

# Non-Surgical Periodontal Therapy Decreases Periodontal Pocket Depth and Clinical Attachment Loss of Rheumatoid Arthritis Patients

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## ABSTRACT

**Objective:** The objective of the present study was to determine the effect of non-surgical periodontal therapy on the disease severity in rheumatoid arthritis patients.

**Methods:** Five hundred and twenty arthritis patients were included in the study, using consecutive non-probability sampling from the outpatient department of various public and private hospitals of Pakistan. Patients with periodontitis along with systemic Rheumatoid Arthritis (RA) were included in the study. Clinical parameters taken for the severity of periodontitis were the Gingival recession (GV), Periodontal Pocket Depth (PPD) and Clinical Attachment Loss (CAL). Independent sample t-test was used for significance before and after non-surgical periodontal therapy. Data was presented with mean (standard deviation).

**Results:** The PPD and CAL of Rheumatoid Arthritis patients were found to be decreased significantly following non-surgical periodontal treatment (p value < 0.05), unlike the gingival recession, which did not decrease significantly (p value > 0.05).

**Conclusion:** The PPD and CAL values of periodontal patients with rheumatoid arthritis were significantly reduced after giving non-surgical Periotherapy along with oral hygiene instruction.

**Keywords:** arthritis; gingiva; periodontitis; periodontal pocket

## INTRODUCTION

Rheumatoid arthritis is common chronic inflammatory disorder of unknown etiology, it involves 1-2% of the population and mainly comprises joints. Rheumatoid arthritis (RA) targets any age group. Incidence of RA is more common at 50 to 75 years of age, RA frequency in females above 55 is up to 5 percent because of increase ratio of affected females [1]. The annual incidence of RA has been reported to be around 40 per 100,000 [2].

Arthritis may be symmetrical, but if it became uncontrolled, it might cause joints destruction, mainly involve bone and cartilage, and ends in bone deformity. Rheumatoid arthritis is a systemic disorder that involves extra-articular manifestations in other body systems like ocular, pulmonary, vascular, oral, and other organs or systems [3]. RA is considered a collection of inflammatory infiltrates within the synovial membrane [4]. Rheumatoid arthritis has been recently known with increased frequency [5].

RA is idiopathic, but there can be other known causes mainly involvement of microorganisms. In Periodontitis microorganism involved in subgingival dental plaque, enter subgingival epithelium, causes inflammatory reaction and finally result in periodontitis [6]. This Periodontium tissue damage leads to gingival recession, periodontal attachment loss, and increase gingival sulcus depth [7].

Several studies report the association of RA and Periodontitis. Several researchers demonstrated its relationship with disease severity [8-10]. Porphyromonas gingivalis are common pathogenic microorganism that contains the enzyme peptidyl arginine deiminase, that in a genetically predisposed individual, the presence of such peptides may contribute to breaking to endogenous citrullinated antigens, causes anti-citrullinated peptide/protein antibodies (ACPA) production and develop Rheumatoid Arthritis. In a pilot study by Mobini and his team, it was found that there was moderate to severe periodontitis in Rheumatoid Arthritis patients [11]. Similarly, study done in Africa found a significant association between RA and PD [12].

## MATERIAL AND METHODS

A Cross sectional comparative study was conducted in various public and private medical hospitals of Pakistan. Non-probability convenience sampling was done. The research was conducted in accordance with the declaration of Helsinki guidelines and ethical review board committee gave the ethical approval. After taking informed consent from all study participants, total 520 diagnosed RA patients coming to dental OPD were enrolled in the present

study from outpatient departments. The duration of study was one year. Periodontitis was defined as clinical involvement of at least 10 teeth in patients with at least 20 teeth present.

**Data Collection:** Basic demographic data along with detailed history and examination was recorded using a pretested questionnaire. Complete dental checkup was performed by the researchers themselves including Gingival Recession, Periodontal Pocket Depth and Clinical Attachment Loss on their first visit. Each patient was treated non surgically with scaling root planning and oral hygiene instructions. Three visits, two weeks apart were arranged for patients. After two visits of non-surgical treatment, GV, CAL and PPD were measured again at the third visit.

The values were recorded for statistical analysis by SPSS version 23. Data was transferred in Microsoft excel sheet and later transferred to SPSS version 23. Independent sample t-test was performed to access the value of GV, CAL & PPD before and after scaling in Rheumatoid Arthritis Patients. P value of less than 0.05 was considered significant.

