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ORIGINAL ARTICLE

Clinical and Biochemical impact of Low-Dose Atorvastatin in Psoriasis: A Case-Control Study

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ABSTRACT

Background: Psoriasis is a chronic immune-mediated inflammatory disorder associated with metabolic abnormalities, including dyslipidemia. Statins may provide lipid-lowering as well as anti-inflammatory benefits. Our objective is to evaluate the clinical and biochemical effects of low-dose atorvastatin in patients with psoriasis.

Methods: This case-control study was conducted at Hayatabad Medical Complex and Khyber Girls Medical College, Peshawar, Pakistan, from February to September 2018. Sixty adults with psoriasis of at least one year duration and confirmed dyslipidemia were allocated into two groups. The intervention group received atorvastatin 10 mg daily plus standard psoriasis treatment for 12 weeks, while the control group received standard treatment alone. Psoriasis Area and Severity Index (PASI) score and fasting lipid profile were assessed at baseline and after 12 weeks.

Results: Thirty participants were included in each group. The intervention group showed significant improvement in PASI score and lipid profile after 12 weeks. Mean PASI score decreased from 2.06±0.61 to 1.26±0.45 ($p<0.001$). Significant reductions were observed in total cholesterol, triglycerides, LDL cholesterol, and VLDL cholesterol, with an increase in HDL cholesterol ($p<0.001$). No significant changes were observed in the control group.

Conclusion: Low-dose atorvastatin may improve psoriasis severity and dyslipidemia when used as adjunct therapy. Larger multicenter trials are recommended.

Keywords: Psoriasis; Atorvastatin; Dyslipidemia; PASI; Randomized controlled trial.

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Introduction

Psoriasis is a chronic inflammatory skin disease characterized by erythematous scaly plaques and recurrent relapses. It affects approximately 2–3% of the global population and is increasingly recognized as a systemic disorder rather than an isolated skin condition. (1) Patients with psoriasis have higher rates of obesity, diabetes mellitus, hypertension, and dyslipidemia, which collectively increase cardiovascular risk. (2) Persistent systemic inflammation in psoriasis contributes to endothelial dysfunction and atherosclerosis. Dysregulated cytokines such as tumor necrosis factor-alpha, interleukin-6, and interleukin-17 play important roles in both psoriasis and metabolic disease.(3)

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Therefore, therapies that reduce inflammation and improve lipid abnormalities may provide additional clinical benefit. (4)
Statins are widely used for the management of dyslipidemia. Beyond lipid lowering, they exert pleiotropic anti-inflammatory and immunomodulatory effects. Previous studies have suggested that statins may reduce psoriasis severity; however, evidence remains inconsistent and many studies used moderate or high doses. Limited data are available regarding the effect of low-dose atorvastatin in local populations. (5)
This study aimed to determine whether atorvastatin 10 mg daily improves clinical severity and biochemical parameters(dyslipidemia) in patients with psoriasis.

Methods

This analytical case-control study was conducted at the Dermatology Unit, Hayatabad Medical Complex, and the research laboratory of Khyber Girls Medical College, Peshawar, after institutional ethical approval (letter no3293/PGMED/KGMC.
Adults aged 18 years or older with psoriasis of at least one-year duration and confirmed dyslipidemia were eligible. Exclusion criteria included smoking, body mass index ≥30 kg/m², diabetes mellitus, hypertension, pregnancy, and lactation, use of hormonal contraceptives, current lipid-lowering therapy, and normal lipid profile.
Sixty eligible participants were enrolled through consecutive sampling. These participants were allocated by consecutive enrollment method into two equal groups:

- **Case group:** atorvastatin 10 mg daily plus standard psoriasis treatment.
- **Control group:** standard psoriasis treatment alone.

Treatment duration was 12 weeks. Primary outcome was comparative change in PASI score. Secondary outcomes were changes in fasting lipid profile including total cholesterol, triglycerides, LDL cholesterol, HDL cholesterol, and VLDL cholesterol.
Clinical examination and PASI scoring were performed at baseline and week 12. Fasting venous blood samples were collected for biochemical analysis using standard enzymatic colorimetric methods.
Data were analyzed using SPSS version 21. Continuous variables are presented as mean±SD. Paired t-test and independent sample t-test were used where appropriate for within-group and between-group comparisons. A p-value <0.05 was considered statistically significant.

