



Outcome of Azithromycin with Non-Surgical Periodontitis Therapy at Dental Hospital, University of Health Sciences, Lao PDR

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Objective: The study aimed to evaluate the effectiveness of Azithromycin as an adjunct to non-surgical periodontal therapy.

Methods: This is a cross-sectional descriptive study. The subjects were divided into two equal groups (Group study and Group control). At baseline, patients received a full-mouth supra scaling with an ultrasonic scaler, scaling, and root planing in sites with probing depths >4 mm, and were placed on a systemic antibiotic regimen: Azithromycin 250 mg (Group study) and doxycycline 250 mg (Group control), all groups once a day for 5 days. The subjects were recalled at day 5, day 30, and day 90.

Results: The comparison of the outcome of periodontitis treatment with Azithromycin 250 mg and doxycycline 250 mg, evaluated by plaque index and clinical attachment loss, showed significant differences between the groups. The clinical parameters were different from the baseline values.

Conclusion: Azithromycin 250 mg with non-surgical periodontitis therapy was significant.

Keywords: Azithromycin 250 mg with non-surgical periodontitis therapy; Lao PDR.

1. INTRODUCTION

Periodontitis is an infectious disease that affects the periodontal tissues such as the periodontal ligament, cementum, and alveolar bone [1].

Periodontitis is a type of periodontal disease characterized by rapid loss of alveolar bone support [2]. Even though its prevalence is low, it still poses a significant problem in dentistry due to the complex etiology, treatment, and prognosis of this disease [3]. It has a complex etiology involving both clinical and microbiological factors in periodontal destruction [4,5]. The subgingival microflora is one of the most important factors contributing to periodontal destruction [6]. The oxidative killing mechanisms of PMNs are not completely effective under anaerobic conditions. Therefore, antimicrobial agents such as azithromycin, doxycycline, ciprofloxacin, metronidazole, and synthetic penicillin like amoxicillin are used to control these periodontal infections [7,8,9]. These antibiotics are chosen for their activity against anaerobic flora, availability in higher concentrations in gingival crevicular fluid, long duration in the tissues, and anticollagenolytic properties [10,11]. In addition to the administration of azithromycin in the treatment of periodontal infections, it is also effective in inhibiting gram-negative facultative anaerobes [12]. Studies have shown that antimicrobial strategies for the treatment of periodontitis have had a good response, with azithromycin being used in therapy for periodontitis [13]. Rao, Deepika Pawar Chandrashekhara, et al. (2023) studied the treatment of periodontitis with azithromycin and doxycycline and found that doxycycline was more effective than azithromycin [14]. Povšič,

Katja, et al. (2021) studied the treatment of periodontitis with doxycycline and azithromycin and found that all the groups showed significant improvement [15]. Kerdmanee, Kunchorn (2023) studied the treatment of periodontitis with doxycycline and azithromycin and found that doxycycline was more effective than azithromycin [16]. A report from the Faculty of Dentistry in Laos in 2023 studied the treatment of periodontitis with doxycycline and azithromycin and found that doxycycline was more effective than azithromycin [17,18,19].

2. METHODOLOGY

The present study was a Cross sectional Interventional study at the Dental Hospital, Faculty of Dentistry, University of Health Sciences, Lao PDR, conducted from August 2023 to February 2024. The inclusion criteria were individuals aged between 16 to 30 years at the time of first diagnosis with periodontitis, systemically healthy, not taking any medication for the last 6 months, and not having undergone periodontal therapy in the previous 12 months. Participants had to be willing to participate in the study. Exclusion criteria included the presence of systemic diseases, drug allergies, long-term anti-inflammatory therapy, partially erupted or impacted teeth, and unwillingness to give consent for the study.

The patients were Convenience sampling and divided into two groups: the study group and the control group. In the study group, patients received a full-mouth supra debridement with an ultrasonic scaler, scaling and root planing in pockets deeper than 4mm, and were prescribed azithromycin 250 mg - 1 tablet a day for 5 days.

In the control group, patients underwent the same initial treatment but were prescribed doxycycline 250 mg - 1 tablet a day for 5 days. All groups also received Ibuprofen 400 mg for 1 tablet every 8 hours for 5 days and were recalled at the 5th, 30th, and 90th days for periodontal examinations.

The findings were recorded using the data collection form, including Plaque Index (Silness and Loe, 1964), Gingival Margin, Probing Pocket Depth (PPD), and Clinical Attachment Loss (CAL).

