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## **Periodontitis In Psoriasis Patients – A Review**

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Psoriasis is a chronic inflammatory multi-system disease with predominantly skin and joint manifestations affecting approx. 2% of the general population. It is non-communicable, painful, disfiguring and disabling disease for which there is no cure. It is a T-cell mediated, autoimmune inflammatory disease which affects the immune system.

During their lifetime, around 20% of psoriasis patients develop inflammatory arthritis starting at bone sites presenting with various clinical phenotypes. In western countries, approximately two out of hundred people suffer from psoriasis and in about 30% of cases, the disease is classified as moderate to severe with more than 10% of the entire body surface affected.

The exact etiology of psoriasis is still not known, but it has been identified as a multifactorial disease involving both genetic and environmental factors. The epithelial changes are related to a defect in the control of keratinocyte proliferation characterized by increased proliferative activity of the cutaneous keratinocytes. One of important genetic risk factor is HLA-Cw6.

The age of onset of this disease is seen in two peaks :

1. EARLY ONSET PSORIASIS or TYPE I PSORIASIS → 15-25 years.
2. LATE ONSET PSORIASIS or TYPE II PSORIASIS → 57-60 years.

Current hypothesis about psoriasis pathogenesis focus on aberrant activation of the innate defense system with subsequent involvement of the adaptive immune system and consequent reactions both at the level of the skin epithelium and at the systemic level, eg: with increased circulating levels of inflammatory mediators.

Periodontitis is a chronic inflammatory infectious disease characterized by an immunologically moderated destruction of dental supporting tissues. It is the result of an exaggerated inflammatory response against polymicrobial colonization in the dental plaque. It is a common disease that affects approximately one-third of adults over 30 years of age and up to half of adults over 50 years of age. A survey conducted by the National Oral Health Program in the year 2016 notes that about 95% of adults in India suffers from gum disease.



Dental diseases also have immune-involvement with multiple causes & for Psoriasis it can cause problems in complex & intricate ways. Over the past several years, the association between periodontitis and immune-mediated inflammatory diseases has been increasingly recognized. It has been hypothesized that bacterial colonization in the oral cavity could trigger an exaggerated immune response in a susceptible host, leading to a perpetual inflammatory process associated with autoimmune disorders.

A long-standing focus on possible associations between periodontitis and general diseases has led to several clinical and epidemiological studies, suggesting a link between these two chronic, inflammatory conditions. A review related to the association between these two conditions is yet to be come forth.

#### PURPOSE OF THIS REVIEW.

To review the current literature on the association between Psoriasis & Periodontitis and the various treatment options.

## MATERIALS &amp; METHODS.

A search strategy based on the keywords “Psoriasis”, “Psoriatic Arthritis” and “Periodontitis” was performed in MEDLINE, PUBMED & GOOGLE SCHOLAR. Published studies from inception till October,2017 were selected, then obtained in full text & analyzed.

Studies included had to meet any of the following criteria’s:

- 1) Risk of Psoriasis in patients with & without Periodontitis.
- 2) Periodontitis patients with Psoriasis or Psoriatic Arthritis.

\*PPD – Probing pocket depth, GI- Gingival index, CAL – Clinical attachment level, PI – Plaque index.

No	STUDY	AIM	DESIGN	PARAMETER	RESULT	CONCLUSION
01	YAMADA et al, 1992.	To correlate the exacerbation of Psoriasis with exacerbation of periodontal disease.	CASE REPORT	*PPD *GI BIOPSY	1.Exacerbation of the cutaneous disease was accompanied by gingival epithelial changes & periodontal bursts. 2. Report on the light microscopy of biopsies from periodontal lesions revealed	Periodontal breakdown may be associated with exacerbation of gingival psoriasis.
02	YUSSUF et al, 2001.	Importance of	CASE CONTROL	*CAL *PI &*GI		Periodontal evaluation is an important procedure in

		Periodontal evaluation in Psoriatic Arthritis patients.		*PPD		psoriatic arthritis.
03	PREUS et al, 2010.	Role of Periodontitis in Psoriasis patients	CASE CONTROL	Alveolar bone loss on bitewing x-rays	1.Significantly lower radiographic bone level in Psoriasis cases. 2.Significantly higher number of missing teeth in Psoriasis cases.	Psoriasis patients experience more bone loss than age & gender matched controls.
04	RAHUL et al, 2011.	Association between Chronic Plaque Psoriasis & Plaque-Induced Chronic Periodontitis.	CROSS SECTIONAL	*PPD, *CAL, *GI, *PI, Alveolar bone loss.	1.Significantly higher GI,PI & increased PPD & tooth loss as compared to controls. 2.Significantly greater number of A.actinomycescomitans&P.gingivalis positive samples.	Significant increase in parameters of A. actinomycescomitans and P. gingivalis positive samples.
05	KELLER et al, 2012	Effect of CP & it's treatment on the subsequent risk of psoriasis.	COHORT	*PPD, *CAL.	Psoriasis patients who underwent a gingivectomy or periodontal flap surgery had only a slightly higher adjusted risk of	Study detected an increased risk for psoriasis among patients with CP.

