Biological and Clinical Sciences Research Journal
eISSN: 2708-2261; pISSN: 2958-4728
www.bcsrj.com
DOI: https://doi.org/10.54112/bcsrj.v6i7.1863
*Biol. Clin. Sci. Res. J., Volume 6(7), **2025**: 1863*
Original Research Article

Comparison of Low-Dose Isotretinoin and Conventional Dosing Regime for the Management of Acne Vulgaris

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(Received, 24th May 2025, Accepted 8th July 2025, Published 31st July 2025)

Abstract: *Acne vulgaris is a prevalent dermatological condition that significantly affects quality of life. Although isotretinoin is the gold-standard treatment for moderate to severe acne, its conventional dosing is often associated with considerable side effects, prompting investigation into low-dose regimens for comparable efficacy with improved tolerability.* ***Objective:*** *To compare the efficacy and safety of low-dose isotretinoin versus a conventional dosing regimen in patients with moderate to severe acne vulgaris.* ***Methodology:*** *An observational comparative study was conducted with 120 patients aged 14 years or older, equally divided into two treatment groups. Group A received conventional-dose isotretinoin (80 mg/day) while Group B received low-dose isotretinoin (20 mg/day). Acne severity was assessed at baseline using GAGS scores, with moderate acne classified as 19–30 and severe acne as 31–38. Efficacy was evaluated by calculating the percentage reduction in GAGS scores after 12 weeks, categorized as slight (<30%), moderate (30–50%), good (50–80%), or excellent (>80%). An excellent GAGS score was considered adequate. Safety was monitored through clinical assessments of common side effects (e.g., dry skin and dry eyes.* ***Results:*** *The low-dose group exhibited higher efficacy with 70% of patients achieving excellent improvement (>80% GAGS score reduction) compared to 45% in the conventional-dose group. Adverse effects were notably lower in the low-dose group: dry skin (8.3% vs. 16.7%) and dry eyes (10% vs. 20%).* ***Conclusion:*** *Low-dose isotretinoin is an effective and safer alternative to conventional dosing for moderate to severe acne.*

Keywords: acne vulgaris, isotretinoin, low-dose, conventional-dose, efficacy, safety, Global Acne Grading System

[***How to Cite:*** Ghani U, Bakhtawar A, Tariq I. Comparison of low-dose isotretinoin and conventional dosing regimen for the management of acne vulgaris. *Biol. Clin. Sci. Res. J.*, **2025;** 6(7): 19-22. doi: https://doi.org/10.54112/bcsrj.v6i7.1863

Introduction

Acne is an ongoing inflammatory disorder of pilosebaceous follicles affecting individuals globally. Acne is predicted to impact 9.4% of the worldwide population, establishing it as the eighth most prevalent skin disease. Acne affects over 85% of adolescents and can persist into adulthood, particularly among females, accounting for two-thirds of dermatological consultations for the disease (1). The unique lesions can be categorised as non-inflammatory as well as inflammatory, resulting in developing scars as well as pigmentation on skin, which requires broadened as well as ongoing treatment (2). Lesions are commonly found on the face, upper back, and chest. Such acne variations clinically as well as histologically resemble acne vulgaris; however, they can be differentiated by clinical situation, severity, as well as accompanying symptoms (3-5).

The latest developments within acne therapy focus on combination treatments that target various pathogenic factors that underlie the condition. The latest literature on the treatment of acne outlines various topical applications as well as emerging strategies for effective acne management. This includes topical treatments that address abnormal hyperkeratinization in the infundibulum, as well as innovative topical retinoids displaying anti-inflammatory effects (6-10). Isotretinoin is the most significant pharmacological advancement in the treatment of acne. Current practices recommend a cumulative oral isotretinoin dosage of 120-150 mg/kg for the management of severe acne. Nonetheless, widespread dose-dependent side effects have prompted researchers to explore alternative protocols. Recent studies have proposed a safer regimen with lower doses for oral isotretinoin that is nearly as efficacious, while additional research has not shown any significant alternatives. Low-dose isotretinoin is currently utilised in the treatment of acne using different regimens, such as daily dosing, intermittent therapy, alternate-day treatment, or a gradual rise in the daily dose. (11-13)

Acne vulgaris is a common chronic inflammatory skin condition that significantly impacts the quality of life. Isotretinoin is highly effective for moderate to severe and treatment-resistant acne. Comparing the therapeutic outcomes and safety profiles between low-dose and conventional-dose isotretinoin regimens is crucial to optimize acne management strategies as well as improve patient-centered care.

