

ORIGINAL ARTICLE

Comparative Analysis of Efficacy of Amoxicillin Plain and Amoxicillin with Clavulanate Acid for Odontogenic Space Infections

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ABSTRACT:

Background: The treatment of odontogenic infections is based on two main elements: surgical treatment and antibiotic therapy. In most cases antibiotic prescription is empirical and relates to a number of factors that are not always well known and defined, and among which are included the perception efficacy, the knowledge of empirical therapy recommendations, opinions regarding the most common etiology, the expected bacterial resistance as well as knowing the existence of different antibiotics. **Aim of study:** To compare the efficacy of amoxicillin plain and amoxicillin with clavulanate acid for odontogenic space infections. **Materials and methods:** The study was conducted in the department of oral surgery of the dental institution. We selected 50 patients with space infections from the outpatient clinic of the department. The patients were randomly divided into two groups, Group A and B with 25 patients in each group. The patients in Group A were prescribed Amoxycillin 500 mg for 7 days and patients in Group 2 were prescribed Amoxycillin and Clavulante acid 625 mg for 7 days. After completion of 7 days patients were recalled to the department and clinical symptoms were assessed. **Results:** Number of male patients was 31 and number of female patients was 19. The mean age of the subjects was 42.23 + 2.1 years ranging from 21 to 65 years. Number of patients with Score 0 was 18 in Group A and 11 in Group B. Number of patients with Score 1 was 5 in Group A and 8 in Group B. Number of patients with Score 2 was 2 in Group A and 4 in Group B. Number of patients with Score 3 was 0 in Group A and 2 in Group B. Number of patients with Score 4 was 0 in both the groups. On comparing the results we observed statistically non-significant results. **Conclusion:** Within the limitations of the present study, we conclude that amoxicillin plain and amoxicillin with clavulanate acid can be prescribed for space infections for positive results.

Keywords: Antibiotics, space infections, tooth extraction.

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INTRODUCTION:

Although the incidence of odontogenic infections has declined in recent years as a result of the improvement in oral health care, it is still the main cause of infectious disease in India and the most common reason for consultation and intervention by dentists.^{1, 2} Odontogenic infections affect the entire population, from children to the elderly. The most frequent are those resulting from dental caries, dentoalveolar infections (infections of the pulp and periapical abscess), gingivitis, periodontitis (including peri-implantitis), aponeurotic space infections, osteitis and osteomyelitis.^{3, 4} The treatment of odontogenic infections is based on two main elements: surgical treatment and antibiotic therapy. In most cases antibiotic prescription is empirical and relates to a number

of factors that are not always well known and defined, and among which are included the perception efficacy, the knowledge of empirical therapy recommendations, opinions regarding the most common etiology, the expected bacterial resistance as well as knowing the existence of different antibiotics.⁵ Other aspect are also relevant, such as the presence of allergies, comorbidity, the prospect of receiving antibiotics, previous experiences and the trust between health professionals and patients.⁶ Hence, the present study was planned to compare the efficacy of amoxicillin plain and amoxicillin with clavulanate acid for odontogenic space infections.

MATERIALS AND METHODS:

The present study was conducted in the department of oral surgery of the dental institution. The ethical clearance for the protocol of study was obtained from ethical committee of the institution. An informed written consent was obtained from the subjects after verbally explaining them the protocol of study. For the study we selected 50 patients with space infections from the outpatient clinic of the department. The patients were randomly divided into two groups, Group A and B with 25 patients in each group. The patients in Group A were prescribed Amoxycillin 500 mg for 7 days and patients in Group 2 were prescribed Amoxycillin and Clavulante acid 625 mg for 7 days. After completion of 7 days patients were recalled to the department and clinical symptoms were assessed. The scoring of pain and inflammation was done on the follow up visit from score 0 to 4. Score 0 represents no inflammation and score 4 represents no improvement in inflammation. The results were tabulated for further management.

The statistical analysis of the data was done using SPSS program for windows. Student’s t-test and Chi-square test were used for statistical significance of the data. A p-value less than 0.05 was predefined as statistically significant.

