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Evaluation the Efficacy of Topically Applied Ciprofloxacin Gel in Treatment of Periodontitis Patients (Clinical, Radiographic and Microbiological Study)

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ABSTRACT

Aim: to assess the topical use of ciprofloxacin gel's microbiological, clinical, and radiographic efficacy in patients with stage I or II, grade A periodontitis as an adjuvant treatment. **Subjects and methods:** The mean age of the 14 patients was 39±6.55, and they tested positive for Aa. They also had grade A periodontitis, stage I or II. Two patient groups were identified: Patients in Group I received non-surgical periodontal therapy together with an intrapocket application of ciprofloxacin gel, and patients in Group II received non-surgical periodontal therapy exclusively**. Results:** After one and three months, a statistically significant difference (p-value <0.05) was seen between the baseline. Furthermore, there were statistically significant variations in the gingival index between the two groups at various time intervals from the baseline, as well as a statistically significant variation in the probing depth measurement in each group at various time intervals from the baseline. The clinical attachment level measurements of the two groups were compared at different intervals. There were statistically significant differences between the clinical attachment level measurements of the two groups when compared at different intervals to the baseline. There was no statistically significant difference in the radiographic marginal bone level between the two groups at one, three, or six months from the baseline. **Conclusion:** Compared to scaling and root planning alone, adjunctive use of ciprofloxacin in-situ gel 1% proved to have a positive impact on both clinical and microbiological parameters of Aa copy number in patients with stage I and II grade A periodontitis.

KEYWORDS

Scaling, ciprofloxacin, periodontitis, intrapocket application

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INTRODUCTION

Certain periodontal bacteria interacting with the host can generate a multifactorial infectious ailment known as periodontitis. The gradual and permanent deterioration of the periodontal supporting tissue is its defining feature. The high correlation between Aa and Pg and periodontal pathology makes them two of the most important periodontal pathogens. Periodontal pathogens are the principal agents

in charge of the infection process. The goal of periodontitis treatment is to stop the degradation of the teeth's periodontal support by getting rid of any possibly harmful bacteria from the inflammatory pocket [1]. Scaling and root planning, or SRP, has a long history of proven effectiveness. Systemic or local antibiotics may be used to improve treatment results while also mitigating the low efficacy of traditional therapy. [2]

The most often used antibiotics for treating periodontitis as an adjuvant include metronidazole, clindamycin, azithromycin, ciprofloxacin, doxycycline or minocycline, metronidazole and ciprofloxacin, and metronidazole and amoxicillin. [3] A wide range of aerobic gram-positive and gram-negative bacteria are combated by the broad-spectrum antibacterial fluoroquinolone (FQ) family of medications. Ciprofloxacin represents the second generation of FQ. It is efficacious against gram-negative bacteria and many periodontal diseases. It does not suppress species of streptococcus, which are related to periodontal health. [4]

The benefit of systemic antibiotic therapy is that it can be administered simply and easily to various periodontal sites as well as extra dental oral locations that may host periodontal bacteria. However, systemic antimicrobial therapy has drawbacks such as unpredictable patient compliance, medication incapacity to reach sufficient concentration at the infection site, heightened risk of adverse drug reactions, possibility of multiple antibiotic-resistant organism selection, and proliferation of opportunistic pathogens**.** [5]

PATIENTS AND METHODS

Fifty-five individuals of both sexes participated in this randomized controlled clinical, radiological, and microbiological trial. Eleven female and three male patients, ranging in age from 27 to 55, tested positive for Aa. Their mean age was 39±6.55, and they were clinically diagnosed with stage I to stage II, grade A periodontitis. All of the study participants had clinical examinations performed on them.

Two patient groups were identified:

Group I: Patients received intrapocket administration of ciprofloxacin gel in addition to non-surgical periodontal care (supra- and subgingival cleaning and root planing).

Group II: Patients received root planing and supra- and subgingival scaling as the only non-surgical periodontal therapy.

Inclusion criteria:

1. In accordance with the clinical criteria of the American Academy of Periodontology, patients with stage I to stage II, grade A periodontitis were diagnosed. [6]
2. The Cornell Medical Index, with its modification, indicated that none of the patients had any additional systemic disorders. [7]
3. Every patient should cooperate, follow directions for proper dental hygiene, and comply well.
4. Availability for program maintenance and follow-up.