Methodology

This observational comparative study was conducted at the Department of Dermatology from October 2024 to April 2025 at Nawaz Sharif Social Hospital, Lahore. We enrolled 120 patients with moderate to severe acne vulgaris, aged 14 years or older, and divided them equally into two groups. The severity of acne was objectively assessed using the Global Acne Grading System (GAGS), where moderate acne was defined by a GAGS score of 19 to 30 and severe acne by a score of 31 to 38. Patients in Group A received conventional-dose isotretinoin at 80 mg per day while those in Group B were administered a low-dose regimen of 20 mg per day. Treatment efficacy was evaluated after 12 weeks by calculating the percentage decrease in GAGS scores from baseline. The formula used was: Percentage decrease in GAGS score = (Total decrease in score/baseline score) × 100. Clinical improvement was categorized as slight (<30% decrease), moderate (30–50% decrease), good (50–80% decrease), and excellent (>80% decrease). An excellent decrease was considered adequate. This approach provided a quantifiable and reproducible measure of treatment response, minimizing subjective bias in efficacy assessment.

Safety monitoring was conducted through regular clinical evaluations for common isotretinoin-related side effects such as dry skin and dry eyes at

the end of treatment. Statistical analysis was performed using appropriate tests to compare efficacy and safety outcomes between the two groups, with a p-value ≤0.05 considered statistically notable.

Results

Our study had 120 participants evenly divided into two groups, Group A (conventional isotretinoin regimen) and Group B (low-dose regimen). The mean age of participants in Group A was 22.28±8.31 years, while in Group B it was 23.70±9.44 years. Body mass index (BMI) was 26.39±2.87 kg/m² in group A and 26.34±2.67 kg/m² in group B.

Females were in the majority in both cohorts, 43 (71.7%) in Group A and 46 (76.7%) in Group B (Table 1).

GAGS outcomes demonstrated that the low-dose regimen (Group B) achieved superior results with 42 (70.0%) participants exhibiting excellent improvement compared to 27 (45.0%) in the conventional-dose group (Group A). Moderate improvement was observed in 16 (26.7%) cases in Group A and 8 (13.3%) in Group B (P = 0.04). Notably, the low-dose group also reported fewer adverse effects. Dry skin occurred in 10 (16.7%) cases in Group A and 5 (8.3%) in Group B, while dry eyes affected 12 (20.0%) cases in Group A and 6 (10.0%) in Group B (P = 0.08) (Table 2). Figure 1 presents the efficacy of the treatment in both groups.

Table 1 Demographics

Demographics		Groups			
		Group A		Group B	
		n	%	n	%
Age distribution (Years)	14 to 25	47	78.3%	44	73.3%
	26 to 35	8	13.3%	7	11.7%
	36 to 50	5	8.3%	9	15.0%
Gender	Male	17	28.3%	14	23.3%
	Female	43	71.7%	46	76.7%
Duration of disease (Months)	1 to 4	43	71.7%	45	75.0%
	> 4	17	28.3%	15	25.0%

Table 2: Efficacy and safety profile

GAGS score and safety profile		Groups				P value
		Group A		Group B		
		n	%	n	%	
GAGS score	Excellent	27	45.0%	42	70.0%	0.04
	Good	7	11.7%	5	8.3%	
	Moderate	16	26.7%	8	13.3%	
	Slight	10	16.7%	5	8.3%	
Safety profile	Dry skin	10	16.7%	5	8.3%	0.08
	Dry eyes	12	20.0%	6	10.0%	
	No side effects	38	63.3%	49	81.7%	

