Azithomycin as an adjunctive to non-surgical treatment in comparison with doxycycline in chronic periodontitis patients: 2-months randomized clinical trial

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ABSTRACT

Background: Antibiotic therapy can be used in very specific periodontal treatment situations such as in refractory cases of periodontal disease which is found to be more prevalent in smokers. The aim of study was to asses the clinical effect of systemic use of Azithromycin and Doxycycline as adjunctive to non surgical scaling and root planning in patients with chronic periodontitis.

Materials and methods: The study participants were 21 adult male, divided to three groups. 1n: GI treated by non surgical root planning with systemic intake of Azithromycin of 500 mg once daily for three days only. In GII Doxycycline 100mg once daily was given for one week in addition to non surgical root planning while in the G III (control group) the patients were treated only by a routine scaling and root planning with out using any type of drug. .The periodontal parameters used are the following:- Plaque index system(PLI) Gingival index (GI),Probing pocket depth (PPD) and Bleeding on probing (BoP)

Results: The study based on three periodontal parameters to asses the results of study, first of which is plaque index and there was a significant low in all groups from the base line until the 4th visit while the bleeding on probing showed a highly significant difference between the groups whom take antibiotics as an adjunctive to a non surgical treatment and the group with out antibiotics. While for probing pocket depth the difference was only between the groups whom take Azithromycin and control group this difference was start in the 2nd visit until the last visit

Conclusion: Although both treatment strategies seemed to be a successful therapy, the adjunctive use of 500 mg azithromycin systemically enhanced the clinical results.

Key words: Azithromycin, Doxycycline. (J Bagh Coll Dentistry 2012;24(1):72-75).

INTRODUCTION

Antibiotic therapy can be used in very specific periodontal treatment situations such as in refractory cases of periodontal disease which is found to be more prevalent in smokers [(1)]. Azithromycin is an antibiotic which is taken up by phagocytes and is released over long periods in inflamed tissue but requires a total of only three doses of 500 mg to produce its therapeutic effect [(2)]. The adjunctive use of azithromycin has the potential to improve periodontal health of young patients with aggressive periodontitis[(1)] The utilization of Azithromycin in combination with non surgical root planning improves the efficacy of non-surgical periodontal therapy in reducing probing depth and improving attachment levels in smokers with moderate to advanced attachment loss[(3)]. Doxycycline (minocycline) is a long acting form of tetracycline. Even though it is taken orally, it has an affinity for dermal structures so it tends to concentrate in the skin, teeth and gingiva. Tetracycline antibiotics which include tetracycline hydrochloride, doxycycline, and minocycline are the primary drugs used. They not only have anti-bacterial actions but also reduce inflammation and help block collagenase. In fact, these two actions seem to contribute most to periodontal protection, rather than their antibacterial properties. Short-term use of standard-dose doxycycline is used for treating acute periodontal infections and for eliminating inflammation. Topical application and long-term use of these antibiotics are showing particular promise [(3, 5)]. The aim of study was to asses the clinical effect of systemic use of Azithromycin and Doxycycline as adjunctive to non surgical scaling and root planning in patients with chronic periodontitis.

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MATERIALS AND METHODS

The participants were 21 adult male non smokers' patients referred to the departments of periodontics in collage of dentistry, Baghdad University who came to receive full mouth periodontal examination and treatment. All patients were diagnosed to have chronic periodontitis. Each patient had to present with at least three periodontal sites in 2 jaw quadrants with a probing pocket depth (PPD)>5mm and of, out of which at least 1 site had to be 7 mm Following a baseline examination, including assessments of plaque index, probing pocket depth (PPD) and bleeding on probing (BoP),

careful instruction for oral hygiene was given. The patients were then randomly assigned to one of three treatment groups each contain 7 patients with 25 teeth per group. 1n: GI treated by non surgical root planning. With systemic intake of Azithromycin of 500 mg once daily for three days in the G II a Doxycycline 100mg once daily was given for one week in addition to non surgical root planning while in the G III (control group) the patients were treated only by a non surgical scaling and root planning with out using any type of drug. In addition, to a base line data the recall visit was every two week to asses the clinical periodontal parameters for two months duration. The periodontal parameters used are the following:-

