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ORIGINAL ARTICLE

Comparative Analysis of Treatment Outcomes of Amoxicillin and Cephedrine in Oral and Dental Infections

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ABSTRACT

Objective: The aim of this study is to compare the outcomes of amoxicillin and cephedrine in oral and dental infections.

Study Design: Observational/ Comparative study

Place and Duration: Riphah International University, Almizan Campus, Rawalpindi/ Nayab Dental Clinic Rawalpindi. January 2021 to Aug 2021.

Methods: Total one hundred and fifty patients of both genders were presented in this study. Demographically detailed of included patients age, sex, cause of infection, residency and education status were calculated after taking informed written consent. Patients had oral and dental infection and did not receive any treatment yet were included. Patients were equally categorized into two groups. Group A had 75 patients and received 500mg amoxicillin while group B had 75 patients treated with 500mg cephredine thrice a day for 5 days. Post-treatment effectiveness among both groups was assessed and compared. SPSS 22.0 version was used to analyze the complete data.

Results: There were 40 (53.3%) males and 35 (46.7%) females in group A while in group B 38 (50.7%) males and 37 (49.3%) females. Mean age in group A was 34.13±12.42 years and in group B mean age was 35.04±11.31 years. 100 (66.7%) cases were from urban area (50 in each group). 88 (58.7%) patients were literate (44 in each group). Gingivitis was found in 33 (44%) cases in group A and 35 (46.7%) in group B while frequency of periodontitis was 37 (56%) in group A and 40 (53.2%) in group B. Smoking was the most common cause of infection followed by compromised oral hygiene and diabetes. Post treatment frequency of effectiveness in group B was higher among 63 (84%) cases as compared to group A. Frequency of adverse outcomes stomach upset, diarrhea and dizziness were lower in group B. Change of dose frequently noted in group A among 15 (20%) cases as compared to group B 8 (10.7%).

Conclusion: We concluded in this study that use of antibiotics in cure of dental and oral infections were effective and useful but amoxicillin was significantly superior to cephredine with less number of adverse outcomes and higher frequency of germs controlled.

Keywords: Dental Infection, Amoxicillin, Cephredine, Gingivitis, Periodontitis

INTRODUCTION

Antibiotics are commonly used by dentists to treat and prevent oral and dental infections. Infections in the mouth, particularly endodontic infections, are often multi-susceptible to multiple pathogens. With analgesics, the great majority of the drugs provided by dentists are antibacterial agents. When it comes to the entire usage of antibiotics in Norway, dentist prescriptions made up 8% in 2007. Antibiotic resistance is a result of the incorrect and excessive use of antibiotics. [1] Dentists prescribe about 10% of all antibiotics in the United States, and this contributes significantly to the problem of antibiotic resistance. [3] Possible side effects and the expense of prescribing are not the only considerations. Because of this, the monitoring of antimicrobial resistance, as well as efforts to modify prescribing attitudes, have become increasingly important. [1] An investigation on the prescribing behaviours of active members of the American Association of Endodontists (AAE) regarding antibiotics found that many were still inappropriately administering the drugs.

Beta-lactamase-producing bacteria are reducing the effectiveness of penicillin and amoxicillin, according to recently published research. Most Gram-negative anaerobes (including Prevotella, Porphyromonas and Bacteroides) are capable of generating beta-lactamase that can cause treatment failure for dental infections [5]. Beta-lactamase producing species have been found in 74% to 88% of patients with periodontitis [6]. Clavulanic acid, a beta-lactamase inhibitor, is added to augmentin (Augmentin) to increase the antibiotic's spectrum of action against bacteria such as Prevotella spp. and Bacteroides spp. anaerobes and Staphylococcus spp. [6]. Studies have shown that amoxicillin/clavulanic acid can effectively treat acute periapical abscesses [6,7].

In addition to being a broad-spectrum antibiotic, clindamycin is also effective against aerobic and anaerobic bacteria, as well as pathogens that produce beta-lactamase. Clindamycin has been shown to be effective in treating odontogenic infections in clinical trials [9-11]. With regard to known cases of pseudomembranous colitis, the use of clindamycin in dental infections requires careful patient selection (a rare but serious consequence of clindamycin). Dental infections have been studied extensively, although there is no published data on the use of twice daily 875/125 mg amoxicillin/clavulanic acid in odontogenic infections. Due to a reduction in the clavulanic acid dose, twice daily dosing with 875/125 mg

amoxicillin/clavulanic acid appears to have a satisfactory clinical outcome, improved patient compliance and reduced stomach distress [12].