Exclusion criteria:

1. Women who are nursing or pregnant.
2. People who smoke.
3. For at least six months, the patients underwent scaling and root planing, nonsteroidal anti-inflammatory medicine, and antibiotic treatment.

Samples:

1. Sample collection and storage

All base line samples were taken by the same standardized protocol for Sampling procedure. Before sampling, selected sites and the adjacent teeth were isolated with cotton rolls, supragingival plaque was carefully removed with a sterile scaler to prevent the contamination of the samples with saliva or supragingival plaque. [8]

Paper point ISO #40 taper 0.02 mm/mm® [1] was inserted slowly with a sterile dental tweezer into the pocket until tissue resistance felt or the paper points bent **Fig (1)**. [9]

The paper point was left for 20 sec, then it was carefully removed without touching the adjacent unrelated tissues and then transferred to a sterile Eppendorf tube containing a phosphate buffer saline (PBS) and frozen at-80˚C until further microbiological analysis. Extracted samples were sent to microbiological laboratory.

2. Detection of Aa by real time PCR

OG1555'CATTCTCGGCGAAAAAACTA3', OG1565'CCCATAACCAAGCCACATAC-3. Using the previous sequence as a primer for PCR.

Steps for P CR

DNA extraction: -

The SinaPure DNA purification kit®[10] was used for DNA extraction.

DNA extraction steps:

1. After vortexing the samples as quickly as possible, the paper points were taken out.
2. After three minutes of centrifuging the samples at 10,000 rpm, the supernatant was disposed of.
3. To create a homogenous suspension, 400µL of lysis solution and 20 µL of proteinase K solution were added to the samples and thoroughly mixed by pipetting or vortexing.
4. The samples were incubated for ten minutes at 56°C.
5. After adding 200 µL of ethano (96–100%), the mixture was pipetted or vortexed.
6. After transferring the produced lysate to a purification column that was placed within a collecting tube, the tube was centrifuged for one minute at 8000 rpm.
7. The purification columns were then put into a fresh 2 mL collection tube after the collection tubes with the flow-through solution were disposed of.
8. After adding 500µL of wash buffer I (containing ethanol) to the samples, they were centrifuged at 10,000 for one minute. After that, the purification columns were reinserted into the collecting tube and the flow-through was disposed of.
9. The samples were mixed with 500 µL of wash buffer II (containing ethanol) and centrifuged at 10,000 for three minutes. Subsequently, the purification columns were moved into a sterile 1.5mL micro centrifuge tube and the flow-through was disposed of.
10. To elute genomic DNA, 50 µL of elution buffer was added to the purification column membrane's core. Samples were then centrifuged for two minutes at 10,000 rpm after being incubated for two minutes at room temperature.
11. The pure DNA was stored at -20˚C for further use, and the purification columns were disposed of.

a. Amplification:

PCR were performed using the T100 thermal cycler®[11] the amplification reactions were performed at a defined volume of 20µl.each reaction mixture consisted of:

Distilled water	6 µ l
PCR Master mix	10 µ l
Primer (OG155)	1µ l for Aa
Primer (OG156)	1µ l for Aa
Template DNA	2 µ l

The following procedures were used to carry out the amplification program: a preliminary denaturation stage at 95˚C for 5 minutes, then 35 cycles of primer annealing at 50˚C for 1 minute, primer extension at 72˚C for 40 seconds, and final extension at 72˚C for 5 minutes.

Periodontal treatment:

All patients underwent extensive scaling and root planing at baseline, which was done with the aid of hand devices such as scalars, Gracey curettes (Hu-Friedy® [12], and an ultrasonic device (MiniPiezon)®[5].

b) Getting the items ready for usage.

- Making a 1% ciprofloxacin gel:
- 9.08 grams of potassium dihydrogen phosphate were dissolved in enough distilled water to form one liter of buffer solution. ApH of 7.2 was achieved.
- Gels were created by continuously swirling the polymer at various concentrations in water for two hours. After dissolving the ciprofloxacin powder in propylene glycol, the mixture was gradually added to the polymer dispersion mentioned above while being constantly stirred. A uniform gel was generated by gradually stirring the mixture.
- Wide-mouthed bottles were used to store the produced gels. The gels were placed in a vacuum oven for two hours in order to release any trapped air bubbles.

