RESEARCH PAPER

Link between Rheumatoid Arthritis and Periodontal Disease in Indian Population: A Clinical Study

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ABSTRACT

Rheumatoid Arthritis (RA) and Periodontal Disease (PD) share several similarities in their epidemiology and immunopathogenesis. Both are chronic inflammatory conditions characterized by tissue destruction mediated by an aberrant immune response. This clinical study was undertaken to explore the possible association between RA and PD by evaluating periodontal parameters in patients with rheumatoid arthritis compared to systemically healthy controls with chronic periodontitis.

Keywords: Rheumatoid arthritis, Periodontal Disease

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INTRODUCTION

Rheumatoid arthritis (RA) is a chronic autoimmune disorder characterized by persistent synovial inflammation, joint destruction, and systemic complications. Periodontal disease (PD), a chronic inflammatory condition of the supporting tissues of teeth, is similarly driven by an exaggerated host immune response to bacterial biofilms.[1,2,3]

Recent literature has suggested an association between RA and PD due to their shared

inflammatory pathways, including elevated cytokines such as tumour necrosis factor-α (TNF-α), interleukin-1β (IL-1β), and C-reactive protein (CRP).[4,5,6] Moreover, both conditions have been linked to genetic susceptibility factors such as HLA-DR alleles and to common risk factors like smoking and advancing age.[7]

This study was designed to clinically evaluate and compare periodontal status in RA patients and healthy controls, thereby assessing the potential interrelationship between these two chronic diseases.

MATERIALS AND METHODS

This cross-sectional clinical study was conducted on 200 subjects:

- **Test group (n=100):** Patients diagnosed with rheumatoid arthritis.
- **Control group (n=100):** Systemically healthy individuals with chronic periodontitis.

Inclusion criteria:

- Confirmed diagnosis of RA (test group).
- Presence of chronic periodontitis (both groups).
- Age between 30–60 years.

Clinical evaluation:

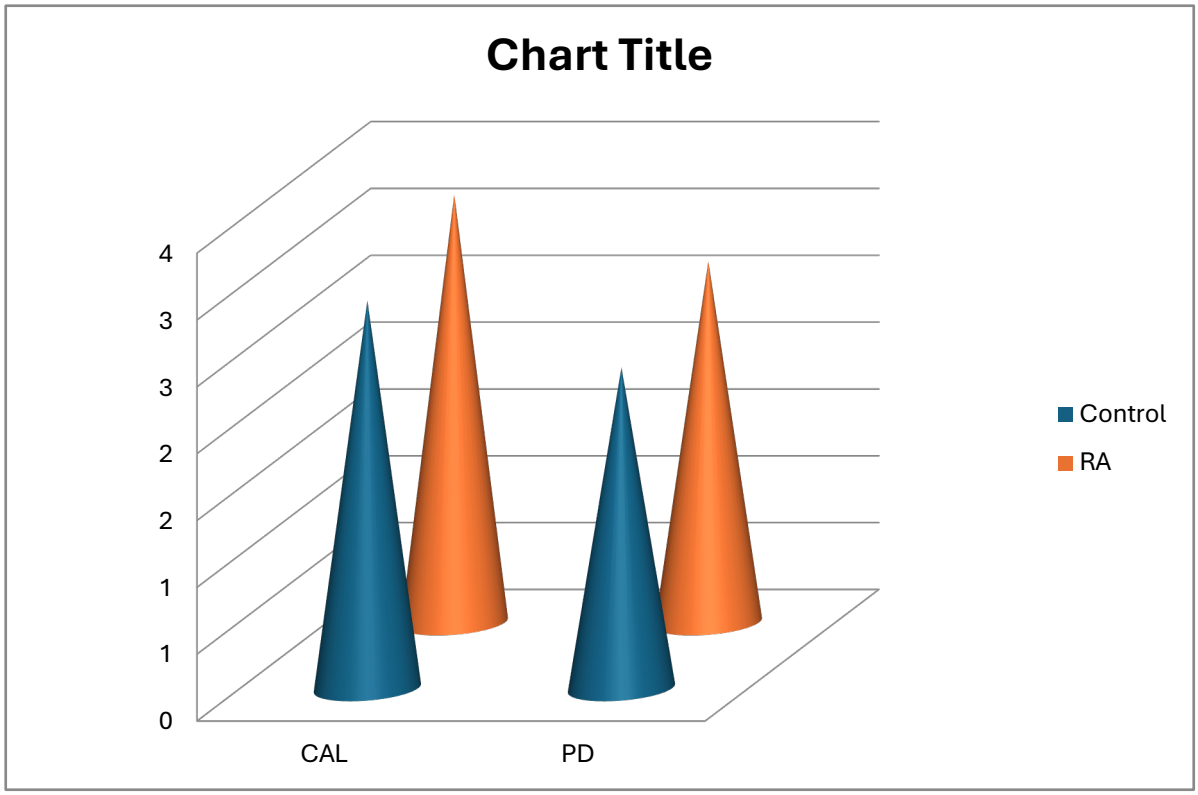
- **Rheumatologic assessment**:
  - Tender joint count,
  - swollen joint count,
  - RA factor, and
  - CRP levels.
- **Periodontal assessment**:
  - Gingival Bleeding Index (GBI),
  - Plaque Index (PI),
  - Probing Pocket Depth (PPD), and
  - Clinical Attachment Level (CAL).