		(TAIWAN)			Psoriasis than the comparison group.	
#BOP – Bleeding on probing, PPD – Pocket Probing depth, Ps – Psoriasis.						
06	FADEL et al, 2012	Assessment of risk of dental decay & periodontal disease in individuals with mild-to-mod chronic plaque Psoriasis & healthy controls.	CASE CONTROL	*PPD #BOP Alveolar bone level.	1. Individuals with Psoriasis had lower salivary pH, fewer remaining teeth, fewer sites with PD $\leq$ 4mm and lower radiographic alveolar bone level than individuals without Psoriasis. 2. Psoriatic arthritis individuals exhibited a lower stimulated salivary secretion rate than those without Psoriasis.	No diff. in profiles of dental decay, periodontal disease experience & risk between individuals with & without Ps.  Exact reason for tooth loss could not be identified.
07	LAZARIDOU et al, 2013	Association of Chronic Plaque Psoriasis & severe Periodontitis.	CASE CONTROL	PPD, OTHER INDICES.	1. Significant correlation were noted bet. Psoriasis & Periodontitis (OR=3.329) & Psoriasis & metabolic syndrome. (OR=2.293). 2. Non-significant relation bet.	Significant correlation noted bet. Ps & Periodontitis and Ps & Metabolic syndrome.

					Psoriasis & active smoking status was detected.(OR=1.04)	
08	NAKIB et al, 2013	Association of Periodontal disease with systemic inflammation & arising risks for autoimmune diseases (Ps) among nurses in US.	COHORT	Alveolar bone loss & loss of teeth.	1.In patients with mild-moderate-severe periodontal bone loss Psoriasis risk was higher as compared to those without periodontal bone loss(after adjusting for age, smoking, BMI, alcohol intake, physical activity & tooth loss). 2.Number of natural teeth & tooth loss was not associated with risk of Psoriasis.	History of periodontal bone loss may increase risk of subsequent Ps.  <u>LIMITATION</u> Based on self-reported measures.
09	USTUN et al, 2013	To determine the possible relationship bet. Periodontitis & Psoriatic arthritis(PsA)	CASE CONTROL	PPD, CAL, PI & GI.	1.The CAL levels of the PsA group were significantly higher than those of the control group. 2.No statistical significant differences in the frequency of periodontitis, PPD,	Periodontal evaluation must be considered when PsA is diagnosed.

					PI, GI between the two groups.	
10	PIETRZA K et al, 2013	Association between periodontal treatment and psoriasis.	CASE CONTROL	Various skin forms of Psoriasis.	Improvement in skin forms of Psoriasis after an adequate periodontal treatment.	Valid association between Periodontal treatment & Psoriasis.
11	KRANTI et al, 2013	Periodontal manifestation in a patient with Psoriasis.	CASE REPORT	INDICES. Biopsy of lesion. Blood investigation.		Severe periodontitis could have been a coincidental finding, unrelated to Psoriasis.  A definitive diagnosis of Psoriasis associated with Periodontitis can pose a significant challenge.
12	GANZETT I et al, 2014	Compare the prevalence of periodontal disease & alveolar bone loss among skin form Ps patients and healthy controls.	RCT	CAL GI & PI PPD BOP		Prevalence of moderate & severe forms of periodontitis & gingivitis was significantly higher among psoriasis patients.  Increased IL-1 $\beta$ , TNF- $\alpha$ but not IL-17A in saliva of patients with Ps.
13	ANTAL et al, 2014	Periodontitis associated Psoriasis in Smokers vs Non-	CASE CONTROL	BOP CAL PPD	1.Psoriasis in itself increased the likelihood of severe periodontal disease to OR=4.373 while	Smoking may have a permissive effect on the development of severe periodontal disease in patients with Psoriasis.



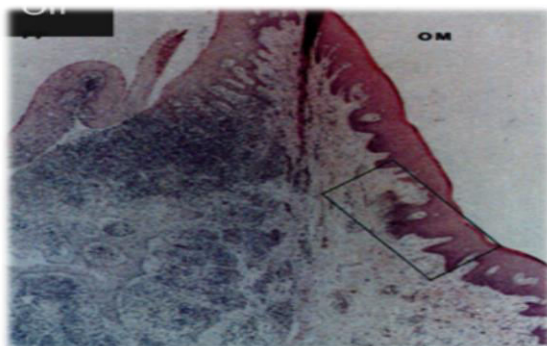
		smokers.			smoking increased it to OR=24.278. 2.Risk of severe periodontal disease in Psoriasis turned out to be 6 times higher in smokers than in non-smokers.	
14	RYSSTAD et al, 2014	Association between moderate to severe Psoriasis & Periodontitis in a Scandinavian population.	CROSS SECTIONAL	PPD CAL Alveolar bone loss.	1.Prevalence of moderate & severe periodontitis was significantly higher among Psoriasis individuals (24%) compared to healthy controls (10%). 2.Only 36% of Psoriasis cases had one or more sites with radiographic bone loss $\geq$ 3mm, compared to 13% of controls.	Periodontitis & Radiographic bone loss is more common among patients with moderate/severe Psoriasis compared with general population.
15	EGEBERG et al, 2016	Risk of Periodontitis in patients with Psoriasis & Psoriatic	COHORT	pH of saliva, PPD, Number of teeth. Smoking. Bone mineral	1.Overall increased risk of new-onset periodontitis in pts. with Psoriasis. 2.Increased risk of periodontitis in	Significant Psoriasis-associated increased risk of periodontitis, which was highest in patients with severe psoriasis & psoriatic arthritis.