Post treatment instructions:

Patients were instructed not to eat, drink, or rinse for at least 30 min, not to disturb the area with tongue, finger or toothpick, not to chew any hard, or sticky food for at least 1 week, postpone brushing and flossing on the treated site for 1week.

Recall maintenance visits:

Patients were brought for microbiological assessments at 1-, 4-, and 12-weeks post-treatment, and for clinical and radiographic evaluations at 3 and 6 months.

Microbiological evaluation (quantitative assessment)

Using primers (OG155, OG156) for Aa, real-time PCR (qPCR) was used to evaluate Aa's microbiological status at baseline, one, and three months. SYBR Green PCR Master mix®[14] and the 7500 Fast RT PCR System)® [15] were used to conduct real-time PCR.

Procedure:

A volume of 20µl was used for the reaction. 10µl of SYBR Green Master mix, 0.5 µl of each primer, 2 µl template DNA, and 7 µl distilled water made up each reaction mixture. The following procedures were used to carry out the amplification program: a first denaturation step at 95˚C for 2min; 40 cycles of primer annealing at 50˚C for 30 sec; primer extension at 72˚C for 40 sec (at this point, fluorescence was noticed). A standard curve was created and the starting copy number of the unknown samples was determined by relating the cycle threshold (Ct) values.

Periodontal evaluation

Patients were evaluated clinically at baseline 3, 6 months post operatively using the following periodontal parameters: (A) - Plaque Index (PI) (B)–Gingival Index (GI) (C) - Probing Depth (PD) (D) - Clinical Attachment Level (CAL) Probing depth and attachment level were measured using William's graduated periodontal probe®[16].

Radiographic evaluation:

Every patient had their marginal bone level (MBL) measured at baseline, one, three-, and six-months following therapy. Using an˚Cclusal template and a photostimulable phosphor plate (PSP) size 2 image sensor®, digital periapical radiographs were produced via the paralleling approach. In order to ensure reproducibility and enable serial radiographic comparison, a customized acrylic block[17] and ZT-Dental®[18] x-ray sensor holder were utilized to get the right direction,

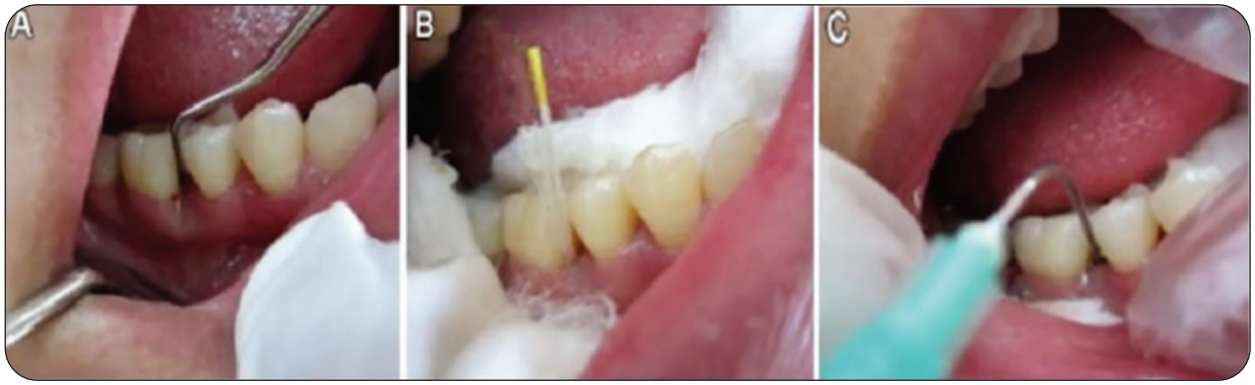

Fig. (1) Clinical photograph showing female 35 aged stages Igrade A periodontitis (A) sample collection (B) clinical examination (C) intra-pocket ciprofloxacin gel application.

proper positioning, and alignment of the image plate sensor and x-ray cone. Exposures took place for 0.2 seconds at 70 KVp and 7 mA. The personalized bite blocks were kept in airtight plastic bags and used again for later radiography exams (Fig. 1).