Purpose of this study is to compare the outcomes of amoxicillin and cephedrine in oral and dental infections.

MATERIAL AND METHODS

This observational/comparative study was conducted at Riphah International University, Almizan Campus, Rawalpindi/ Nayab Dental Clinic Rawalpindi, during from January 2021 to Aug 2021 and comprised of 150 patients of both genders. Detailed demographics of enrolled patients were recorded after taking informed written consent. Patients had severe medical illness heart disease, carcinoma, uncontrolled heart disease and those did not give any written consent were excluded from this study.

Patients were aged between 15-65 years. Patients had oral and dental infection having risk of bleeding or producing high level of bacteria and did not receive any treatment yet were included. We planned periodontal scalling, periodontal surgery, root canal therapy (RCT) and dental extraction in this study. . Patients were equally categorized into two groups. Group A had 75 patients and received 500mg amoxicillin while group B had 75 patients treated with 500mg cephredine thrice a day for 5 days. At the time of the initial dental examination, the treatment plan included the antibiotic prescribed for infection, as well as the dose and length of treatment. After 5 days, follow-up data on clinical outcomes, including clinical cure, dose modification among patients, and antibiotic change, are collected. In the instance of root canal therapy, patients were followed up for a total of 15 days after the procedure. Any negative effect of the therapy was calculated within two days of the start of the treatment. Post-treatment effectiveness among both groups was assessed and compared. Post treatment pain among patients was compared by using visual analog scale (VAS). Patients satisfaction was also recorded in this study after complete follow up.

Mean standard deviation was used for statistical analysis. Frequencies and percentages were used for categorical variables. Complete data was analyzed by SPSS 22.0 version.

RESULTS

There were 40 (53.3%) males and 35 (46.7%) females in group A while in group B 38 (50.7%) males and 37 (49.3%) females. Mean age in group A was 34.13±12.42 years and in group B mean age was 35.04±11.31 years. 100 (66.7%) cases were from urban area (50 in each group). 88 (58.7%) patients were literate (44 in each group). Gingivitis was found in 33 (44%) cases in group A and 35 (46.7%) in group B while frequency of periodontitis was 37 (56%) in group A and 40 (53.2%) in group B.(table 1)

Smoking was the most common cause of infection found in 38 (50.7%) in group A and 41 (54.7%) in group B followed by compromised oral hygiene 22 (29.3%) in group A and 18 (24%) in group B and diabetes among both groups were 15 (20%) and 16 (21.3%). (table 2)

Post treatment frequency of effectiveness in group B was higher among 63 (84%) cases as compared to group A .(table 3)

Table 1: Baseline details of enrolled cases

Variables	Group A (n=75)	Group B (n=75)
Mean age (years)	34.13±12.42	35.04±11.31
Gender		
Male	40 (53.3%)	38 (50.7%)
Female	35 (46.7%)	37 (49.3%)
Residency		
Urban	50 (66.7%)	50 (66.7%)
Rural	25 (33.3%)	25 (33.3%)
Education Status		
Literate	44 (58.7%)	44 (58.7%)
Illiterate	31 (41.3%)	31 (41.3%)
Types of infection		
gingivitis	33 (44%)	35 (46.7%)
periodontitis	37 (56%)	40 (53.2%)

Table 2: Causes of infection among presented cases

Variables	Group A	Group B
Causes		
Smoking	38 (50.7%)	41 (54.7%)
compromised oral hygiene	22 (29.3%)	18 (24%)
Diabetes	15 (20%)	16 (21.3%)
Total	75 (100)	75 (100)

Table 3: Post treatment frequency of cured patients among both groups

Variables	Group A (n=75)	Group B (n=75)
Cured Patients		
Yes	57 (76%)	63 (84%)
No	18 (24%)	12 (16%)

Change of dose frequently noted in group A among 15 (20%) cases as compared to group B 8 (10.7%). (table 4)

Table 4: Comparison of change of dose between both groups

Variables	Cephedrine	Amoxicillin
Change of dose		
Yes	15 (20%)	8 (10.7%)
No	60 (80%)	67 (89.3%)

At the end of follow up, we found that patients of group B were significantly satisfied because of adverse outcomes stomach upset, diarrhea and dizziness were lower in group B. (table 5)