Statistical analysis:

- Mean values,
- chi-square tests, and

p-values were calculated to determine the significance of observed differences.

RESULTS



CAL

Mean Value - 3.2mm ± 1.0 (RA)

Mean Value- 3.0mm ± 0.8 (control)

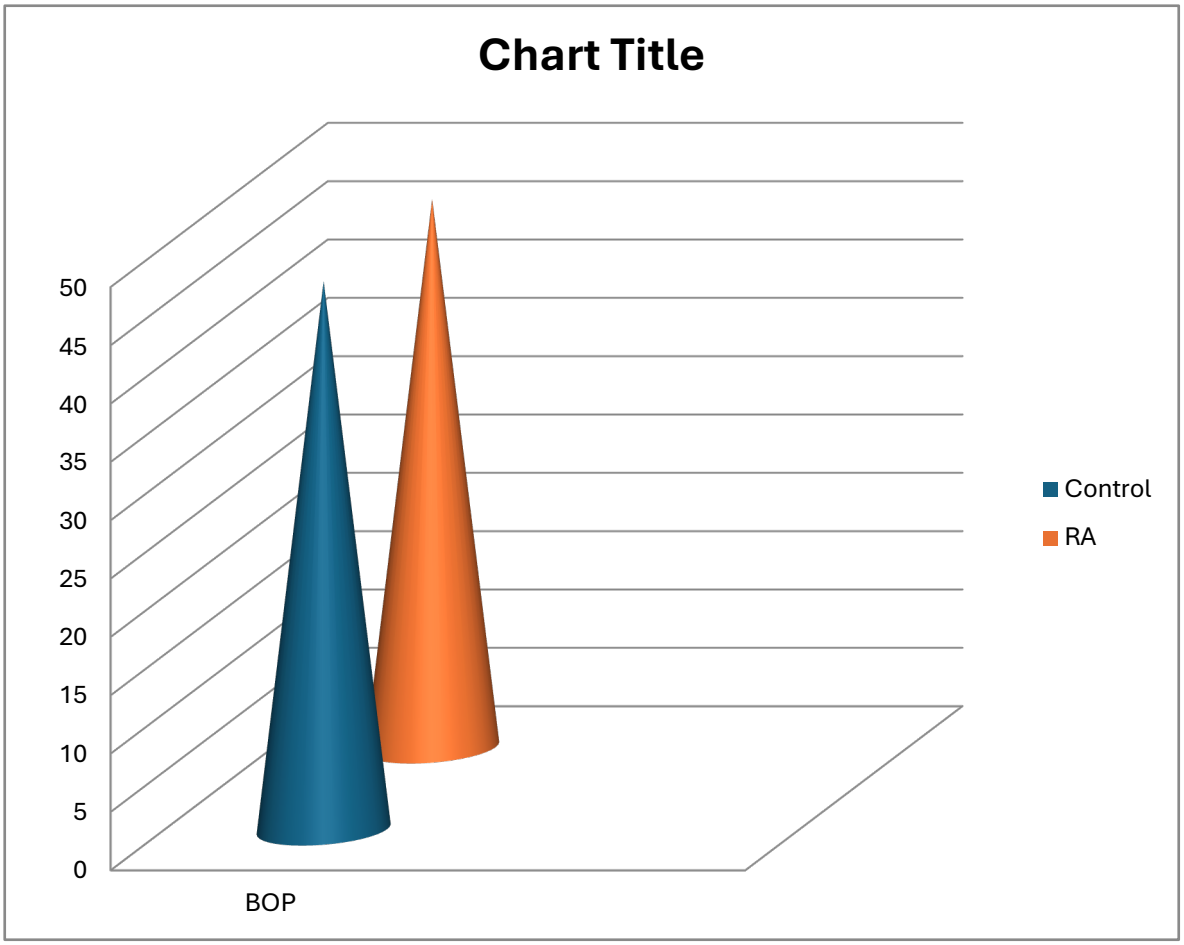
- P value- p<0.019
- Chi square - 69.01

PPD

2.7mm ± 0.7 (RA)

2.4mm ± 0.6 (control)