Using Image J software®[19] linear measurements were performed on the digitalized pictures. The distance between the cementoenamel junction and the alveolar crest was the marginal bone level. By subtracting or adding MBL of a specific period to the initial MBL at baseline, one can determine the gain or loss of MBL. Two inter-examiners examined the loss of alveolar bone, respectively. After two intra-examiner measurements from each examiner, the average value was determined and noted. [20]

RESULTS

Detection of *Aa* by qPCR:

Aggregatibacter actinomycetemcomitans was identified by PCR in (25%) patients of the total participants in this study.

The mean and standard deviation of Aa values in group l were (25.27±1.61) at baseline, but decreased to (8.34±0.53 and 14.40±0.92) after 1 and 3 months, respectively. In group II, baseline Aa readings were (27.45±1.31), but after 1 and 3 months, they decreased to (13.18±0.63 and 16.74±0.80, respectively) **(Table 1)**.

In Group I, there was a statistically significant change between baseline, one and three months ($p<0.05$). **Table 1**. In Group II, there was a statistically significant difference between baseline, one, and three months ($p<0.05$). **Table 1**.

Relation between groups:

There were no statistically significant differences between group I and group II at baseline ($p=0.08$). however, there was a statistically significant differences between 2 groups at 1 and 3 months where ($p=0.00$) **Table 1**.

Results of clinical evaluation for Aa:

The clinical evaluations of periodontal status for all patients including plaque index, gingival index, Probing pocket depth and clinical attachment level for Aa

A) Change in plaque index score:

The mean and standard deviation of plaque index score in group I was (1.80±0.30) at baseline that reduced to (1.17±0.43, 1.28±0.43 and 1.35±0.41) after 1, 3, and 6 month respectively. While in group II, the mean and standard deviations was (1.37±0.06) at baseline that reduced to (1.34±0.31, 1.26±0.45 and 1.54±0. 30) after 1, 3, and 6 months respectively **Table 2**.

In group I, there was a statistically significant difference between baseline, 1, 3 and 6 months where (p<0.05). A statistically significant difference was found between 3 and 6 months where (p<0.0) **Table 2**.

In group II, there was a statistically significant difference between baseline, 1, 3 and 6 months where (p<0.05). A statistically significant difference was found between 3 and 6 months where (p<0.05) **Table 2**.

Relation between groups:

There were no statistically significant differences between group I and group II at different intervals (p=0.50,0.44,0.94,0.38) respectively **Table 2**.

B)- Changes in gingival Index (GI):

The mean of gingival index score in group 1 was (1.75±0.23) at baseline that reduced to (1.29±0.11, 0.57±0.13 and 0.39±0.09) after 1, 3, and 6 month respectively. While in group 2 the mean of gingival index score was (1.72±0.36) at baseline that reduced to (1.29±0.27, 0.69±0.16, 0.57±0.29) after 1, 3, and 6 month respectively **Table 3**.

Between the baseline, 1, 3, and 6 months, there was a statistically significant change in group II (p<0.05) Moreover, a statistically significant difference was found between 3 and 6 months where (p<0.05) **Table 3**.

In group II there was a statistically significant difference between baseline, 1, 3 and 6 months where (p<0.05). And a statistically significant difference was found between 3 and 6 months where (p<0.05) **Table 3**.

Relation between groups:

There were no statistically significant differences between group I and group II at baseline (p=0.83). There were no statistically significant differences between group I and group II at 1, 3 and 6 months where (p=1.00, 0.09, 0.09) respectively **Table 3**.

C)-Probing Pocket Depth measurements (PPD):

The mean of probing pocket depth measurements in group 1 was (3.50±0.30) at baseline that reduced to (2.79±0.30, 2.08±0.77 and 1.93±0.02) after 1, 3, and 6 month respectively. While in group 2 the mean of probing pocket depth measurements was (3.5±0.27) at baseline that reduced to (2.74±0.28, 2.26±0.34 and 1.80±0.22) after 1, 3 and 6 months of the treatment respectively **Table 4**.

In Group I, there was a statistically significant difference between baseline, 1, 3 and 6 months where (p<0.05). Another significant difference was found between 3 and 6 months where (p<0.05) **Table 4**.

In group II there was a statistically significant difference between baseline, 1, 3 and 6 months where (p<0.05) and a statistically significant difference was found between 3 and 6 months where (p<0.05) **Table 4**.

Relation between groups:

There were no statistically significant differences between group I and group II at baseline (p=0.96). There were no statistically significant differences between group I and group II at 1, 3 and 6 months where (p=0.71, 0.19, 0.10) respectively **Table 4**.