## RESULTS

A total of 182 male and 338 female patients of rheumatoid arthritis participated in the study. Mean age of patients was 43. Values of GV, CAL and PPD are given in table 1.

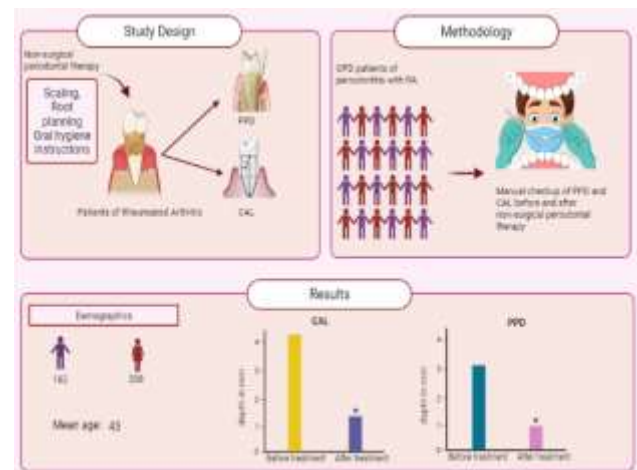


Figure 1: Study Design, Methodology and Results

Table 1: Value of Cal &amp; PPD before and after scaling in Rheumatoid Arthritis Patient

No. of patients N=520	Before non-surgical treatment mm (Mean $\pm$ S.D)	After non-surgical treatment mm (Mean $\pm$ S.D)	p- value
Gingival recession	4.86 $\pm$ 1.74	3.69 $\pm$ 0.83	0.12
Periodontal pocket depth	3 $\pm$ 1	1 $\pm$ 2	0.018 *
Clinical attachment loss	4.3 $\pm$ 2.8	1.8 $\pm$ 0.9	0.021 *

p value = < 0.05 \*

The p-value for RA factor lesser than < 0.05 for both CAL and PPD which makes result statistically significant (Figure 1). This showed that by the help of non-surgical periodontal therapy the disease severity of Rheumatoid Arthritis, affecting periodontitis can be reduced.

## DISCUSSION

Rheumatoid Arthritis is a syndrome that involves multiple system of the body and shows different symptoms ranging from small joint involvement to multiple system involvement. PD is Inflammatory disorders of hard and soft tissues around teeth that causes destruction by bacteria particularly gram-negative facultative anaerobe existing on tooth surfaces [13]. Researchers have been reported that there is association of diabetes, myocardial infarction and stroke with Periodontitis, which showed high risk of chronic diseases [14-16].

Few many studies reported the association between Rheumatoid Arthritis and Periodontitis [17, 18]. These quantitative studies showed conflicting results [19]. Kiran et,al concluded that bleeding on probing mean values were significantly different in RA patients before nonsurgical periodontal therapy and after non-surgical periodontal therapy [20]. Clinical attachment loss was also found statistically higher in patents with periodontitis. Similarly PPD was higher in patients with periodontitis [21]. In 2013 a relationship between PD and RA has been conducted. Both of these are chronic disorders that can cause immunologic, environmental, and genetic disturbances and leads to damage of bones and tissues surrounds teeth [22].

According to literature non-surgical periodontal therapy can improve the periodontal parameters clinically, which showed improvement in clinical symptoms of Rheumatoid Arthritis [23]. In present study non-surgical periodontal therapy was done in two sittings in 24 hours. All enrolled participants were given oral oral hygiene instructions in every sitting.

In our study, CAL  $\geq$  4 mm and probing depths  $\geq$  5 mm, and improvement in PPD and CAL parameters achieved not only with non-surgical periodontal therapy but also the oral hygiene instructions given during all visits. On the other hand, some studies reported that even under proper instructions, some patients in severe RA, hand movements are not proper and patients couldn't follow the proper brushing, that showed no such improvement in RA and PPD parameters [24-26].

**Conclusion:** It has been concluded that in present study periodontal therapy along with oral hygiene instructions in patients with RA and PPD showed improvement in disease severity clinically, after been evaluated with clinical periodontal.

**Data Availability:** All data generated and analyzed in this study are included within the article or available from the corresponding author on reasonable request.

**Ethical approval:** This study was approved by the Ethical Review Committee of Azra Naheed Dental College, Lahore, Pakistan (ERB/IRB/No. 5081/ANDC).

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**Conflict of interest:** Authors have none to declare

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