performed as a comparative study between control and group receiving amoxicillin 5 days after surgery. While, no obvious effect has been observed in prevention of post-operative complications in these two groups[17].

CONCLUSION:

The overall conclusion arising from our study is that the prescription of 500 mg amoxicillin, 3 times a day for 5 days, after surgery has no effect on decreasing of post-operative complications. From the results of our study and similar studies it can be resulted that regardless of type of selected antibiotic, the prescription of antibiotic has no effect on prevention of infection, fever, decreasing of pain and swelling in systemically healthy patients and non-difficult surgeries, on the other hand, with regards to other studies indicating high tendency of dentists to prescription of mandibular third molar tooth post-operative prophylactic antibiotics and this fact that the most common prescribed antibiotic is amoxicillin, designing and performing of supplementary educational programs is an important issue in order to improvement of their attitude and function in modality of antibiotic prescription with regards to predisposing of individuals to creating of resistant strains and other complications of antibiotics.

AUTHORS' CONTRIBUTIONS

All authors had equal role in design, work, statistical analysis and manuscript writing.

CONFLICT OF INTEREST

The authors declare no conflict of interest

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