Journal Homepage: -www.journalijar.com

INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)

Article DOI:10.21474/IJAR01/10310
DOI URL: http://dx.doi.org/10.21474/IJAR01/10310

RESEARCH ARTICLE

EXAMINE PATIENTS WITH CHRONIC PERIODONTITIS IN ORDER TO EVALUATE THE EFFICACY OF NON - SURGICAL THERAPY AND COMBINATION OF AMOXICILLIN AND METRONIDAZOLE COMPARED WITH CEFIXIME

Begum A[1] and Shardar M.S[2]

1. Dr. Asma Begum, Assistant Professor, (Dentistry) Shahid Sheikh Abu Naser Specialized Hospital, Khulna.
2. Mohammad Shahiduzzaman Shardar, Assistant Professor, (Oral and Maxillofacial Surgery), Khulna Medical College, Khulna.

Manuscript Info

Manuscript History
Received: 25 November 2019
Final Accepted: 27 December 2019
Published: January 2020

Abstract

Background: Periodontal diseases are inflammatory reactions that affect the supporting tissues of the teeth, which consist of Gingiva, periodontal ligament, root cementum and alveolar bone. The third generation of cephalosporins – cefixime (CEF), which is an antibiotic with wide spectrum of effect on Gram-positive and Gramnegative bacteria, was used in cases of oral infections.

Objective: The aim of the study to evaluate the efficacy of non-surgical therapy and combination of amoxicillin and metronidazole compared with cefixime.

Methods: The clinical study was conducted at the Department of Periodontology, Clinic for Dentistry of the Khulna Medical College. In order to assess the condition of periodontium, we used the level of gingival inflammation which is expressed through gingival index (GI) according to Loe and Silness, bleeding on probe (BOP), according to Mühlemann and Son, probing depth (PD) and clinical attachment level (CAL).

Results: In control group, mean gingival index, bleeding on probing and probing pocket depth were statistically significantly ($p<0.05$) when compare between day 0 vs day 7. In AMO-MET group, mean gingival index, bleeding on probing and probing pocket depth were statistically significantly ($p<0.05$) when compare between day 0 vs day 7. In cefixime mean gingival index, bleeding on probing and probing pocket depth were statistically significantly ($p<0.05$) when compare between day 0 vs day 7. After seventh day, mean bleeding on probing and probing pocket depth were statistically significantly when compared between control vs AMO-MET and control vs cefixime group.

Conclusion: Mean bleeding on probing and probing pocket depth was statistically significantly when compared between control vs AMO-MET and control vs cefixime group.

Corresponding Author:- Begum A
Address:- Dr. Asma Begum, Assistant Professor, (Dentistry) Shahid Sheikh Abu Naser Specialized Hospital, Khulna.

Introduction:-

Periodontal diseases are inflammatory reactions that affect the supporting tissues of the teeth, which consist of Gingiva, periodontal ligament, root cementum and alveolar bone. In children, the most common form, belonging to the classification of periodontal disease, is plaque-associated gingivitis.[1]

Another researcher defined periodontal diseases as chronic infectious disorders caused primarily by bacteria.[2]

Periodontitis is a severe illness with clinical features manifesting in gingival inflammation, gum recession, formation of periodontal pockets with corresponding pathological content and appearance of subgingival concrements, teeth loosening and pathological teeth migration.[3]

The main etiological cause of periodontitis is bacterial infection. Until the introduction of antibiotics, the therapy was only based on scaling and root planning. Afterwards, a widespread use of antibiotics has begun in dentistry, too. In the meantime the range of used antibiotics has been most commonly reduced to the combination of amoxicillin (AMO), broad spectrum antibiotic, and narrow spectrum metronidazole (MET) acting on anaerobes as the main cocausative agents of the infection.[4]

The third generation of cephalosporins – cefixime (CEF), which is an antibiotic with wide spectrum of effect on Gram-positive and Gramnegative bacteria, was used in cases of oral infections.[5,6]

Amoxicillin significantly improved the outcomes of non-surgical debridement in generalized aggressive periodontitis patients.

Methods:-

The clinical study was conducted at the Department of Periodontology, Clinic for Dentistry of the Khulna Medical College. It involved 179 patients with the progressed form of periodontitis. Criteria for including patients in the study entailed newly, previously untreated and systemic healthy patients, selected on the basis of clinical inspection, whereby a prerequisite was to have at least 23 natural teeth, four of which were first molars and each of the examinees had minimally three teeth in each quadrant, with periodontal pocket depth of 5 mm and larger and also gingival bleeding after periodontal probing. All the participants underwent a clinical examination of the oral cavity as well as periodontal examination. Adequate clinical and anamnestic data were taken for all the participants and also personal data, general medical and dental anamnesis.

