

Original Article

Evaluation of efficacy of Amoxicillin plain and Amoxicillin with Clavulanate Acid for treating patients with Odontogenic Space Infections: A Comparative Study

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ABSTRACT:

Background: One of the most common diseases in the oral cavity is Odontogenic infections. With the advent of modern antibiotics, mortality rates have significantly reduced. Such infections are usually self-limiting; purulent material may occasionally burrow deep into fascial spaces. Hence; we planned the present study to assess and compare the effectiveness of amoxicillin plain and amoxicillin with clavulanate acid in treating patients with odontogenic space infections. **Materials and methods:** The present study included evaluation and comparison of effectiveness of amoxicillin plain and amoxicillin with clavulanate acid in treating patients with odontogenic space infections. A total of 64 patients were included in the present study. Random division of all the patients was done into two study groups, with 32 patients in each group, as follows: Group 1- included patients who were given five hundred mg of amoxicillin for seven days, Group 2- included patients who were given six hundred twenty five mg of Amoxicillin plus Clavulanate acid for seven days. On the follow-up visits, we carried out clinical inspection for assessing the pain and inflammation which were graded on a scale of zero to four. Zero score represented absent of inflammation, while four score represented absence of improvement in inflammation. **Results:** In the present study, we analyzed a total of 64 patients with odontogenic space infection and broadly divided them into two study groups; Group 1 and group 2. Non-significant results were obtained while comparing the number of subjects in each group graded on the basis of inflammation. **Conclusion:** Both the antibiotics have equal efficacy in treating patients with positive space infection.

Keywords: Antibiotics, space infections, tooth extraction.

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INTRODUCTION

One of the most common diseases in the oral cavity is Odontogenic infections. With the advent of modern antibiotics, mortality rates have significantly reduced. Such infections are usually self-limiting; purulent material may occasionally burrow deep into fascial spaces. Propagation can be produced by direct continuity, by lymphatic or hematogenous dissemination and depends on the patient's local and systemic factors and on the virulence of the pathogen.^{1,2}

The pyogenic oro-fascial infections are most commonly odontogenic in origin. They may range from periapical abscesses to superficial and deep infections in the neck. If untreated, they generally spread into the contiguous fascial spaces (masseteric, sublingual, submandibular, temporal, buccal, canine and parapharyngeal) and may lead to additional complications. Hence, early recognition

of infections and appropriate therapy is essential.^{3,4} The microbial specificity in odontogenic infections has been more clearly delineated with technologic advances in sampling and anaerobic culturing. Laboratories now routinely culture for anaerobic microorganisms in oxygen-free gas environments, which increases the yield of anaerobic bacteria in culture.⁵ Modern antibiotic therapy has greatly reduced the complications from spread of these infections, but the management of pus in head and neck infection still requires a continuous call for the surgeon's best judgment and skills.⁶⁻⁹

Under the light of above mentioned data, we planned the present study to assess and compare the effectiveness of amoxicillin plain and amoxicillin with clavulanate acid in treating patients with odontogenic space infections.

MATERIALS AND METHODS

We conducted the present study in the department of oral surgery. It included evaluation and comparison of effectiveness of amoxicillin plain and amoxicillin with clavulanate acid in treating patients with odontogenic space infections. For conducting the present study, from the institutional ethical committee, we obtained ethical clearance. We also obtained written consent from all the patients before the starting of the study. A total of 64 patients were included in the present study. Inclusion criteria for the present study included:

- Patients diagnosed with odontogenic space infections,
- Patients with negative history of any known drug allergy,
- Patients with negative history of any other systemic illness
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Random division of all the patients was done into two study groups, with 32 patients in each group, as follows:
 Group 1- included patients who were given five hundred mg of amoxicillin for seven days,
 Group 2- included patients who were given six hundred twenty five mg of Amoxicillin plus Clavulante acid for seven days

Follow-up of the patients was done after one week time for assessment of clinical signs and symptoms. On the follow-up visits, we carried out clinical inspection for assessing the pain and inflammation which were graded on a scale of zero to four. Zero score represented absent of inflammation, while four score represented absence of improvement in inflammation. Experienced oral surgeons analyzed the above results and further send it for statistical assessment. All the results were analyzed by SPSS software and chi-square test was used for assessment of level of significance. P-value of less than 0.05 was taken as significant.