- Plaque index (Silness and Loe 1964)
- Gingival index (Loe and Silness1963)
- Probing pocket depth (PPD):- is defined as the distance from the gingival margin to the most apical penetration of the periodontal probe inserted in to the gingival crevice. The sites for measurement were mid-buccal line , mid-palatal line, mesio- buccal and disto-buccal line angle no pressure was used the probe was allowed to fall by its own weight.(PPD) were estimated by using William probe.
- Bleeding on probing: - a blunt periodontal probe is inserted to the bottom of the gingival pocket and is moved gently along the tooth (root) surface. The bleeding of this site will demonstrate an active lesion.

The statistical analysis used in this study were a paired t- test between groups and ANOVA f- test were used in each group to investigate the effect of treatment longitudinally with chi square to estimate the percent of cured site .

RESULTS

The descriptive statistics for pocket depth and plaque index in all groups were shown in table (1). While the descriptive statistics for bleeding on probing were shown in table 2. The difference in the mean plaque index in all groups and in different recall visits was non significant by the use of t- test as shown in table 3.

The comparison in the bleeding on probing between groups by the use of chi-square show a non significant difference in the first three visits but was significant in the last visit between G I &GIII and between G II &GIII as shown in table (4). Table5 show the difference in probing pocket depth for all groups a significant difference was found between G I & GII in 2nd, 3rd and 4th visits. Intra groups comparison show a highly significant difference for all periodontal parameters in all groups from the base line visit until the 4th visit as shown in table (6)

Table 1: Descriptive statistics for pocket depth and plaque index in all groups

Groups			Base line(BL)	1st	2nd	3rd	4th
G I	PD	Mean	5,28	3,84	3,4	3,22	3,2
		SD	0,890	0,786	0,595	0,678	0,692
	PLI	Mean	2,1	0,604	0,42	0,368	0,328
		SD	0,313	0,188	0,125	0,143	0,14
GII	PD	Mean	5,28	4,08	3,88	3,92	3,92
		SD	1,061	0,953	0,927	0,909	0,812
	PLI	Mean	1,76	0,528	0,464	0,416	0,42
		SD	0,681	0,113	0,07	0,068	0,040
G III	PD	Mean	5,24	4,04	3,84	3,6	3,56
		SD	1,011	1,135	1,027	1	0,96
	PLI	Mean	2,472	0,636	0,456	0,428	0,424
		SD	0,217	0,099	0,126	0,097	0,072

Table 2: Descriptive statistics for bleeding on probing in all groups

		BL	1st	2nd	3rd	4th
G I	0	55	74	84	91	94
	1	45	26	16	9	6
G II	0	69	76	85	90	91
	1	32	23	15	10	9
G III	0	60	69	77	85	86
	1	40	31	23	15	14

Table 3: t-test between groups for plaque index

		G1&G11		G1&G111		G11&G111	
		t-test	P-value	t-test	P-value	t-test	P-value
PLI	BL	0.699	0.963	0.073	0.149	0.117	0.767
	1st	0.794	0.435	0.433	0.368	3.26	0.856
	2nd	0.975	0.339	1.745	0.094	0.245	0.808
	3rd	0.038	0.51	1.515	0.143	0.421	0.677
	4th	0.588	0.892	0.82	0.235	0.204	0.84

Table 4: chi- square for bleeding on probing in all groups.

