Role of Metronidazole In Treatment of Pericoronitis: Systematic Review.

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ABSTRACT  
Objectives: The purpose of this study was to evaluate the predominant flora associated with pericoronitis in third molars and to investigate the role of metronidazole in controlling the situation.  
Subject and methods: The search was carried out by two individuals using various electronic databases: MEDLINE (PubMed), ScienceDirect, and ResearchGate. In the English literature, clinical studies reporting the role of metronidazole in management of pericoronitis. The search terms were used, alone or in combination were "pericoronitis", "molar impaction", "oral infection" metronidazole".  
Results: Initial of titles leads to 97 abstracts. 69 abstracts were excluded, so 28 full texts were obtained complete papers were evaluated for inclusion/exclusion criteria in the first phase. Of these 28 studies, 16 studies were excluded and 12 studies went through the first review stage. During the second review stage, 5 studies were excluded and studies were deemed to have met the inclusion criteria. After studies of the same cohorts were excluded, 7 studies were finally selected.  
Conclusion: These results highlight (1) the diversity of the microflora associated with pericoronitis and the importance of the anaerobic flora (2) metronidazole plays an important role in pericoronitis management.  
Keywords: metronidazole, infections, pericoronitis, third molar.

I. INTRODUCTION  
Diseases are located in the head and neck, which usually emerge from odontogenic tissues, ought to be taken care of with each feeling of desperation; generally, inside a brief timeframe, they will bring about intense crises. This is a result of the many associated spaces, upgrading a quick spread of irritation in the area(1-7). Impacted third molars are related with dangers of many issue and confusions, (8) including pericoronitis, caries, resorption and periodontal problems(9) Pericoronitis is characterized as irritation in the delicate tissues encompassing the crown of a mostly ejected tooth. It by and large does not emerge in teeth that eject regularly; more often than not, it is found in teeth that emit gradually or wind up noticeably affected, and it most usually influences the lower third molar. Once the follicle of the tooth speaks with the oral hole, it is felt that bacterial entrance into the follicular space starts the contamination(10) Prevalent bacterial types of pericoronitis of ejecting mandibular third molars are Streptococcus, Actinomyces and Propionibacterium species, and also beta lactamase-delivering microbes, for example, Prevotella, Bacteroides, Fusobacterium, Capnocytophaga, and Staphylococcus sp., (11, 12) The recognizable proof of these verdure and an information of the fact that they are so helpless to anti-infection agents are important to adjust the treatment. The verdure have been portrayed by photon microscopy as like those of intense necrotizing ulcerative gingivitis. Three treatment strategies depend on the seriousness: torment and disease administration,
minor surgery to expel the covering gum tissue (operculectomy), and evacuation of the tooth. Operculectomy, which comprises of expulsion of operculum, is shown when the tooth is as yet valuable. This enables better access to clean the zone and keep the aggregation of microscopic organisms and nourishment trash (15). The aim of this review is systematically efficiency of metronidazole in managing of pericoronitis.

II. MATERIALS AND METHODS

A review tradition was composed on the preface of the principles proposed by the PRISMA clarification and the Cochrane Collaboration (16) The survey address, targets of the review, qualification criteria, inquiry and information examination system were unmistakably expressed ahead of time and joined in the convention's substance. The qualification criteria, characterizing the incorporation and prohibition criteria of the efficient survey, incorporated the accompanying parts:

Samples
Individuals with pericoronial tissue infections impacted lower third molars. Individuals with no systematic disease

Outcomes
Bacterial responses against metronidazole antibiotics

Types of articles
Randomized controlled clinical trial (RCT), cohort and crossover studies, master supposition papers were taken to avoid bias (17) In vitro and animal studies, systematic reviews, and clinical reviews that allude to techniques for biting capacity assessment, which were incorporated. Dialect: papers written in English.

Production status: all articles include in study had been downloaded

2.1. Search strategy
The search was carried out by two individuals using various electronic databases: MEDLINE (PubMed), ScienceDirect, and ResearchGate. In the English-literature, clinical studies role of metronidazole of treatment of pericoronitis. The search terms were used, alone or in combination were “metronidazole”, “pericoronitis”, “impaction” systematic review”, “The search covered a time span from January 1996 to October 2016.

2.2. Study selection
The review method carried out in two stages: in the first stage, abstracts and/or full texts were screened by the two reviewers. Initially, titles were searched for relevance, and the abstracts of the relevant articles were obtained. The papers obtained were investigated using the exclusion and inclusion principles. Articles that were technical articles, or were in language other than English or had no English-language abstract were excluded. The included full papers were further screened separately by the two researchers in the second phase of review using the inclusion criteria:

1. Studies conducted on the management of pericoronitis.
2. Studies included lower molar impaction

Exclusion criteria
1- Non-human study.
2- Studies utilize non antibiotics treatment strategies.

