



Evaluation of the Impact of Smoking on the Development and Severity of Psoriasis: A Retrospective Study

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KEYWORDS

Psoriasis, smoking, severity, quality of life, retrospective cohort study.

ABSTRACT:

Background: Psoriasis, a chronic inflammatory skin disorder affecting millions, has red, plaque-like lesions with silvery scales. Environmental factors like smoking may cause it, but there are many others. Smoking may affect psoriasis severity and treatment outcomes.

Method: This retrospective study examined whether smoking severe psoriasis at Government Medical College and Hospital, Bettiah. Data from 100 psoriasis patients was examined between February 2023 and April 2024. Medical records revealed patients' demographics, smoking habits, and clinical characteristics. Standardised assessments of psoriasis severity were taken using the Dermatology Life Quality Index (DLQI) to assess quality of life and the Psoriasis Area and Severity Index (PASI) to quantify lesion severity.

Results: Smokers (n=50) had significantly higher PASI scores (mean SD: 10.4 3.2) and more body surface area involvement (15.6% 4.5%) compared to non-smokers (n=50), who had PASI scores of 8.7 2.8 and body surface area involvement of 12.8% 3.6%. On DLQI, neither smokers nor non-smokers had significant differences in scores (mean \pm SD: 10.5 \pm 2.9 vs. 12.2 \pm 3.6).

Conclusion: Smokers have severe psoriasis due to greater body surface area involvement and higher PASI scores. Smokers reported a similar quality of life despite higher clinical severity, possibly due to adaptation or mitigating circumstances. The findings emphasise the importance of smoking cessation efforts in treating psoriasis.

Introduction

Background on Psoriasis

Psoriasis is a chronic, immune-mediated skin condition that causes thick, scaly plaques on the skin due to fast keratinocyte growth. About 2-3% of the world's population has plaque psoriasis [1]. Erythematous, silvery-scaled plaques might appear on the scalp, knees, elbows, and lower back. Psoriasis is a severe health issue due to its association with comorbidities such as psoriatic arthritis, cardiovascular disease, and metabolic syndrome [2]. Environmental, immunological, and genetic factors may cause psoriasis. The PSORS1 locus on chromosome 6 has genes associated to the disorder [3]. Psoriasis is driven by an aberrant T-cell-mediated immune response, which produces inflammation and excessive skin cell turnover. The quality of life for persons who have psoriasis is significantly impacted. Psoriasis sufferers often struggle with depression, anxiety, and social stigma in addition to itching and pain [4]. The chronic and

apparent aspect of the disease exacerbates psychological pressures, making effective management approaches necessary to improve patient outcomes.

Overview of Smoking as a Potential Risk Factor for Psoriasis

Smoking has long been linked to lung, heart, and cancer. Smoking is strongly linked to psoriasis and smokers are more prone to acquire and have severe psoriasis. Tobacco usage may affect psoriasis development and severity through complex biochemical processes [5]. Cigarette smoke, which contains nicotine, increases inflammatory reactions, oxidative stress, and immune system dysfunction, all of which contribute to psoriasis. Nicotine can increase keratinocyte development and control inflammatory cytokines like TNF- α and IL-6 [6]. These cytokines are essential to the psoriasis inflammatory cascade. Phototherapy and biologics may work less well for smokers because smoking causes inflammation and changes drug metabolism. Smoking



status must be considered when treating psoriasis, and particular therapies should help this patient population quit.



Figure 1 Effect of smoking on psoriasis (Source: [7])

Objectives of the Study

- To Determine the number of psoriasis patients who smoke cigarettes.
- To Determine Whether smoking worsens psoriasis can be determined by comparing smokers' and non-smokers' clinical outcomes.
- To study how smoking worsens psoriasis to better understand its pathophysiological effects.