	G1&G11		G1&G111		G11&G111	
	Chi-test	P-value	Chi-test	P-value	Chi-test	P-value
BL	3.771	0. 49 NS	0.512	0.474 NS	1.512	0.219 NS
1st	0.205	0.65 NS	0.613	0.434 NS	1.518	0.218 NS
2nd	0.038	0.845 NS	1.561	0.212 NS	2.079	0. 49 NS
3rd	0.058	0.809 NS	1.705	0.192 NS	1.143	0.285 NS
4th	0.649	0.421	3.556	0.048 S	1.228	0.08 S

***P<0.05 Significant**
****P>0.05 Non significant**

Table 5: t-test for probing pocket depth for all groups

		G I & GII		GI&GIII		GII&GIII	
		t-test	P-value	t-test	P-value	t-test	P-value
PPD	BL	0.157	0.877	0.000	1.000	0.135	0.894
	1st	0.743	0.465	0.876	0.390	0.120	0.906
	2nd	1.858	0.076	2.087	0.048 * S	0.140	0.890
	3rd	1.629	0.116	2.746	0.011 * S	1.053	0.303
	4th	1.572	0.128	2.958	0.007 * S	1.226	0.232

Table 6: ANOVA test (PLI, BoP, PPD) for all groups

	PLI		BoP		PPD	
	F-test	P-value	F-test	P-value	F-test	P-value
G I	35.20	P<0.01 HS	37.4	P<0.01 HS	11.3	P<0.01 HS
G II	11.23	P<0.01 HS	11.29	P<0.01 HS	22.40	P<0.01 HS
G III	10.26	P<0.01 HS	87.28	P<0.01 HS	10.81	P<0.01 HS

***P<0.01 High significant**

DISCUSSION

The concentrations of azithromycin in plasma, saliva, normal gingiva, and pathological tissues reached the highest values 12 hours after the last dose and then declined gradually. Consistent levels of the drug in normal gingiva and pathological tissues could be detected, however, up to 6.5 days, indicating that azithromycin was retained in target tissues for a long time after the end of treatment[5]. Moreover, azithromycin levels in both normal gingiva and pathological tissues exceeded the minimum inhibitory concentrations of most pathogens involved in the pathophysiology of chronic inflammatory periodontal diseases. Notably, The concentrations of azithromycin in plasma, saliva, normal gingiva, and pathological tissues reached the highest values 12 hours after the last dose (0.37+/-0.05 mg/l, 2.12+/-0.30 mg/l, 6.30+/-0.68 mg/kg, and 11.60+/-1.50 mg/kg, respectively) and then declined gradually[8]. The study based on three periodontal parameters to asses the results of

study first of which is plaque index and there was a significant low in all groups from the base line until the 4th visit this is due to the need for optimum oral health for the starting of a non surgical scaling and root planning and concluded that the adjunctive antibiotics may help in controlling plaque formation on tooth surfaces as shown by the t-test while in the second periodontal parameters which is the bleeding on probing there was a highly significant difference between the groups whom take antibiotics as an adjunctive to a non surgical treatment and the group with out antibiotics. while for probing pocket depth the difference was only between the groups whom take Azithromycin and control group this difference was start in the 2nd visit until the last visit this was in agreement with Pradeep et al 2008 in which they show the adjunctive use of 0.5% azithromycin as a controlled drug-delivery system enhanced the clinical and microbiologic results as shown by the inter group comparison [6]. also Mascarenhas etal in 2005 showed that the utilization of azithromycin in combination with non surgical root planning improves the efficacy of non-surgical periodontal therapy in reducing probing depth and improving attachment levels in smokers with moderate to advanced attachment loss[5]. The t-test between the Doxycycline group and control group was non significant this was disagree with Wennstrom et al in 2002 who found that simplified sub gingival instrumentation combined with local application of doxycycline in deep periodontal sites can be considered as a justified approach for non-surgical treatment of chronic periodontitis[7]. The observed clinical effect of additional doxycycline is rather limited and could be a placebo effect. Further, as well as calculating means of and mean amounts of pockets, a multilevel analysis might have provided stronger evidence for an additional effect of doxycycline while controlling for other influencing factors.also Doxycycline may need longer time of administration i.e the study periods was 10-15 days could reveal a different reacting of this drug.

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