The mean values of Plaque Index (PI) and Clinical Attachment Level (CAL) were calculated and compared using the Paired T Test. Spearman's Test was performed for statistical analysis at a 95% confidence interval (95% CI).

3. RESULTS

Comparison of PI values between groups.

In the group study (n=10), the baseline mean plaque index was 2.2. After scaling, root planning, and antibiotic therapy with azithromycin 250 mg once a day for 5 days, the PI score at day 5 follow-up was 1.04. The mean plaque index at day 30 follow-up was 0.56, and at day 90 follow-up, it was 0.19 (as shown in Table 1).

In the group control (n=10), the baseline mean plaque index was 2.34. After scaling, root planning, and antibiotic therapy with doxycycline 250 mg once a day for 5 days, the plaque index at day 5 follow-up was 0.97, at day 30 follow-up was 0.45, and at day 90 follow-up was 0.23.

Both groups showed significant differences between each other and from baseline values (P<0.05) (as shown in Table 1).

Comparison of CAL values between the study group and the control group:

The study group (n=10) had a baseline mean clinical attachment loss of 3.87 mm. After scaling, root planning, and antibiotic therapy with azithromycin 250 mg once a day for 5 days, the mean clinical attachment loss at day 90 was 2.68 mm (as shown in Table 2).

The control group (n=10) had a baseline mean clinical attachment loss of 4.26 mm. After scaling, root planning, and antibiotic therapy with doxycycline 250 mg once a day for 5 days, the mean clinical attachment loss at day 90 was 2.56 mm (as shown in Table 2).

Both groups showed a significant difference between groups and a significant improvement from baseline values (P<0.05).

Table 1. Comparison of PI value between study group and control group

The patient (N = 20)	Follow up of PI clinical parameter								P value
	Baseline		Day 10		Day 30		Day 90		
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	
Group I (n=10)	2.2	0.16	1.04*	0.27	0.56*	0.28	0.19*	0.11	0.02**
Group II (n=10)	2.34	0.44	0.97*	0.24	0.45*	0.10	0.23*	0.09	0.04**
P value	0.56		0.002**		< 0.001**		< 0.001**		

T Test * Significant difference between groups (P<0.05)
Paired Test ** significantly different from baseline values (P<0.05)

Table 2. Comparison of CAL value between study group and control group

The patient (N = 20)	Follow up of CAL clinical parameter				P value
	Baseline		Day 90		
	Mean	SD	Mean	SD	
Group I (n=10)	3.87	1.23	2.68*	0.30	0.01**
Group II (n=10)	4.26	1.49	2.56*	1.07	0.01**
P value	0.15		< 0.001**		

T Test * Significant difference between groups (P<0.05)
Paired Test ** significantly different from baseline values (P<0.05)

4. DISCUSSION

All patients received detailed oral hygiene instructions during the 90-day follow-up. Treated patients demonstrated a pattern of decrease in their PI scores throughout the study period compared to baseline PI and CAL values. Furthermore, patients treated with azithromycin showed a significant decrease in PI scores compared to those treated with doxycycline at days 5, 30, and 90. This decrease in PI scores can be attributed to the improved oral hygiene practices of the patients. These findings are consistent with a study by Povšič, Katja, et al., 2021 [15], which did not report any changes in PI scores. The variation in results may be due to differences in the study population, including socioeconomic status, education level, and oral hygiene awareness.

Regarding CAL values, both azithromycin and doxycycline treated patients showed a decrease in their CAL values throughout the study period compared to baseline values. Patients treated with azithromycin had significantly lower CAL values compared to those treated with doxycycline at days 5 and 90. This decrease in CAL values in both groups can be attributed to the administration of antibiotics in addition to scaling and root planning. These results differ from a study by Kerdmanee, Kunchorn, 2023 [16], and a report by the Faculty of Dentistry, Laos, 2023 [17] because the subjects in this study were specifically selected, between the ages of 16 and 30, in good general health, not on any medications during the preceding six months, and not receiving periodontal therapy in the previous twelve months.

5. CONCLUSION

The study found a positive effect of non-surgical treatment for periodontitis with azithromycin 250 mg, improving clinical parameters such as clinical attachment level at day 90.

6. LIMITATION

A limitation of this study was that it did not include the socioeconomic status of the participating subjects. Additionally, there was no comparison with an 'only SRP' group and systemic antibiotic use.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models

(ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of manuscripts.

ETHICAL APPROVAL

As per international standards or university standards written ethical approval has been collected and preserved by the author(s).

CONSENT

As per international standards or university standards, patient(s) written consent has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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