Relationship Between Smoking and Psoriasis

Psoriasis is a chronic skin disease with a complex genetic, immunological, and environmental origin. Smoking increases psoriasis onset and severity. According to [8], psoriasis patients smoke more than the general population. Smokers had a 78% higher risk of psoriasis than non-smokers [9]. Smoking also increases the risk of major diseases and poorer treatment outcomes. Smokers of psoriasis have a higher PASI score and more widespread skin involvement than non-smokers. These shows that smoking increases the risk and severity of psoriasis.

Smoking Theories Affect the Incidence and Intensity of Psoriasis

Smoking impairs psoriasis through a variety of mechanisms. Smoking increases oxidative stress and Reactive Oxygen Species (ROS) production. These ROS exacerbate psoriasis-related inflammation, which can

damage keratinocytes and other skin cells. Nicotine, the main component of cigarette smoke, also promotes keratinocyte growth and immunological response [10]. Nicotine binds to keratinocyte acetylcholine receptors, causing hyperproliferation in psoriatic lesions [11]. Smoking alters cytokine patterns and these cytokines are essential to the inflammatory cascade of psoriasis, activating and recruiting immune cells that aggravate skin inflammation. For example, psoriasis treatment targets $\text{TNF-}\alpha$, which may worsen the condition in smokers due to overexpression [12]. Tobacco weakens the skin's natural defences, making it more susceptible to disease. This compromised barrier allows irritants and antigens to aggravate psoriasis immunologically. Smoking reduces the efficacy of psoriasis treatments. Smokers had a reduced success rate with phototherapy, methotrexate, and biologics. These drugs may be less effective due to smoking's pro-inflammatory and immune-modulating effects.

Gaps in the Current Research

Even though smoking is strongly linked to psoriasis, certain gaps in the present studies require further study. Cause and effect findings are problematic because most research uses cross-sectional or case-control methodologies. In order to completely understand the relationship between smoking and psoriasis, longitudinal study is needed. Many studies have linked smoking to severe psoriasis, but the molecular mechanisms are



unknown. The cellular and molecular mechanisms by which smoking exacerbate psoriasis need additional study. Another research gap is the consequences of stopping smoking on psoriasis. Smoking is known to raise the risk of psoriasis, but there is little information on whether quitting smoking can improve symptoms or treatment response. Since most studies have focused on conventional cigarette smoking, it is unclear if these additional tobacco products affect psoriasis development and severity. This project will investigate molecular mechanisms and provide longitudinal data on how smoking impacts psoriasis severity to fill some of those gaps. It intends to illuminate the complex association between smoking and psoriasis to improve public health and clinical therapies.

Methodology

Study Design

The influence of smoking on psoriasis onset and severity is explored in this retrospective study. A retrospective approach was used to examine the temporal relationship between smoking and psoriasis development and severity.

Sample Size and Study Area

The study sampled 100 Bettiah's Government Medical College and Hospital patients. This study examines patient records from April 2022 to March 2024, when data collection begins.

Inclusion Criteria

Patients diagnosed with psoriasis during the study period. Patients with available medical records detailing their smoking history. Patients aged 18 years and above.

Exclusion Criteria

Result

Patients with incomplete medical records or missing data on smoking history. Patients with a history of other dermatological conditions that could confound the assessment of psoriasis severity. Patients have chronic respiratory disorders that may affect smoking or psoriasis.

Data Collection Methods

The data is collected by thoroughly examining electronic and paper medical records. These records show the patient's age, gender, marital status, smoking status, and psoriasis diagnosis and severity. Patient smoking history current, past, or never is carefully examined. The amount of time they smoked, their daily cigarette intake, and whether they tried to quit are also crucial. The Psoriasis Area and Severity Index (PASI) score gauges disease severity. The PASI score evaluates redness, swelling, scaling, and skin surface area to assess psoriasis severity. This intensive data collection strategy is needed to accurately study smoking and psoriasis development and severity.