2.3. Assessment of bias in individual studies
All of the included surveys was requested by the Oxford Center for Evidence-based Medicine levels of affirmation. Each was assessed for potential inside methodological inclination.

2.4. Data extraction
Information with respect to study outline, the quantity of members, duration of clinical findings, kind of lesions and it is seriousness and kind of instruments utilized were chosen from the included studies. This review article conveyed a fundamental illustrative abstract and illumination of the qualities and disclosures of the chosen articles (18). Information were organized in tabular form to encourage the introduction and evaluation of the current proof.
III. RESULTS

1. Search strategy followed

Figure 1 shows the method used to determine the studies finally included from the initial yield of 550 titles. Initial f of titles leads to 97 abstracts. 69 abstracts were excluded, so 28 full texts were obtained complete papers were evaluated for inclusion/exclusion criteria in the first phase. Of these 28 studies, 16 studies were excluded and 12 studies went through the first review stage. During the second review stage, 5 studies were excluded and studies were deemed to have met the inclusion criteria. After studies of the same cohorts were excluded, 7 studies were finally selected.

2. Analysis of the characteristics of the included studies

Properties and the principal results of the 7 included papers used are defined in two tables. Current study concerned the Effective Metronidazole activity against bacterial culture isolated from pericoronitis in table 1 while table 2 content most effective Metronidazole with other antibiotic activity against bacterial culture isolated from pericoronitis.

IV. DISCUSSION

Pericoronitis is an irritation of the gingival tissue encompassing molar teeth, for example, an affected shrewdness tooth, or somewhat ejected tooth. Pericoronitis can create when somewhat emitting tooth get through gingival tissue, enabling microbes to enter through the opening. Nourishment or plaque might be caught underneath a fold of gingiva around the tooth, chafe the gingiva and prompt pericoronitis (19). With the approach of anti-infection agents and enhanced financial gauges, the spread of odontogenic contaminations is declining not just in Europe and America (7).

In the investigation worry with deciding the most pervilantbactreia sort found in pericoral tissue around fractional erupted uncovered that Viridans, Actinomyces and Prevotella (12). Rajasuo et al found that Aggregatibacter actinomycetemcomitans is one of the most common types of bacteria found in pericoronitis this run with the findings showed by (12)Sixou et al although (12)Sixou et al used nonselective media and (20)Rajasuo et al used Eppendorff tube media their results are similar. On the other hand, (21)Microbiology of mandibular third molar pericoronitis: Incidence of -lactamase–producing bacteria find that Obligate anaerobes were present in 21 of the 26 samples. The bacteria most commonly detected were -hemolytic streptococci (26/26). The result was slightly different results can be explained by the use of different type of bacterial culturing media (Brucella agar containing 5% sheep blood enriched with vitamin K1 (1 mg/L) and hemin (10 mg/L). In another study using sheep bleed agar plates as culture media, Of the grampositive cocci, Streptococcus was the microorganism most frequently colonizing (22).

On the clinical studies that investigating the effect of different antibiotic regimen on pericoronal bacteria, (23) find using metronidazole, 500 mg, every 8 hours within 5 days to 1 week. Can control the infection (infection had not spread to the neck and chest wall). This run in agree with a retrospective study developed by (24)Mahmoodiet al which revealed Metronidazole is effective in treatment of pericoritis, another interesting study concerning the effectiveness of metronidazole as prophylaxis against dry socket, (25) find that using Metronidazole 1600 mg (four 400-mg tablets) The patients were given the tablets by mouth 45 min before operation decrease the probability of developing dry socket after teeth extraction. The explanation of this that metronidazole is effective against an aerobic bacteria which in the main bacteria in dry socket.

V. CONCLUSION

These results highlight (1) the diversity of the microflora associated with pericoronitis and the importance of the anaerobic flora (2) metranidzole plays and important role in pericoronitis management.