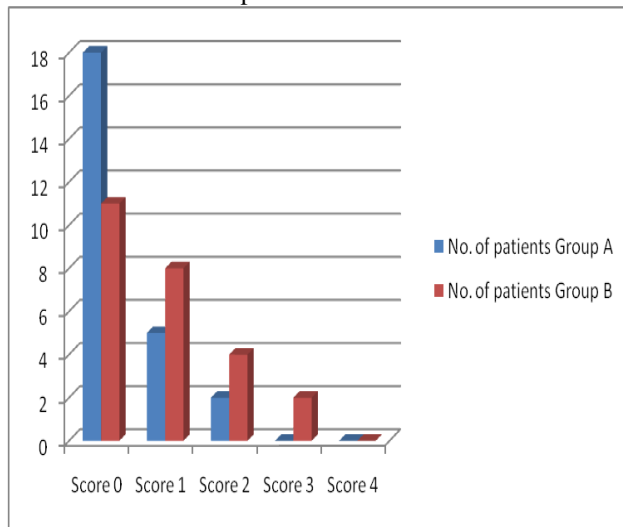
RESULTS:

A total of 50 patients were included in the study. Number of male patients was 31 and number of female patients was 19. The mean age of the subjects was 42.23 + 2.1 years ranging from 21 to 65 years. **Table 1** shows number of patients with different scoring of inflammation for Group A and B. We observed that number of patients with Score 0 was 18 in Group A and 11 in Group B. Number of patients with Score 1 was 5 in Group A and 8 in Group B. Number of patients with Score 2 was 2 in Group A and 4 in Group B. Number of patients with Score 3 was 0 in Group A and 2 in Group B. Number of patients with Score 4 was 0 in both the groups. On comparing the results we observed statistically non-significant results (p<0.05) [Fig 1].

Table 1: Number of patients with different scoring of inflammation for Group A and B

Scoring for inflammation	No. of patients		p-value
	Group A	Group B	
Score 0	18	11	0.62
Score 1	5	8	
Score 2	2	4	
Score 3	0	2	
Score 4	0	0	
Total	25	25	

Figure 1: Number of patients with different scoring of inflammation for Group A and B



DISCUSSION:

The present study was conducted to compare the efficacy of amoxicillin plane 500 mg and amoxicillin with Clavulanate acid 625 mg for space infections. We observed that both the drugs are efficient for resolving space infections but Amoxycillin and CV combination was more efficient for space infection. The results were non-significant. The results were compared to other studies. Segura-Egea JJ et al identified antibiotic prescription practices in the treatment of endodontic infections amongst Spanish oral surgeons. Members of the Spanish Oral Surgery Society (SECIB) were surveyed on antibiotic prescription on six different pulpal and periapical diagnoses. A total of 200 questionnaires were delivered with 127 returned. The average duration of antibiotic therapy was 7.0 +/- 1.0 days. Ninety five percent of respondents selected amoxicillin as the first choice antibiotic in patients with no medical allergies, alone (34%) or associated to clavulanate (61%). The first drug of choice for patients with an allergy to penicillins was clindamycin 300 mg (65%), followed by azithromycin (15%) and metronidazole-spiramycin (13%). For cases of irreversible pulpitis, 86% of respondents prescribed antibiotics. For the scenario of a necrotic pulp, acute apical periodontitis and no swelling, 71% prescribed antibiotics. Almost 60% of respondents prescribed antibiotics for necrotic pulps with chronic apical periodontitis and a sinus tract; in this clinical situation, odontologists prescribed more frequently antibiotics compared to stomatologists. The majority of the members of the SECIB were selecting the appropriate antibiotic for use in endodontic infections, but there are still many who are prescribing antibiotics inappropriately. The use of antibiotics for minor infections, or in some cases in patients without infections, could be a major contributor to the world problem of antimicrobial resistance. Mainjot A et al assessed the types and frequency of antibiotic