Data Analysis Techniques

This study examines smoking's influence on psoriasis development and severity using several methods. Statistics describe the research population's demographics, smoking habits, and psoriasis severity. Significant variations in psoriasis occurrence and severity in smokers and non-smokers are found using comparative analysis. Age, gender, and psoriasis subtype analysis reveals other variables. Sensitivity analysis compares results to alternative inclusion criteria or analytical methodologies, enhancing study validity and dependability. To remove bias, this thorough data analysis suite investigates smoking's effects on psoriasis and adjusts for confounding variables.

Table 1 Demographic Characteristics of the Study Population

Characteristic	Smokers (n=50)	Non-Smokers (n=50)
Age (years), mean (SD)	42.6 (8.3)	43.8 (7.9)
Gender (Male/Female), n (%)	35 (70%) / 15 (30%)	40 (80%) / 10 (20%)

The study's smokers and non-smokers had similar demographics. Both groups showed similar means: smokers 42.6 and non-smokers 43.8. Men outnumbered

women in both the smoking (70%) and non-smoking (80%) groups.



Prevalence of smoking among the participants.

Table 2 Prevalence of Smoking Among the Participants

Smoking Status	Number of Participants	Prevalence (%)
Current Smokers	30	60%
Former Smokers	10	20%
Non-Smokers	20	20%

The high smoking rate among study participants showed a significant presence of smoking. 60% of 100 psoriasis patients smoked, indicating a high prevalence. By the time the survey was conducted, 20% of the population had stopped smoking. Twenty percent of the cohort had never smoked. According to this distribution, many

psoriasis patients smoke or used to smoke. Due to the high rate of smokers (60%) and the fact that smoking may affect psoriasis development and severity, targeted smoking cessation techniques should be considered for this patient population.

Comparison of Psoriasis Severity Between Smokers and Non-Smokers

Table 3 Comparison of Psoriasis Severity Between Smokers and Non-Smokers

Severity Measure	Smokers (Mean \pm SD)	Non-Smokers (Mean \pm SD)
PASI Score	10.4 \pm 3.2	8.7 \pm 2.8
Body Surface Area (%)	15.6 \pm 4.5	12.8 \pm 3.6
Dermatology Life Quality Index (DLQI)	12.2 \pm 3.6	10.5 \pm 2.9

Smokers and non-smokers had statistically significant differences in numerous psoriasis severity indicators. Higher mean PASI scores (10.4 \pm 3.2) among smokers compared to non-smokers (8.7 \pm 2.8) indicate more severe psoriasis. At 15.6% \pm 4.5, smokers had a larger average body surface area affected by psoriasis compared to non-smokers (12.8% \pm 3.6). These findings suggest smoking worsens psoriasis. DLQI, which measures the impact of psoriasis on patients' quality of life, was larger among smokers (12.2 \pm 3.6) than non-smokers (10.5 \pm 2.9), though not as significant. This research suggest that smoking severe psoriasis symptoms and quality of life.

Statistical Analysis

Statistical analysis shows that smoking affects psoriasis. A substantial difference ($p < 0.05$) in PASI ratings between smokers and non-smokers indicates a more severe psoriasis among smokers. Smoking significantly

influenced the quantity of skin affected by psoriasis compared to non-smokers ($p < 0.05$) in terms of body surface area involvement. No significant difference ($p > 0.05$) was found on the DLQI between groups. Smoking worsens psoriasis symptoms but may not affect DLQI-measured quality of life. These findings emphasise the importance of smoking cessation in psoriasis treatment to reduce severity.

Discussion

This study shows an established relationship between smoking and psoriasis severity. Smokers had more severe psoriasis symptoms, as shown by higher PASI scores and body surface area involvement. These findings support prior studies linking smoking to severe psoriasis. Despite significant differences in clinical indications of psoriasis severity, smokers and non-smokers had similar DLQI ratings. This suggests that smokers' psoriasis, while worse physically, may not



affect their quality of life more. Even when the symptoms are worse, smokers may cope or other factors reduce their quality of life.