REFERENCES


Table 1: Effective Metronidazole activity against bacterial culture isolated from pericoronitis

<table>
<thead>
<tr>
<th>N</th>
<th>Title</th>
<th>Study design</th>
<th>Number</th>
<th>Antibiotics</th>
<th>Clinical finding</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Spread of Odontogenic Infections in Port Harcourt, Nigeria (23)</td>
<td>A prospective study of patients who presented with periodontitis around lower third molar</td>
<td>22</td>
<td>(Metronidazole, 500 mg, every 8 hours) within 5 days to 1 week.</td>
<td>Antibiotics control the infection (infection had not spread to the neck and chest wall)</td>
</tr>
<tr>
<td>2</td>
<td>Metronidazole for the prevention of dry socket after removal of partially impacted mandibular third molar: a randomised controlled trial(25)</td>
<td>Double blind, randomized, placebo controlled, single-center trial. Patient divided to two groups, study group (59 patients) and control (60 patients)</td>
<td>119</td>
<td>Metronidazole 1600 mg (four 400-mg tablets) The patients were given the tablets by mouth 45 min before operation</td>
<td>Patients of the study group developed dry socket after extraction of third molar is 10 which is significantly lower than number of patients developed dry socket from control group (13 patients)</td>
</tr>
<tr>
<td>3</td>
<td>Odontogenic infection: A 1-year retrospective(24)</td>
<td>Retrospective, descriptive study was conducted including all patients with pericoronitis. The data were obtained from the electronic records.</td>
<td>119</td>
<td>Metronidazole</td>
<td>Metronidazole is effective in treatment of pericoronitis.</td>
</tr>
</tbody>
</table>

Table 2: Effective Metronidazole with other antibiotic activity against bacterial culture isolated from pericoronitis

<table>
<thead>
<tr>
<th>N</th>
<th>Title</th>
<th>Study design</th>
<th>Number</th>
<th>Types of bacteria</th>
<th>Culture media</th>
<th>Antibiotics</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Periodontal bacteria in different sampling sites of pericoronitis patients(20)</td>
<td>Bacterial samples were taken aseptically from six sites of each patient. Complain from pericoronits</td>
<td>3</td>
<td>Aggregatibacteractinomycetemocomitans (A.a.), Porphyromonasgingivalis (P.g.), anaerella forsythia (T.f.), and Treponema denticola (T.d.)</td>
<td>All samples were placed immediately into an Eppendorff tube and kept deep-frozen (-70°C) until sent for analyses in carbon dioxide ice.</td>
<td>Metronidazole combined with Roxithromycin or fenoxyethylpenicillin</td>
<td>-Periodontal bacteria T.f. and T.d. were the most common species detected in all the sample sites and in saliva samples. A.a. and P.g. were most commonly detected in saliva and tongue samples</td>
</tr>
<tr>
<td>2</td>
<td>Microbiolog y of mandibular third molar pericoronitis - Incidence of lactamase-producing bacteria(21)</td>
<td>The third molars were evaluated by cultures with nonselective media and with selective media containing antibiotics</td>
<td>26</td>
<td>Obligate anaerobes were present in 21 of the 26 samples. The bacteria most commonly detected were - hemolytic streptococci (26/26) and the genera Prevotella (15/26), Veillonella (15/26), Bacteroides (9/26), and Capnocytophaga (9/26).</td>
<td>Brucella agar containing 5% sheep blood enriched with vitamin K1 (1 mg/L) and hemin (10 mg/L)</td>
<td>Spiramycin metronidazole (1 mg/L, 4 mg/L) metronidazole (4 mg/L)</td>
<td>The means of the ratios (count on selective medium/total anaerobe count) were respectively for metronidazole 0.566 and 0.347 for spiramycin metronidazole.</td>
</tr>
</tbody>
</table>

3 | Evaluation of the Mandibular Third Molar Pericoronitis Flora and Its Susceptibility to Different Antibiotics Prescribed in France(12) | Clinical examination of subject suffering from pericoronitis sampling, microbiological processing with nonselective media, microbial identification. | 35     | Viridans, Actinomyces and Prevotella. | Nonselective media | Spiramycin and metronidazole (MS1, 1 and 4 mg/liter; MS2, 4 and 4 mg/liter) metronidazole (M, 4 mg/liter) | Metronidazole alone or combined with spiramycin was the most effective drug against obligate anaerobes. |
Antibiotic susceptibility of the bacteria causing odontogenic infections (22)

The samples were collected after lesion distal to the third molar exposure using sterile paper tips

Fermentative cocci (Enterococcus faecalis and Streptococcus mutans and oralis). Of the gram-positive cocci, Streptococcus was the microorganism most frequently colonizing

Sheep blood agar plates

Metronidazole

For Gram+ cocci (33.6%) Resistant 66.4% Sensitive
- For Gram-bacilli 85.5% Resistant 14.5% Sensitive
- for Gram + bacilli 100 % Resistant

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