RESULTS

In the present study, we analyzed a total of 64 patients with odontogenic space infection and broadly divided them into two study groups; Group 1 and group 2. Mean age of the patients of the group 1 and group 2 was 32.5 years and 33.1 years respectively. Among group 1 subjects, 20 were males while remaining 12 were females. Among group 2 subjects, 22 were males while the remaining 10 were females. Non-significant results were obtained while comparing the number of subjects in each group graded on the basis of inflammation.

Table 1: Demographic details

Parameter	Group 1	Group 2
Mean age (years)	32.5	33.1
Males	20	22
Females	12	10

Graph 1: Demographic details

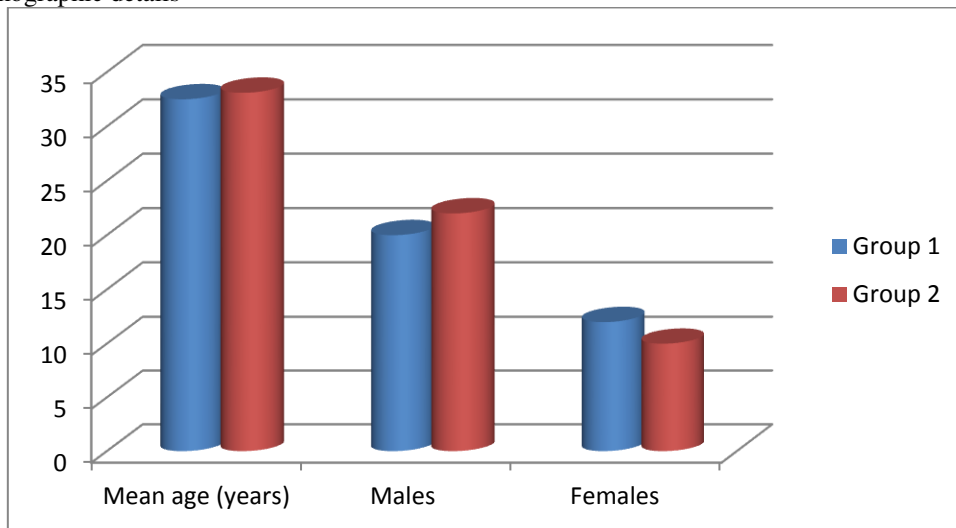
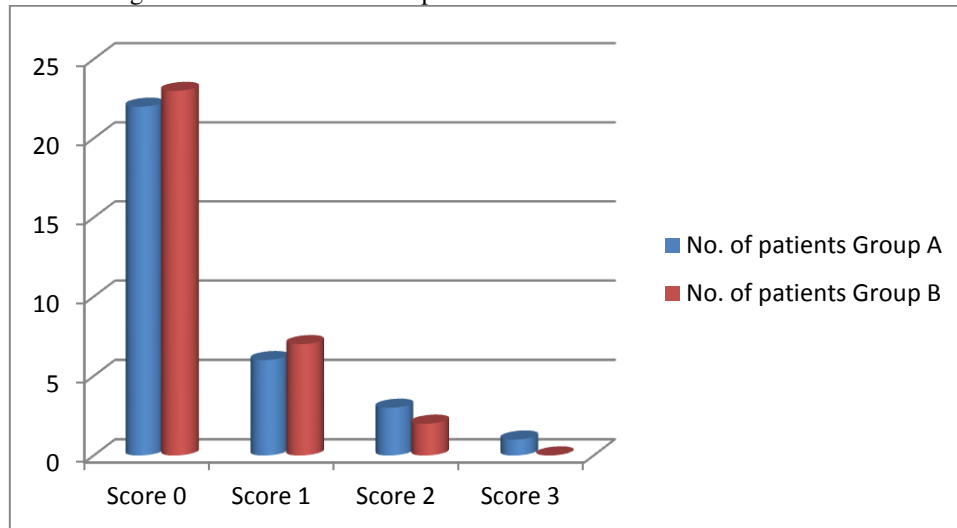


Table 2: Different scoring of inflammation

Scoring for inflammation	No. of patients		p-value
	Group 1	Group 2	
Score 0	22	23	0.98
Score 1	6	7	
Score 2	3	2	
Score 3	1	0	
Score 4	0	0	
Total	32	32	