Table 5: Patients satisfaction and prevalence of adverse outcomes among patients

Variables	Group A (n=75)	Group B (n=75)
Satisfaction		
Yes	56 (74.7%)	61 (81.3%)
No	19 (25.3%)	14 (18.7%)
Adverse Outcomes		
stomach upset	9 (14%)	6 (8%)
diarrhea	6 (8%)	3 (4%)
dizziness	4 (5.3%)	5 (6.7%)

DISCUSSION

An extensive list of surgical procedures and medical conditions that are typically covered by systemic antibiotics is provided below, including impacted third molars, orthognathic surgery, implant surgery, periapical surgery, benign tumour surgery, and patients who are immunocompromised. Patients with symptoms of local

infection and fever should be referred to an endodontic specialist for antibiotic treatment[13]. Following the removal of impacted third molars, evidence suggests that antibiotics are prescribed to help lessen the degree of postoperative pain[14,15]. Abu-Taa et al. conducted a study in which they examined the benefits of pre- and post-operative antibiotics in periodontal surgery patients. It was discovered that the use of post-operative antibiotics resulted in a significant reduction in post-operative discomfort[16]. After third molar surgery, amoxicillin 2000 mg for five days at a reasonable dose and interval helps to cover the treatment requirements[17]. Following the administration of antibiotics after orthognathic surgery, studies have demonstrated a reduction in postoperative infection. Single-dose antibiotic prophylaxis on postoperative infection in patients following orthognathic surgery was studied by Danda et al., and the results showed that it was more effective than single-day antibiotics in preventing infection. A clinically significant difference was found in the documented results[18].

In this observational study one hundred and fifty patients of both genders were presented. Patients were aged between 15-65 years. Patients were equally categorized into two groups. Group A had 75 patients and received 500mg amoxicillin while group B had 75 patients treated with 500mg cephredine thrice a day for 5 days. There were 40 (53.3%) males and 35 (46.7%) females in group A while in group B 38 (50.7%) males and 37 (49.3%) females. Mean age in group A was 34.13±12.42 years and in group B mean age was 35.04±11.31 years. 100 (66.7%) cases were from urban area (50 in each group). 88 (58.7%) patients were literate (44 in each group). These findings were comparable to the previous researches.[19,20] Gingivitis was found in 33 (44%) cases in group A and 35 (46.7%) in group B while frequency of periodontitis was 37 (56%) in group A and 40 (53.2%) in group B.[21]

Smoking was the most common cause of infection found in 38 (50.7%) in group A and 41 (54.7%) in group B followed by compromised oral hygiene 22 (29.3%) in group A and 18 (24%) in group B and diabetes among both groups were 15 (20%) and 16 (21.3%).Previous research presented the same findings in which infection may cause because of smoking and poor brushing.[22] We found that effectiveness in group B (Amoxicillin) was higher among 63 (84%) cases as compared to group A (Cephedrin).[23,24] The broad range of amoxicillin is more than enough for endodontic purposes, and its usage in a healthy person may contribute to the global antibiotic resistance problem. Amoxicillin plus clavulanic acid was the most commonly recommended antibiotic medication in Spain in 2007, followed by amoxicillin alone. In other European nations, amoxicillin is the most commonly prescribed antibiotic in dentistry clinics.[25,26]

In our research change of dose frequently noted in group A among 15 (20%) cases as compared to group B 8 (10.7%). At the end of follow up, we found that patients of group B were significantly satisfied because of adverse outcomes stomach upset, diarrhea and dizziness were lower in group B. In the most recent situation, earlier research found that the rate of prescription antibiotics varied from 87 percent to 99 percent.[27] In cases of endodontic infection, rational antibiotic administration is based on well-defined criteria. As a result, antibiotics should only be used as a supplement to traditional root canal therapy or when immediate treatment is not possible. To avoid antibiotic abuse or overuse, dental practitioners must have a solid awareness of the clinical indications for antibiotic prescribing. [28,29]

We concluded that the use of antibiotics amoxicillin for the treatment of dental and oral infections is more superior to the cephedrine with minimum adverse outcomes and higher number of cured patients.

We conducted this study by using antibiotics individually because there were some limitations in our study one of them was shortage of time that's why combination of other antibiotics (amoxicillin+metronidazole) or with penicillin was not consumed in our research.

CONCLUSION

We concluded in this study that use of antibiotics in cure of dental and oral infections were effective and useful but amoxicillin was significantly superior to cephredine with less number of adverse outcomes and higher frequency of germs controlled. To avoid antibiotic abuse or overuse, dental practitioners must have a solid awareness of the clinical indications for antibiotic prescribing.

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