		Arthritis.		density	mild psoriasis (IRR:1.66;1.43-1.94), severe psoriasis (IRR:2.24;1.46-3.44) & psoriatic arthritis (IRR:3.48;2.46-4.92).	
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## DISCUSSION

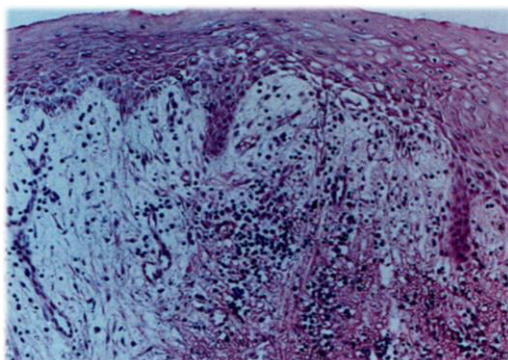
The strengths of the present review are the broad literature search, selection & evaluation of duplicate studies and summaries of the findings till date. There were no differences in profiles of dental decay & periodontal disease experience and risk between individuals with & without psoriasis. Fewer remaining teeth were observed in individuals with psoriasis but the exact reason for tooth loss could not be identified.

Smoking favors colonization by specific periodontopathic bacteria, modulates cellular immunity and favors the development and aggravation of autoimmune and immune-mediated conditions , including psoriasis . Smoking, appears to be a risk factor for both periodontal disease and psoriasis.



Lengthening & enlargement of oral epithelial rete pegs & elongation of dermal papillae.

Lack of proper oral hygiene can lead to infection of respiratory tract, which can result in CVD, frequent in psoriasis. A striking similarity between periodontitis & psoriasis is the presence of neutrophils in the gingival crevice & in psoriasis plaque form micro-abscesses in the stratum corneum. In 1903, OPPENHEIM reported the 1<sup>st</sup> oral psoriatic lesion.



Collection of inflammatory cells with thinning of epithelium

The clinical appearance of gingiva & the histological aspect of the biopsies substantiate a diagnosis of intraoral psoriasis-form gingival lesions.

As periodontal disease & psoriasis share several risk factors like smoking, obesity & DM; it is possible that the apparent increased risk of psoriasis in patients with periodontitis is a result of confounding rather than true casualty.

#### REASON BEHIND INCREASED RISK OF PSORIASIS IN PERIODONTITIS PATIENTS:

1) Exaggerated immune response to the residing microbiota at the epithelial surface are observed in both conditions which suggests a shared genetic predisposition affecting dendritic cells & toll-like receptor expression.

2) Activation of Th-17 cells & the increased expression of IL-17 (one of major players in the pathogenesis of both psoriasis and psoriatic arthritis) induced by the bacteria is involved in periodontal infection & their products.

#### IMPLICATIONS.

- 1) Psoriasis patients should maintain a good dental hygiene, in order to reduce as much as possible, the chance of a dental emergency event.
- 2) Psoriasis is a disease of great complexity. Therefore, an assessment risk scale should be adopted by dentists (“physical status classification system” from the ASA).
- 3) Psoriasis requires the observation of technical assumptions. ADA recommends professionals to adopt guidelines, prior to any interventions concerning to the degrees of coverage & invasiveness of each dental procedure before, during & after the consultation for psoriasis patients.

- 4) Oral adverse events are produced during conventional treatments for psoriasis or it's diseases.
- 5) A more conservative & less invasive dental treatment option should be undertaken depending upon the necessity & opportunity.
- 6) It is essential for a transparency between the patients & dentists regarding their clinical condition in detail.

#### FUTURE PERSPECTIVES:

[i] Larger population-based studies using broader sets of possible confounders should be conducted to establish whether periodontitis associated psoriasis is a cause or a consequence of disease severity.

[ii] Risk assessment of periodontitis in patients with psoriatic arthritis should be carried out in other populations.

[iii] Investigations are required to determine whether the association between periodontitis and psoriasis is casual.

[iv] To investigate whether there is any role of medicaments (immunosuppressants) on periodontitis in psoriasis patients with periodontitis.

**CONCLUSION:**

Within the limits of the present review, the concept about relationship between periodontitis and psoriasis has somewhat come to the conclusion that the radiographic bone loss is more common among patients with moderate/severe psoriasis as compared to the general population. Thus, these findings may imply a need for increased awareness and focus on periodontitis prevention for individuals with psoriasis.

The mechanisms underlying this association require more study and effects of targeted anti-inflammatory treatment, eg : IL-7 antibodies, on patients with periodontitis with concurrent psoriasis are warranted.

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