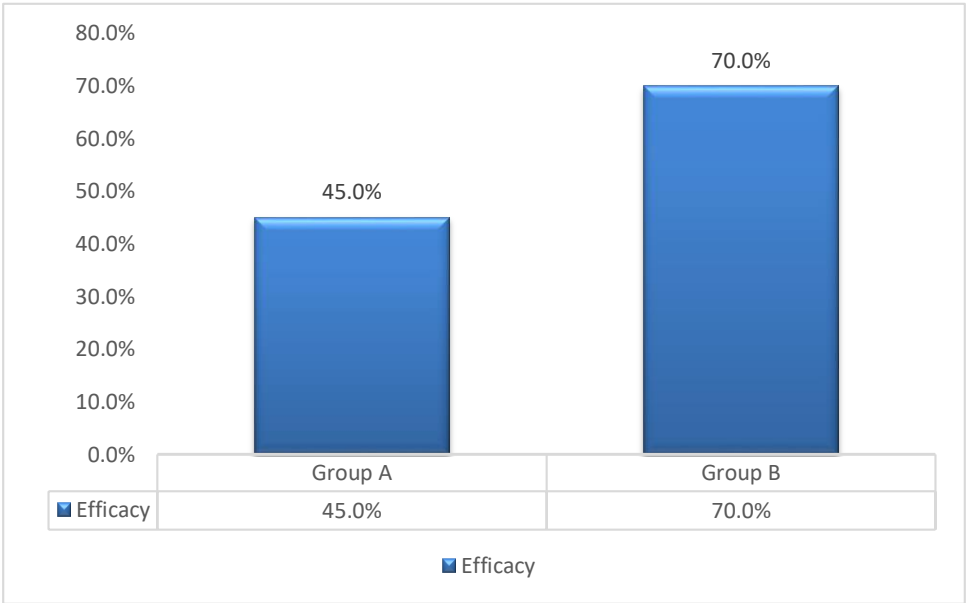

Figure 1 Efficacy of Low-Dose Isotretinoin

Discussion

The findings of this study align with and expand upon existing research on the efficacy and safety of low-dose isotretinoin compared to conventional dosing in acne vulgaris. Our results demonstrate that the low-dose regimen achieved a higher rate of excellent clinical improvement (70.0%) compared to the conventional-dose group (45.0%) with fewer reported side effects. This supports previous studies suggesting that lower doses of isotretinoin can be equally or even more effective for mild to moderate acne while reducing adverse effects. (14)
The superior efficacy of low-dose isotretinoin in our study is consistent with the findings of Sardana et al., who documented an 87.54% response rate with 20 mg alternate-day dosing combined with topical clindamycin. (15) Similarly, Amichai et al. observed a 93% improvement in moderate acne patients treated with 20 mg/day isotretinoin, reinforcing the idea that lower doses can yield substantial benefits without the need for high cumulative exposure. (16) However, our results contrast slightly with Hafeez et al., who found conventional dosing (80 mg/day) more effective (71.4%) than low-dose (20mg/day) in moderate to severe acne. (17)
One of the most compelling aspects of our findings is the substantially lower incidence of side effects in the low-dose group. Dry skin affected only 8.3% of low-dose patients and 16.7% in the conventional group, while dry eyes were reported in 10.0% and 20.0% respectively. These results mirror those of Faghihi et al., where low-dose isotretinoin (0.25 mg/kg/day) resulted in fewer cases of dry nose (17%) compared to conventional dosing (33.2%). (18) Additionally, Rao et al. (2014) noted that low-dose isotretinoin (20 mg/day) was well-tolerated, with cheilitis being the most common side effect, but systemic effects like hyperlipidemia were rare. (19) Our study further supports these observations with 81.7% of low-dose patients experiencing no side effects compared to 63.3% in the conventional group.
Our study population was predominantly young, and females were more prevalent, which is consistent with the demographic trends seen in Niazi et al.'s study. (14) In our study, females were more frequently represented, possibly reflecting higher healthcare-seeking behavior for acne.
Although our study did not assess long-term relapse, the high efficacy of low-dose isotretinoin suggests potential for sustained remission. The relapse rate of both treatment groups has been reported to be comparable. (14) Rao et al have also documented a lower relapse rate in lower dosages; they also reported that lower dosages are more cost-effective than higher dosages. (19) Further research is needed to determine the optimal duration and dosing frequency for minimizing relapse in low-dose therapy.
Based on our findings and corroborating evidence, low-dose isotretinoin appears to be an excellent option for moderate to severe acne, offering a more effective and safe treatment for the condition. Future studies should explore long-term outcomes, including relapse rates and the impact of cumulative dosing, to refine treatment protocols further.

Conclusion

In conclusion, a lower dose regimen of oral isotretinoin is substantially more effective than a conventional dosing regimen in the treatment of moderate to severe acne vulgaris.

Declarations

Data Availability statement
All data generated or analysed during the study are included in the manuscript.
Ethics approval and consent to participate
Approved by the department concerned. (IRB)
Consent for publication
Approved
Funding
Not applicable

Conflict of interest

The authors declared the absence of a conflict of interest.

Author Contribution

UG (Postgraduate Resident)
Study Design, Conception of Study, Review of Literature, Critical Input
AB (Junior Clinical Fellow)
Review of Literature, Data entry, Data analysis, and drafting articles.
IT (House Officer)
Conception of Study, Development of Research Methodology Design,

All authors reviewed the results and approved the final version of the manuscript. They are also accountable for the integrity of the study.

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