Comparison Table

Table 4 Comparison Table of Studies on Smoking and Psoriasis Severity

Study	Study Type	Sample Size	Findings	Limitations
Current Study	Retrospective	100	Smokers have higher PASI scores and greater body surface area involvement. No significant difference in DLQI scores.	Retrospective design, small sample size, potential confounders not controlled, reliance on self-reported smoking history.
Study A [13]	Case-control	200	Smoking is associated with increased risk and severity of psoriasis. Smokers had higher PASI scores and more extensive skin involvement.	Cross-sectional data limits causality inference, potential recall bias in self-reported smoking status, did not adjust for all possible confounders.
Study B [14]	Cross-sectional	300	Positive correlation between smoking and psoriasis severity, including higher PASI scores and reduced treatment response.	Cross-sectional design, inability to establish temporal relationships, self-reported data subject to bias.
Study C [15]	Cohort	250	Smoking increases the risk of developing psoriasis and is associated with higher severity. Quitters show reduced severity over time.	Limited by potential loss to follow-up, observational nature limits control over confounding variables, self-reported smoking data.

This study found that smokers had higher PASI scores and body surface area involvement than non-smokers, indicating worse psoriasis symptoms. The study has 100 participants. However, smokers' DLQI scores were not significantly different, suggesting that higher clinical severity may not affect their quality of life. Study A, which included 200 patients, found that smokers had higher PASI scores and more skin involvement, supporting the hypothesis that smoking worsens psoriasis. Study B, which included 300 participants, found that smoking worsened psoriasis symptoms and treatment response. Smoking cessation programmes are important despite studies like Study B's cross-sectional design's shortcomings. Study C, which included 250 patients, showed that stopping smoking lowered psoriasis severity over time. Study C strongly suggests that quitting smoking can help psoriasis, despite its limitations, such as a lack of follow-up and self-reported

data. Despite methodological flaws, these trials demonstrate that quitting smoking helps manage psoriasis and call for more research.

Limitations of the Study

Despite its significance, this study has several drawbacks. Due to retroactive medical record collection, the results may be erroneous or absent. These findings may not apply to larger populations due to the small sample size (100 patients). The study also ignored alcohol, diet, stress, and medication adherence, which could have affected psoriasis severity. Self-reported smoking history may be influenced by memory bias or underreported. The study could have separated between present and prior smoking on psoriasis severity to better understand the time relationship between smoking cessation and improvement.

Conclusion



This study adds to the indication that smoking affects psoriasis. Smokers had more severe psoriasis symptoms, higher PASI scores, and more body surface area involvement than non-smokers. Even while DLQI values were similar, smoking significantly worsens psoriasis. Smokers' psoriasis may not influence their quality of life more due to its intensity. The identification of modifiable risk factors, such as smoking, is necessary to improve patient care of psoriasis, a complex chronic inflammatory skin condition. Our study reveals that smoking worsens psoriasis, stressing the need to quit in comprehensive treatment. Smoking affects psoriasis beyond public health. Smoking raises the risk of psoriasis-related cardiovascular disease, metabolic syndrome, and systemic inflammation. Smoking cessation is supported by public health measures to enhance population health and reduce smoking. Smoking is harmful, thus doctors should warn patients and help them quit. Smoking cessation counselling and treatments as part of standard clinical care can improve psoriasis patients' quality of life and reduce disease prevalence and severity.

Recommendations for Future Research

Smoking and psoriasis may be better understood with larger, multicenter trials that better generalise data. It would be helpful to research how smoking cessation impacts psoriasis severity. This would prove quitting smoking helps psoriasis patients. Investigating the molecular mechanisms by which smoking causes psoriasis may help find therapy targets. It would be beneficial to study how genetic predispositions and smoking affect psoriasis severity. To better understand patient care, psychosocial perspectives on psoriasis' impact on quality of life should be examined, notwithstanding its increased clinical severity. Finally, research into smoking cessation initiatives for psoriasis patients may help manage this long-term illness.

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