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A Systematic Review to Evaluate the Role of Antibiotics in Third Molar Extraction

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ABSTRACT

Background(s):

[Third molar extraction has become a frequent surgical practice for dentist. To minimize the post extraction infection, antibiotics prescription is usually given. However, excessive antibiotics usage may also lead to several adverse reaction and bacterial resistance.]

Objective(s)

[This study is to understand the advantages and the risk of antibiotics prescription on third molar removal treatment.]

Method(s):

[A systematic research was done on PubMed, SpringerLink, ScienceDirect, EBSCO and Wiley using the search term (“Odontectomy” OR “Third molar extraction”) AND (“Antibiotics”). For this study, 92 articles were examined and only 7 were selected for this review. The Preferred Reporting Item for Systematic Review and Meta-Analyses (PRISMA) guidelines was used.]

Main finding(s):

[Antibiotics such as clindamycin and penicillin reduce trismus, swelling and pain after postoperative compared to placebo. Patient’s quality of life is also slightly better in patients who were prescribed amoxicillin after surgery. Amoxicillin also reduces postoperative infections such as alveolar osteitis and dry socket.]

Conclusion(s):

[Antibiotics are still preferable to be given after third molar extraction. Proper extraction method and drug dosage must be fully understood by the operator to minimize infection and the drug’s adverse effect.]

Keywords:

[antibiotics, postoperative infection, third molar extraction]

BACKGROUND(s)

[Third molar extraction is a common procedure in dental practice. The prevalence of third molar impaction is 24% throughout the globe.¹ This procedure has several postoperative complications such as alveolitis, bleeding, infection, and nerve damage.² Dentist usually prescribe patients with preoperative prophylaxis antibiotics although it showed no significant difference in preventing the complications.³

Antibiotic is used as antimicrobial agent for bacteria. In dentistry, it can be prophylaxis which is given to prevent infection or therapeutic which is used to resolve the undergoing infection.⁴ It is usually given in cases with bleeding to prevent bacteremia. Furthermore, antibiotic prophylaxis is needed for patients with endocarditis, immunocompromised condition, organ failure and pregnancy.⁵ Amoxicillin is the most prescribed by dentist.⁶

Over-prescription of antibiotics may lead in bacterial resistance such as *Clostridium difficile*.⁷ In 2015, World Health Organization (WHO) released worldwide plan to resolve the antimicrobial resistance problems.⁸ One of the suggestions is to prescribe antibiotics according to the definitive diagnosis. This study aims to understand the importance of antibiotics prescription after third molar extraction. Hence, minimizing the adverse effect of antibiotics in dental practice.]

METHOD(s)

[A systematic review was conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA).⁹

Search Strategy

A systematic literature search was performed on five databases: PubMed, SpringerLink, ScienceDirect, EBSCO and Wiley to retrieve potential eligible articles published from over the last 5 years up to July

2022. ¹ A search string was created on the basis of the PICO model. The string (“Odontectomy” OR “Third molar extraction”) AND (“Antibiotics”) was launched on the databases.

Inclusion/exclusion criteria

The included studies were all full text article in human studies written in English. Article database included medicine, dentistry, oral maxillofacial surgery, health and medical collection. The exclusion criteria were animal, modelling and in vitro studies. Review article were also excluded (Figure 1).

Study Selection

All identified references were organized and four reviewers (R.A.H, S.S, S.B.G, and P.N) independently screened the article first by titles and abstracts then based on full texts. Disagreements on the eligibility of articles were resolved by discussion between reviewers.]

MAIN FINDING(S)

[Antibiotics play a big role in the treatment of third molar surgery. Almost all dentist prescribe antibiotics as number one pro-drug to prevent infection after third molar surgery. Antibiotics can decrease post-operative pain and analgesic consumption after removal of third molar surgery.¹⁰⁻¹³ Trismus, dry socket, or alveolar osteitis, and edema are the example of post-operative pain.^{11,13,14} Antibiotics that dentist usually used to prevent the infection are amoxicillin and clindamycin.^{10-13,15} Both antibiotics can reduce the pain and prevent infection. Others also stated that patient who use antibiotics after third molar surgery improved their Quality of Life.¹²

Antibiotics often compared with placebo and NSAID, and it is found that antibiotics still effective in preventing pain.^{11,14} However, long term use of antibiotics can affect the antibiotic resistant bacteria,

so dentists need to use antibiotics rationally.¹⁶ Antibiotics can also reduce swelling mainly caused by bacteria (Table 1).¹⁴ Therefore, antibiotics are still very useful to be used after third molar surgery.]