Graph 2: Different scoring of inflammation for Group 1 and 2



DISCUSSION

In the present study, we analyzed a total of 64 patients with odontogenic space infection and broadly divided them into two study groups; Group 1 and group 2. Non-significant results were obtained while comparing the number of subjects in each group graded on the basis of inflammation. Kamat RD et al compared the odontogenic spaces involved, antibiotic susceptibility of microorganisms, length of hospital stay, and the influence of systemic comorbidities on treatment outcome in diabetic patients. The patients were divided into two groups based on their glycemic levels. The data were compiled and statistically analyzed. A total of 188 patients were included in the study that underwent surgical incision and drainage, removal of infection source, specimen collection for culture-sensitivity, and evaluation of diabetic status. Sixty-one out of 188 patients were found to be diabetic. The submandibular space was the most commonly involved space, and the most prevalent microorganism was *Klebsiella pneumoniae* in diabetics and group D *Streptococcus* in the nondiabetic group. The submandibular space was found to be the most commonly involved space, irrespective of glycemic control. Empiric antibiotic therapy with amoxicillin plus clavulanic acid combined with metronidazole with optimal glycemic control and surgical drainage of infection led to resolution of infection in diabetic as well as nondiabetic patients.¹⁰

Huang TT et al compared the difference in the clinical picture and outcomes between diabetic and nondiabetic patients with deep neck infections. They retrospectively reviewed the records of patients who were diagnosed with deep neck infections and who received treatment at the Department of Otolaryngology of National Taiwan University Hospital between 1997 and 2002. One hundred eighty-five patients were included in our study. Fifty-six patients with diabetes mellitus were enrolled for further analysis (diabetic group) and compared with the other 129 patients without diabetes mellitus (nondiabetic group) in demography, etiology, bacteriology, treatment, duration of hospital stay, complications, and outcome.

The parapharyngeal space was the space most commonly involved in both the diabetic (33.9%) and nondiabetic groups (40.3%). Odontogenic infections and upper airway infections were the 2 leading causes of deep neck infection in diabetic and nondiabetic groups. *Streptococcus viridans* is the most commonly isolated organism in the nondiabetic group (43.7%). However, the most common organism in the diabetic group was *Klebsiella pneumoniae* (56.1%). There were 89.3% of diabetic patients, versus 71.3% of nondiabetic patients, with abscess formation (P = 0.0136). Surgical drainage was performed more frequently in the diabetic group than in the nondiabetic group (86.0% versus 65.2%, P = 0.0142). In comparison with the nondiabetic group, the diabetic group tended to have older mean age (57.2 y versus 46.2 y, P = 0.0007), longer duration of hospital stay (19.7 days versus 10.2 days, P < 0.0001), more frequent complications (33.9% versus 8.5%, P < 0.0001), and more frequent tracheostomy or intubation. Patients with diabetes mellitus are susceptible to deep neck infection. We should pay more attention when dealing with deep neck infections in patients with diabetes mellitus because those patients tend to have complications more frequently and a longer duration of hospital stay.¹¹ Walia S et al assessed the anatomical spaces of head and neck region and causative microorganisms responsible for infections, evaluate the resistance of antibiotics used in treatment and compare the findings with previously reported microbial flora in the orofacial infection. Forty-two patients were recorded. All underwent surgical incision and drainage, received antibiotics cover, and had culture and sensitivity test performed for gram positive and gram negative aerobes. There were 33 male (78.57 %) and 9 female (21.42 %). Out of the 42 patients 28 (66.66 %) presented with single space involvement. The submandibular space was the most frequent location for single space abscess (28.12 %). Fourteen patients presented with multiple space involvement, with a total of 64 spaces being involved. Forty microorganisms were isolated. There were 28 aerobes and 10 anaerobes. Two fungi were also

identified. The most common bacteria isolated were Staphylococcus aureus, Klebsiella, Escherichia coli, Peptostreptococcus. The key issue here, which needs to be remembered, is that antibiotics alone cannot resolve odontogenic infection satisfactorily. Quick recovery of patients results with proper basic management comprising of early drainage/decompression which is equally important.¹²

CONCLUSION

Under the light of above results, the authors concluded that both the antibiotics have equal efficacy in treating patients with positive space infection. However; further research is recommended.

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