All the patients first underwent non-surgical periodontal treatment (day zero) and then they were randomly divided into three equal groups. The first group served as a control, the second one was additionally treated by the combination of AMO and MET, and the third one by CEF.

In order to assess the condition of periodontium, we used the level of gingival inflammation which is expressed through gingival index (GI) according to Loe and Silness,[7] bleeding on probe (BOP), according to Mühlemann and Son,[8] probing depth (PD) and clinical attachment level (CAL). As a part of periodontal examination, we performed measuring on all permanent teeth. Measurement was done by the graduated periodontal probe by the routine method. All listed clinical parameters were noted at the beginning as well as seven days after the treatment.

AMO (500 mg) and MET (400 mg) were given perorally, three times a day and CEF (400 mg) perorally, once a day. Antibiotics were administered over a period of seven days and immediately after the causal treatments of periodontium had been performed. The patients were advised to observe any adverse reaction during the use of antibiotics. All three antibiotics are registered in Serbia in the form of oral use.[6] Statistical analysis was performed by Student's t-test for differences between the groups, with statistically significant results for $p < 0.05$.

Results:-

	Gingival index	Bleeding on probing	Probing pocket depth	Clinical attachment level
Control				
Day 0	1.96±0.44	0.86±0.14	2.29±0.18	3.61±0.92
Day 7	1.41±0.51	0.62±0.29	4.27±0.16	3.39±1.18
P[1]	0.001	0.001	0.001	0.057

AMO-MET				
Day 0	1.80±0.62	0.76±0.24	2.25±0.16	3.59±1.13
Day 7	0.53±0.43	0.19±00.21	2.14±0.15	3.20±1.21
P^1	0.001	0.001	0.001	0.163
P^2	0.001	0.001	0.089	0.182
Cefixime				
Day 0	1.72±0.67	0.82±0.41	4.29±0.13	3.55±0.99
Day 7	0.33±0.30	0.14±0.17	4.27±0.18	3.20±1.12
P^1	0.001	0.001	0.001	0.079
P^2	0.001	0.001	0.063	0.124
P^3	0.022	0.058	0.091	0.235

Table 1:- The influence of the type of treatment on clinical periodontal parameters.

p1 = significance within the groups before and after the treatment; p2 = significance between the antibiotics and control group after treatment; p3 = significance between the antibiotics groups after the treatment; AMO-MET = amoxicillin-metronidazole.

In control group, mean gingival index, bleeding on probing and probing pocket depth were statistically significantly ($p<0.05$) when compare between day 0 vs day 7. In AMO-MET group, mean gingival index, bleeding on probing and probing pocket depth were statistically significantly ($p<0.05$) when compare between day 0 vs day 7. In cefixime mean gingival index, bleeding on probing and probing pocket depth were statistically significantly ($p<0.05$) when compare between day 0 vs day 7.

After seventh day, mean bleeding on probing and probing pocket depth were statistically significantly when compared between control vs AMO-MET and control vs cefixime group.

After seventh day, mean bleeding on probing was statistically significantly when compare AMO-MET vs cefixime group.

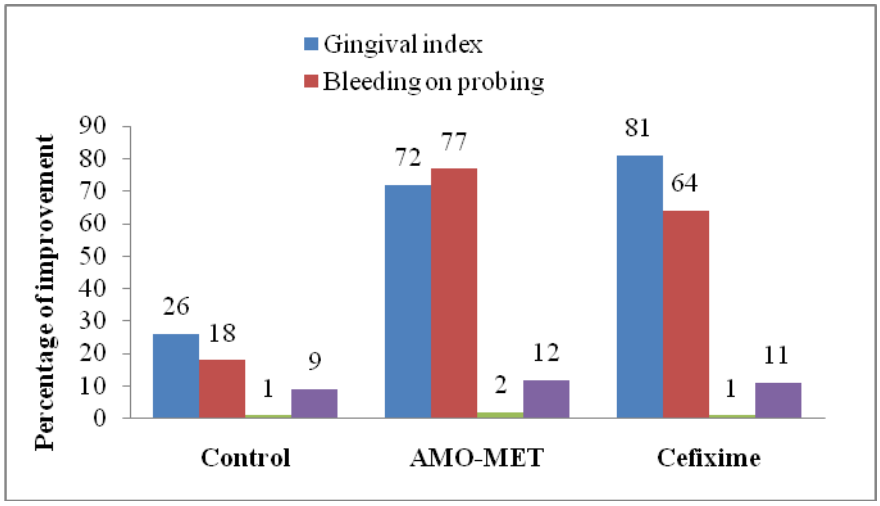

Figure 1:- Bar diagram shows percentage of improvement at end of treatment.