Results

A total of 60 participants were enrolled and allocated equally into intervention and control groups. Most baseline demographic and disease-related variables were comparable between the two groups, indicating appropriate group balance before treatment. No major adverse effects requiring discontinuation were reported during follow-up.At 12 weeks, participants receiving atorvastatin showed consistent improvement in both clinical severity and biochemical markers. Reduction in PASI score was accompanied by visible improvement in erythema, induration, and scaling as recorded during follow-up visits. Lipid parameters also improved in the intervention group, whereas changes in the control group were minimal.

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Table1. Mean PASI Score at Baseline and Week 12

Baseline	Intervention 2.06	Control 1.65
Week 12:	Intervention 1.26	Control 1.72

Baseline demographic characteristics were comparable between groups.

Table 2. Baseline Characteristics of Participants

Variable	Intervention (n=30)	Control (n=30)
Mean age (years)	34.5	38.3
Female sex, n (%)	10 (33.3)	14 (46.7)
Mean disease duration (years)	6.16	6.44
Baseline PASI score	2.06	1.65

Table 3. Changes After 12 Weeks

Parameter	Intervention	Control
PASI score	Significant decrease	No significant change
Total cholesterol	Decreased	No significant change
Triglycerides	Decreased	No significant change
LDL cholesterol	Decreased	No significant change
HDL cholesterol	Increased	No significant change
VLDL cholesterol	Decreased	No significant change

The intervention group demonstrated significant improvement in clinical severity scores and lipid parameters after treatment ($p<0.001$).

Discussion

This case-control study demonstrated that low-dose atorvastatin use was associated with significant improvement in psoriasis severity and lipid profile over the study period.

The present study demonstrated that adjunctive low-dose atorvastatin therapy was associated with significant improvement in psoriasis severity and serum lipid abnormalities over a 12-week period. These findings are clinically relevant because psoriasis is increasingly recognized as a multisystem inflammatory disorder with increased cardiometabolic risk.(6)

Statins inhibit HMG-CoA reductase and reduce cholesterol synthesis, but they also exert anti-inflammatory effects through improvement of endothelial function, reduction in oxidative stress, and modulation of inflammatory mediators. These pleiotropic properties may explain the reduction in PASI score observed in our cohort.

The biochemical improvement seen in total cholesterol, triglycerides, LDL cholesterol, and HDL cholesterol may reduce long-term cardiovascular risk in patients with psoriasis. Since cardiovascular morbidity is higher in moderate-to-severe psoriasis, early identification and treatment of dyslipidemia is important. (7)

Our findings are generally consistent with previous studies reporting benefit of statins in psoriasis, although published data remain heterogeneous because of differences in statin dose, disease severity, treatment duration, and concurrent therapies. Low-dose regimens may be particularly useful in patients requiring lipid control with potential dermatologic benefit. These findings further support the current understanding that psoriasis is closely linked with systemic inflammation and metabolic dysfunction. (8)

The observed reduction in PASI score may be explained by the anti-inflammatory effects of atorvastatin, including modulation of cytokine activity and improvement in endothelial function. Improvement in serum lipids is clinically relevant because cardiovascular disease risk is elevated in psoriasis. (9)

Previous studies evaluating statin therapy in

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psoriasis have reported variable outcomes. (5, 10) Differences may reflect dose variation, disease severity, sample size, and treatment duration. Our results suggest that even a low dose may provide clinical benefit while potentially offering better tolerability than higher-dose regimens.

From a practical perspective, atorvastatin is widely available, relatively inexpensive, and familiar to clinicians. If future studies confirm these findings, it may represent a rational adjunctive option in selected psoriasis patients with dyslipidemia.

Conclusion

In this case-control study, low-dose atorvastatin was associated with improved psoriasis severity and favorable lipid profile changes. so it is a useful adjunctive option While causation cannot be definitively established. Larger allocated multicenter studies are required.

Limitations

As an observational case-control study, residual confounding and selection bias cannot be fully excluded.

The study had a small sample size, single-center design, and short follow-up period. Long-term efficacy and safety were not assessed.

Conflict of Interest: Nil
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Data acquisition, analysis and interpretation	FRB,SN,
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All the authors agree to take responsibility for every facet of the work, making sure that any concerns about its integrity or veracity are thoroughly examined and addressed.	