- P value- p<0.01
- Chi square - 49.01

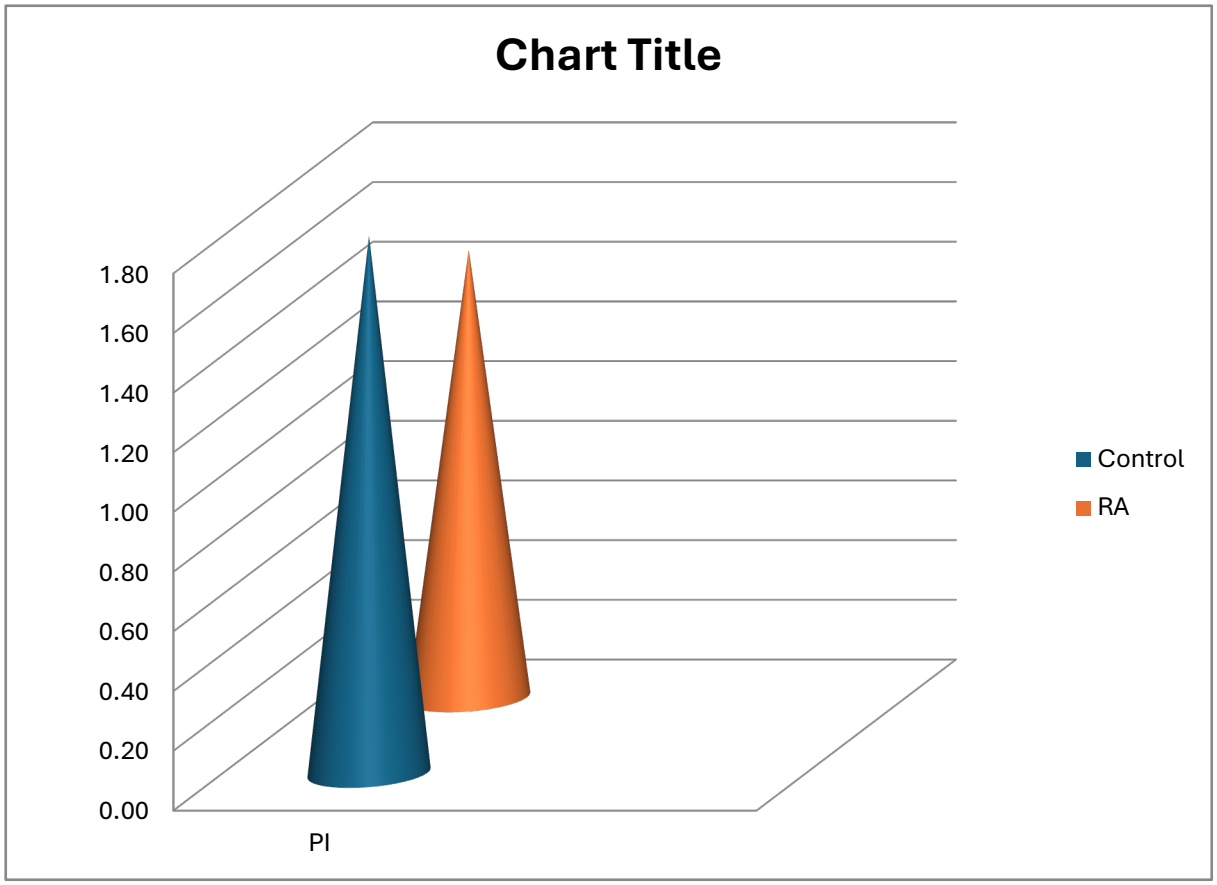


BOP

Mean value – 47.3% ± 17.3 (RA) ,

47.0% ± 27.4 (control)

- P value- p=0.75
- Chi square- 58.65



PI

Mean value – 1.5% ± 11.3 (RA) ,

1.8% ± 11.4(control)

- P value- p=0.53
- Chi square- 47.61

These findings indicate significantly higher CAL and PPD values in the RA group compared to controls, while BOP and PI showed no statistically significant difference.

DISCUSSION

The present study supports the hypothesis of a biological link between RA and PD. Patients with RA exhibited significantly greater periodontal attachment loss and probing depths compared to systemically healthy controls. These results are consistent with previous studies, which suggest that RA patients are more susceptible to periodontal destruction.[8,9,10]

Both diseases share:

- **Common inflammatory mediators**: Elevated CRP, TNF-α, and IL-1β levels.[11,12]
- **Pathogenic mechanisms:** Immune dysregulation leading to chronic tissue destruction.[13,14,15]
- **Microbial associations**: The periodontal pathogen *Porphyromonas gingivalis* has been implicated in citrullination of peptides, a process central to RA pathogenesis.[16,17,18,19]

Although BOP and PI did not differ significantly, the increased CAL and PPD in RA patients indicate

that RA contributes to periodontal breakdown independent of plaque levels.[20,21,22]

CONCLUSION

This study demonstrates a significant association between rheumatoid arthritis and periodontal disease, particularly in terms of attachment loss and probing depth.[23,24.25] These findings highlight the need for interdisciplinary management of RA patients, incorporating periodontal screening and care into routine rheumatologic practice. Further large-scale, longitudinal studies are warranted to establish the causal pathways and evaluate the impact of periodontal therapy on RA outcomes.

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