D) Clinical Attachment Level measurements (CAL)

The mean of clinical attachment level measurements in group 1 was (1.50±0.29) at baseline that reduced to (0.96±0.23, 0.64±0.22 and 0.49±0.19) after 1, 3 and 6 months of the treatment respectively. While in group 2 the mean of clinical attachment level measurements was (1.76±0.49) at baseline that reduced to (1.00±0.20, 0.48±0.17 and 0.37±0.10) after 1, 3 and 6 months of the treatment respectively **Table 5**.

In Group I, there was a statistically significant difference between baseline, 1, 3 and 6 months where (p<0.05). furthermore, a statistically significant difference was found between 3 and 6 months where (p<0.05) **Table 5**.

In group II, there was a statistically significant difference between baseline, 1, 3 and 6 months where ($p<0.05$). A statistically significant difference was found between 3 and 6 months where ($p<0.05$) **Table 5**.

Relation between groups

There were no statistically significant differences between group I and group II at baseline ($p=0.18$). while, there were statistically significant differences between group I and group II at 1, 3 and 6 months where ($p=0.69, 0.10, 0.11$) respectively **Table 5.**

Radiographic evaluation of marginal bone level for Aa:

The mean of radiographic marginal bone level measurements in group I was (3.14±0.43) at baseline that decrease in 1 month (3.13±0.39) then increased to (3.21±0.16) and (3.25±0.23) after 3 and 6 months of the treatment respectively. While in group II the mean of radiographic marginal bone level was (3.04±0.28) at baseline decrease in 1 month (3.03±0.45) then increased to (3.11±0.33) and (3.19±0.10) after 3 and 6 months of the treatment respectively **Table 6.**

In group I, there was no statistically significant difference of radiographic marginal bone level at 1,3and 6 months compared to baseline p-value was (0.76,0. 58,0.55) respectively **Table 6**.

In group 2, there was no statistically significant difference of radiographic marginal bone level at 1,3 and 6 compared to baseline p-value was (0.91,0.30,0.15) respectively.

There was no statistically significant difference between the two groups at different evaluation periods (p-value <0.05) **Table 6**.

Table (1) *Changes in bacterial copy number for Aa positive group*

Variable	Group I				Group II				*p*- value
	Mean	SD	Min	Max	Mean	SD	Min	Max	
Baseline	25.27	1.61	22.27	27.51	27.45	1.31	25.04	28.89	**0.08ns**
After 1m	8.34	0.53	7.35	9.08	13.18	0.63	12.02	13.87	**0**
After 3m	14.4	0.92	12.69	15.68	16.74	0.8	15.27	17.63	**0**
p-value	**<0.05**				**<0.05**				

Table (2) *Showing the minimum, maximum, mean ± standard deviation (SD) and P- values of PI score for both Aa positive groups.*

Variables	Group I				Group II				*p*-value
	Mean	SD	Min	Max	Mean	SD	Min	Max	
Baseline	1.80	0.30	1.39	2.43	1.87	0.06	1.75	1.95	**0.50ns**
After 1m	1.17	0.43	0.59	1.85	1.34	0.31	0.88	1.67	**0.44ns**
After 3m	1.28	0.43	0.83	1.87	1.26	0.45	0.57	1.75	**0.94ns**
After 6m	1.35	0.41	0.70	1.90	1.54	0.30	1.12	1.90	**0.38ns**
p-value	**=0.038,0.020,0.036**				**=0.004,0.021,0.042**				

Table (3) *Showing the minimum, maximum, mean ± SD and P-values of GI score for both Aa positive groups.*

Variables	Group I				Group II				*p*- value
	Mean	SD	Min	Max	Mean	SD	Min	Max	
Baseline	1.75	0.23	1.25	2.00	1.72	0.36	1.25	2.25	**0.83ns**
After 1m	1.29	0.11	1.00	1.50	1.29	0.27	0.75	1.75	**1 ns**
After 3m	0.57	0.13	0.25	0.75	0.69	0.16	0.50	1.00	**0.09ns**
After 6m	0.39	0.09	0.25	0.50	0.57	0.29	0.25	1.00	**0.09ns**
p-value	**<0.05**				**<0.05**				

Table (4) *Showing the minimum, maximum, mean ± SD and P-values of PPD in (mm) for both Aa positive groups.*