prescriptions by Belgian dentists, the indications for antibiotic prescription, and dentists' knowledge about recommended practice in antibiotic use. In this cross-sectional survey, dental practitioners were asked to record information about all antibiotics prescribed to their patients during a 2-week period. The dental practitioners were also asked to complete a self-administered questionnaire regarding demographic data, prescribing practices, and knowledge about antibiotic use. A random sample of 268 Belgian dentists participated in the survey. During the 2-week period, 24 421 patient encounters were recorded; 1033 patients were prescribed an antibiotic (4.2%). The median number of prescriptions per dentist for the 2 weeks was 3. Broad spectrum antibiotics were most commonly prescribed: 82% of all prescriptions were for amoxicillin, amoxicillin-clavulanic acid and clindamycin. Antibiotics were often prescribed in the absence of fever (92.2%) and without any local treatment (54.2%). The most frequent diagnosis for which antibiotics were prescribed was periapical abscess (51.9%). Antibiotics were prescribed to 63.3% of patients with periapical abscess and 4.3% of patients with pulpitis. Patterns of prescriptions were confirmed by the data from the self-reported practice. It was concluded that discrepancies between observed and recommended practice support the need for educational initiatives to promote rational use of antibiotics in dentistry in Belgium.^{7,8}

Konde S et al compared the antibiotic prescription pattern and the awareness of antibiotic resistance among Bachelor of Dental Surgery (BDS) practitioners and pediatric dentists. A hundred BDS practitioners and 100 pediatric dentists included in the study were given a questionnaire containing both open-ended and closed-ended questions. The questionnaire comprised information pertaining to antibiotic prescription for most common oral conditions, commonly prescribed antibiotics, their dosage, etc. The majority of the practitioners prescribed antibiotics for managing oral diseases. On comparing the prescription patterns between the BDS practitioners and pediatric dentists, there was an overprescription in the BDS group for many conditions, which was statistically significant. Amoxicillin was the most commonly prescribed drug in both the groups. In the presence of an anaerobic infection, the most preferred drug was a combination of amoxicillin and clavulanic acid with metronidazole. With regard to the duration of antibiotic prescription, 74% BDS practitioners prescribed antibiotics as a 3-day course and 60% pediatric dentists resorted to a 5-day course, which was statistically significant. The awareness regarding antibiotic prophylaxis and antibiotic resistance was found to be adequate in both the groups. However, there was a general lack of awareness with regard to the guidelines for antibiotic prescribing in both the groups. Authors concluded that practitioners should prescribe antibiotics in accordance with the guidelines to curb antibiotic resistance, an emerging public health problem. Lauber C et al conducted a survey to

determine prescribing practices of general dental and medical practitioners regarding the use of antibiotics for prophylaxis. A questionnaire with an accompanying letter was designed to investigate prescribing practices of general dentists and physicians. The survey encompassed demographic data, mechanisms to keep current with prophylactic practice, first- and second-line drugs prescribed with doses and directions, applicable medical conditions and dental procedures warranting antibiotic prophylaxis. Names were chosen randomly from provincial lists and ethics approval was granted. Responses were compared with 1997 American Heart Association (AHA) guidelines. In all, 1,500 surveys were sent to each group, with a response rate of 32% of dentists and 17% of physicians. There was a significant difference between dentists (95%) and physicians (71%) in selecting the correct first-line antibiotic, amoxicillin, and in choosing the correct dose of amoxicillin (i.e., 2 g, 1 hour before treatment): 88% of dentists and 48% of physicians. Appropriate second-line drugs were correctly selected by 84% of dentists and 67% of physicians--a significant difference with clindamycin chosen most often (82% and 49%, respectively). Over 90% of respondents in both professions correctly identified conditions, such as prosthetic heart valve and endocarditis, requiring antibiotic prophylaxis. They concluded that clinicians are not always aware of current clinical guidelines, and dentists and physicians exhibit different patterns regarding antibiotic prescribing. Dentists are more familiar than physicians with current protocols of the AHA.^{9,10}

CONCLUSION:

Within the limitations of the present study, we conclude that amoxicillin plain and amoxicillin with clavulanate acid can be prescribed for space infections for positive results.

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