CONCLUSION(s)

[Clinicians must establish an adequate diagnosis to understand the risk of infection and complication. Antibiotics minimize the risk of postoperative complications such as dry socket, pain and swelling. This shows that antibiotics prescription is still recommended after third molar extraction. Prophylactic antibiotics should only be given to patient with medical compromises.]

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TABLES

Table 1. [Paper Results]

Author, Year	Type of Study	Subjects	Relevant findings
Donmezer et al, 2021 ¹⁰	Research article	Local antibiotics, systemic antibiotics, impacted third molar surgery	Both statistically decreasing pain and analgesic consumption, the results of local and systemic antibiotic therapy with the use of Platelet Rich Fibrin (PRF) following removal of the mandibular third molar were comparable
Yanine et al, 2021 ¹¹	Research article	Antibiotic prophylaxis, impacted third molar tooth extraction	When compared to a placebo, the use of 2 grams of amoxicillin after third molar surgery can decrease bacterial contamination and reduce postoperative pain
Braimah et al, 2017 ¹²	Research article	Oral antibiotics, quality of life, third molar surgery	Following third molar surgery, there was a major decline in Quality of Life (QoL), especially in postoperative day (POD) 1 and 3. By the seventh day, however, it had gradually restored to its preoperative level. Additionally, it was found that QoL was marginally improved in the extended amoxicillin/clavulanic group compared to the single bolus levofloxacin and amoxicillin/clavulanic groups
Khooharo et al, 2021 ¹³	Research article	Dry socket, mandibular third molar, amoxicillin	Amoxicillin can reduce infection and dry socket after third molar extraction
Momeni et al, 2021 ¹⁴	Research article	Mandibular impacted third molar, amoxicillin	Antibiotic treatment can prevent the after effect of third molar surgery
Janas-Naze et al, 2022 ¹⁵	Research article	Clindamycin, third molar extraction, efficacy	Lower clindamycin dosages given over shorter time periods are effective in alleviating pain and minimizing post-operative complications after third molar surgery
Jung et al, 2019 ¹⁶	Research article	Odontogenic infection, extraction maxillary molars, metronidazole	Antibiotic therapy is effective to prevent bacterial infection.

FIGURES

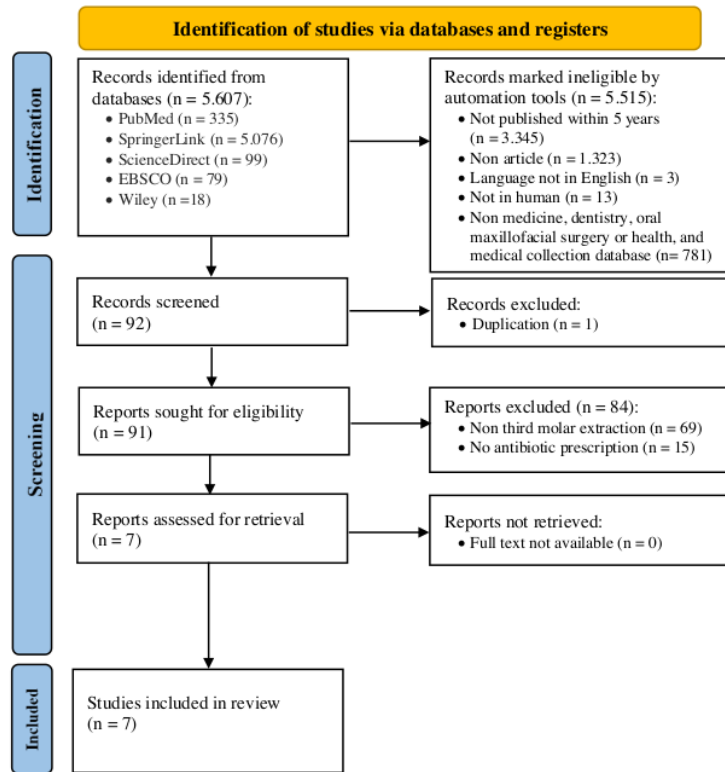


Figure 1. [Flow chart of review process]

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