Variables	Group I				Group II				*p*- value
	Mean	SD	Min	Max	Mean	SD	Min	Max	
Baseline	3.5	0.30	3.00	4.00	3.5	0.27	2.75	3.71	**0.96ns**
After 1m	2.79	0.30	2.25	3.50	2.74	0.28	2.25	3.25	**0.71ns**
After 3m	2.08	0.77	1.75	2.50	2.26	0.34	1.75	3.00	**0.19ns**
After 6m	1.93	0.02	1.75	2.00	1.8	0.22	1.60	2.4	**0.10ns**
p-value	**<0.05**				**<0.05**				

Table (5) *Showing the minimum, maximum, mean ± SD and P-values of CAL in (mm) for both Aa positive groups.*

Variables	Group I				Group II				*p*- value
	Mean	SD	Min	Max	Mean	SD	Min	Max	
Baseline	1.50	0.29	1.00	2.25	1.76	0.49	0.75	2.50	**0.18ns**
After 1m	0,96	0.23	1.50	1.50	1.00	0.20	0.50	1.25	**0.69ns**
After 3m	0.64	0.22	1.20	1.20	0.48	0.17	0.25	0.80	**0.10ns**
After 6m	0.49	0.19	1.00	1.00	0.37	0.10	0.20	0.53	**0.11ns**
p-value	**<0.05**				**<0.05**				

Table (6) *Showing the minimum, maximum, mean ± SD and P-values of MBL in (mm) for both Aa positive groups.*

Variables	Group I				Group II				p-value
	Mean	SD	Min	Max	Mean	SD	Min	Max	
Baseline	3.14	0.43	2.50	3.50	3.04	0.28	2.50	3.30	**0.31ns**
After 1m	3.13	0.39	2.50	3.50	3.03	0.45	2.50	3.50	**0.36ns**
After 3m	3.21	0.16	2.80	3.30	3.11	0.33	2.60	3.40	**0.42ns**
After 6m	3.25	0.23	2.90	3.40	3.19	0.10	2.90	3.30	**0.48ns**
p-value	**>0.05** ns				**>0.05** ns				

DISCUSSION

Periodontitis is a complex infectious condition caused by a combination of specific periodontal bacteria and the host's own actions that leads to the progressive and irreversible destruction of periodontal supporting tissue. One of the main reasons Aa and pg are regarded as highly relevant periodontal pathogens is their significant association with periodontal pathology. In the infectious process, periodontal microorganisms are the main cause. They are a part of the red complex, which is considered to be the most significant species linked to periodontitis. Gram-positive and gram-negative aerobic bacteria are all targeted by the broad-spectrum antibacterial fluoroquinolone (FQ) class of medications. Ciprofloxacin is the second-generation FQ.

It is efficient against certain gram-negative bacteria and periodontal diseases. It does not suppress the streptococcus species that are associated with periodontal health. Promoting a microbiome that is associated with periodontal health. As of right now, only this drug works against all strains of Aa [(4)] in the age range examined in this investigation. The age range of the patients in this study was 27 to 55, with a mean age of 39 ± 6.55. The 2017 revised categorization system criteria led to the diagnosis of stage I to stage II, grade A periodontitis. The suggested course of treatment was to adopt a nonsurgical method. [(21)] It was also mentioned that periodontitis usually affects adults. [(22)]

The results of an earlier study showing that the detection frequency of Aa was 42%/36% were corroborated by about 25% of the Aa positive samples in the current analysis.[(23)] Periodontal therapy goals for treating periodontitis are always to lower PPD, maintain or raise CAL, and greatly reduce clinical symptoms of gingival inflammation. These metrics are utilized to identify treatment efficiency measures that seek to accomplish the clinical benefits of ciprofloxacin by hydrochloride gel as an adjuvant in the ongoing experiment. In addition, these values are noted at baseline and following therapy. [(24)]

The results of the study demonstrated that, after three and six months, there was a statistically significant decline in the plaque index and gingival index scores in both groups, with group I having a larger decrease than group II. This is in keeping with studies that shown a drop in these parameters when ciprofloxacin and SRP were combined as opposed to SRP being used alone, relative to the baseline value.[(25)]. This study discovered that following a 6-month follow-up, there was a decrease in the mean probing pocket depth and clinical attachment level in both groups. In comparison to the baseline in both groups, the reduction was likewise highly statistically significant at various intervals.