In control group, 26 patients improvements were gingival index followed by 18 were bleeding on probing, 1 was probing pocket depth and 9 were clinical attachment level.

In AMO-MET combination group, 72 patients improvements were gingival index followed by 77 were bleeding on probing, 2 were probing pocket depth and 12 were clinical attachment level.

In cefixime group, 81 patients improvements were gingival index followed by 64 were bleeding on probing, 1 was probing pocket depth and 11 were clinical attachment level.

Discussion:-

In control group, mean gingival index, bleeding on probing and probing pocket depth were statistically significantly ($p<0.05$) when compare between day 0 vs day 7. In AMO-MET group, mean gingival index, bleeding on probing and probing pocket depth were statistically significantly ($p<0.05$) when compare between day 0 vs day 7. In cefixime mean gingival index, bleeding on probing and probing pocket depth were statistically significantly ($p<0.05$) when compare between day 0 vs day 7. After seventh day, mean bleeding on probing and probing pocket depth were statistically significantly when compared between control vs AMO-MET and control vs cefixime group. After seventh day, mean bleeding on probing was statistically significantly when compare AMO-MET vs cefixime group. Dukic et al.[3] reported in accordance with the majority of authors who have also show that, seven days after the beginning of non-surgical therapy, a significant improvement in clinical condition in the values of GI and POB is achieved.[9-11] Furthermore, hitherto clinical experiences also show that the improvement in clinical condition in PD and in CAL, after three, six and twelve months also ensued.[12–16] However, with non-surgical therapy it is impossible to remove all bacteria deposits. For example bacteria from deep unapproachable periodontal pockets or microorganisms from other areas of oral cavity, which are beyond the scope of non-surgical therapy, make results of this therapy to be unpredictable and dependent upon many different factors.[17] At first, antibiotics were administered as monotherapy which was not enough effective due to the existence of mixed aerobic-anaerobic flora 7. For this reason, a dual therapy consisting of AMO-MET was introduced. At the same time, this combination is considered to be the "golden standard" of antibiotic therapy.[13] Guerrero et al.[18] observed at 6 months, statistically significant differences were detected between test and placebo groups in the mean PPD at moderate pockets ($p=0.02$), mean PPD at deep pockets ($p<0.001$) and LCAL at deep pockets ($p<0.05$). Conversely, the percentage of sites with LCAL loss $\geq$2 mm was higher in the placebo group as compared with the test group at 2 months ($p=0.041$) and at 6 months ($p=0.072$). Assem et al.[19] reported both groups with antibiotic therapy had a greater reduction in the percentage of sites with BOP compared to Group C ($p <0.01$).

In control group, 26 patients improvements were gingival index followed by 18 were bleeding on probing, 1 was probing pocket depth and 9 were clinical attachment level. In AMO-MET combination group, 72 patients improvements were gingival index followed by 77 were bleeding on probing, 2 were probing pocket depth and 12 were clinical attachment level. Dukic et al.[3] observed accordance with the findings of other authors,[20-22] as well as meta-analyses. [23,24] However, the mentioned benefit of AMO-MET treatment has to be balanced against their possible adverse reactions.[25]

In cefixime group, 81 patients improvements were gingival index followed by 64 were bleeding on probing, 1 was probing pocket depth and 11 were clinical attachment level. CEF belongs to the third generation of cefalosporins with a broad spectrum of antibacterial activity. So far, it was studied only in vitro in relation to bacterial strains isolated from patients with pyogenic infections of odontogenic origin,[26] but not in patients with periodontitis. CEF significantly improved the clinical condition of GI and in this respect was statistically significantly more effective than the AMO-MET combination. According to the data from Eusterman,[5] CEF is very effective against many oral infections.

Conclusion:-

Amoxicilline plus metronidazole or cefixime in adult patients with periodontal disease significantly increases therapeutic effect of causal therapy in relation to gingival bleeding and bleeding on probing indexes, but not probing depth and clinical attachment level.

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