This coincides with the results of a recent investigation that evaluated the efficacy of subgingival ciprofloxacin administration locally and found that ciprofloxacin was used in conjunction with scaling and root planing to reduce pocket depth and clinical attachment gain overall[(26)]. Microbiologically speaking, the study's findings showed that, in comparison to the baseline, there was a decrease in the overall Aa count and a delay in pocket recolonization in both groups; furthermore, the decrease was statistically significant at one month and continued at three months. In the ciprofloxacin group, the percentage reduction value of Aa was 67% and 41% after one month, respectively, and 52% and 41%, respectively, for the SRP group of Aa (after 1 month 52% and after 3months 39%).

The results of the investigation showed that, after decreasing in the original group, the Aa bacterial copy number increased in the control group. A different study that discovered that dental hygiene practices can induce bacteria to settle in the periodontal pocket quickly suggests that this finding could be explained by the quick recolonization of germs. [(27)] Prior studies have shown that periodontal surfaces exposed to ciprofloxacin may prevent the maturation of an Aa biofilm during the regeneration phase that follows conventional therapy, while allowing commensal biofilm creation to continue unhindered. Furthermore, ciprofloxacin-resistant Aa strains are rare. [(28)]

The current investigation discovered no increase in MBL in either group at any given period based on radiographic aspects. At baseline, one, three, and six months, there was no discernible difference between the ciprofloxacin and control groups in both Aa groups. This finding is consistent with another study that found nonsurgical periodontal therapy did not alter the radiographic appearance of the bone level at places where there was horizontal bone loss. Additionally, a related study reported these results[29].

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تقييم فعالية جل السيبروفلوكساسين المطبق موضعياً في علاج مرضى التهاب اللثة (الدراسة السريرية والشعاعية والميكروبيولوجية)

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الملخص :

الهدف: تقييم الاستخدام الموضعي للفعالية الميكروبيولوجية والسريرية والشعاعية لجيل سيبروفلوكساسين في المرضى الذين يعانون من المرحلة الأولى أو الثانية من التهاب اللثة من الدرجة الأولى كعلاج مساعد..

المواد والطريقة: كان متوسط عمر المرضى الأربعة عشر 39 ± 6.55، وكانت نتيجة اختبارهم إيجابية لـ AA. وكان لديهم أيضًا التهاب اللثة من الدرجة الأولى، المرحلة الأولى أو الثانية. تم تحديد مجموعتين من المرضى: تلقى المرضى في المجموعة الأولى علاجًا غير جراحي للثة مع تطبيق جل سيبروفلوكساسين داخل الجيوب. وتلقى المرضى في المجموعة الثانية علاجًا غير جراحي للثة بشكل حصري.

النتائج: بعد شهر وثلاثة أشهر، شوهد فرق ذو دلالة إحصائية (قيمة P <0.05) بين خط الأساس. علاوة على ذلك، كانت هناك اختلافات ذات دلالة إحصائية في مؤشر اللثة بين المجموعتين على فترات زمنية مختلفة من خط الأساس، بالإضافة إلى تباين ذو دلالة إحصائية في قياس عمق الفحص في كل مجموعة على فترات زمنية مختلفة من خط الأساس. وتمت مقارنة قياسات مستوى الارتباط السريري للمجموعتين على فترات مختلفة. كانت هناك فروق ذات دلالة إحصائية بين قياسات مستوى الارتباط السريري للمجموعتين عند مقارنتها على فترات مختلفة بخط الأساس. لم يكن هناك فروق ذات دلالة إحصائية في مستوى العظام الهامشية الشعاعية بين المجموعتين في شهر أو ثلاثة أو ستة أشهر من خط الأساس.

الخلاصة: بالمقارنة مع التحجيم وتخطيط الجذر وحده، أثبت الاستخدام المساعد للسيبروفلوكساسين في الموقع هلام 1٪ أن له تأثير إيجابي على كل من المعلمات السريرية والميكروبيولوجية لعدد نسخة AA في المرضى الذين يعانون من التهاب اللثة من الدرجة الأولى والثانية من الدرجة A.

الكلمات المفتاحية: الكحت، سيبروفلوكساسين، التهاب اللثة، تطبيق داخل الجيب