

Isotretinoin 0.75mg Versus Azithromycin 500mg in the Treatment of Acne Vulgaris – A Comparative Study

Nafis Iqbal Fahim^{1*}, Nazmun Nahar², and Nilufar Maharuf Mim¹

¹Department of Pharmacy, Jashore University of Science and Technology, Jashore, Bangladesh

²Department of Pharmacy, Stamford University, Dhaka, Bangladesh

*Corresponding author:

Nafis Iqbal Fahim, Department of Pharmacy, Jashore University of Science and Technology, Jashore, Bangladesh.

ABSTRACT

Introduction: Acne vulgaris is an inflammation condition of the skin that is very common in the age 11 to 30 years with more than 80 percent of the population. It entails various pathogenic factors such as augmented sebum production, follicular keratinization, bacterial colonization and inflammation. The object of this study was to compare the efficacy and safety of oral isotretinoin and azithromycin in the management of moderate to severe acne vulgaris.

Methods: 120 patients aged 15 to 40 years and having grade 45 acne (according to the US FDA global score) were recruited into test study; the study was conducted in Jashore Sadar Hospital and Queens Hospital (Pvt) Ltd. Bangladesh between February and December 2024. Patients were selected randomly in two equal groups, i.e., Group A where the treatment was isotretinoin 0.75 mg/kg daily during five months, Group B where the treatment was azithromycin 500 mg three times a week during three months. The Global Acnes Grading System (GAGS) and index of total acnes load were used to measure clinical improvement, acnes grading, and adverse effects after every month.

Results: The overall cure rate of Isotretinoin (0.75 mg/kg/day) was 100% with 63.33% of the patients of the trial showed an excellent response whereas azithromycin (500 mg thrice weekly) was 80% cure rate among them 21.66% was excellent & 20% of the patients did not respond yet. Isotretinoin had mild side effects like dry skin, loss of hair whereas azithromycin had few side effects.

Conclusions: Isotretinoin and azithromycin were both effective in the management of moderate to severe acne, but isotretinoin had a greater effect and a wider scope of treatment of all pathogenic factors. Its use is still preferable to total management of acne as long as it is monitored properly.

Keywords: Acne Vulgaris, Isotretinoin, Azithromycin, Comparative Study, Moderate to Severe Acne, Treatment Efficacy, Clinical Response.

Received: June 09, 2026;

Accepted: June 16, 2026;

Published: June 23, 2026

Introduction

Acne is a chronic inflammatory disease. More than 80% people, especially adult between the ages of 11 to 30 are mostly affected this disease. The main reason for acne is unknown. Basically, increased sebum production, keratinocyte hyperproliferation, inflammation, and hormonal changes are the major causes of acne development [1]. It is a multifaceted illness. Regarding the treatment of acne,

four major principles govern the therapy: a) decrease sebaceous gland activity, b) correct the altered pattern of follicular keratinization, c) decrease the follicular bacterial population, and d) anti-inflammatory effects [2]. When used in combination, treatment including benzoyl peroxide, salicylic acid, azelaic acid, intralesional steroid infiltration, black light, laser, retinoids, and antibiotics typically enhance control of mild to moderate acne [3].

Citation: YNafis Iqbal Fahim, Nazmun Nahar, and Nilufar Maharuf Mim (2026) Isotretinoin 0.75mg Versus Azithromycin 500mg in the Treatment of Acne Vulgaris –A Comparative Study. J Clin Case Med Rep 2: 1-4.

The most effective treatment oral Isotretinoin, is administered early in cases of severe disease, but its usage is restricted by toxicity and other negative effects. Numerous antimicrobials have been utilized to treat acne during the past 50 years [4]. As primary antibiotics for acne, tetracyclines and macrolides, most frequently erythromycin, have been used. Since bacteria are growing more resistant to erythromycin, many doctors now treat acne using azithromycin for acne, a different macrolide [5]. On the other hand, Isotretinoin (also known as 13-cis-retinoic acid) mainly vitamin A which is used to treat severe nodular acne that has not responded to other treatments including antibiotics [6]. Here we conducted a comparative study of Isotretinoin 0.75 mg versus azithromycin 500 mg in the treatment of acne vulgaris.

Study Selection

The efficacy of isotretinoin and azithromycin in treating acne was compared in an experimental investigation. The study was conducted among 120 patients of acne, aged 15-40 years with severe nodulocystic acne patients with grade 4 and 5 acne according to the US FDA global score in the Department of Dermatology and Venereology in JASHORE SADAR HOSPITAL and QUEENS HOSPITAL (PVT) LTD. Jashore, Khulna, Bangladesh during a period from February 2024 to December 2024. The Global Acne Grading Score, or GAGS, was used to determine cases with moderate to severe acne.

US FDA Global Acne Score System

0 = Normal, clear skin with no evidence of acne vulgaris

1 = Skin is almost clear: rare non-inflammatory lesions present, with rare non-inflamed papules (papules must be resolving and may be hyperpigmented, though not pink-red)

2 = Some non-inflammatory lesions are present, with few inflammatory lesions (papules/pustules only; no nodulo-cystic lesions)

3 = Non-inflammatory lesions predominate, with multiple inflammatory lesions evident: several to many comedones and papules/pustules, and there may or may not be one small nodulo-cystic lesion

4 = Inflammatory lesions are more apparent: many comedones and papules/pustules, there may or may not be a few nodulo-cystic lesions

5 = Highly inflammatory lesions predominate: variable number of comedones, many papules/pustules nodulo-cystic lesions [7]

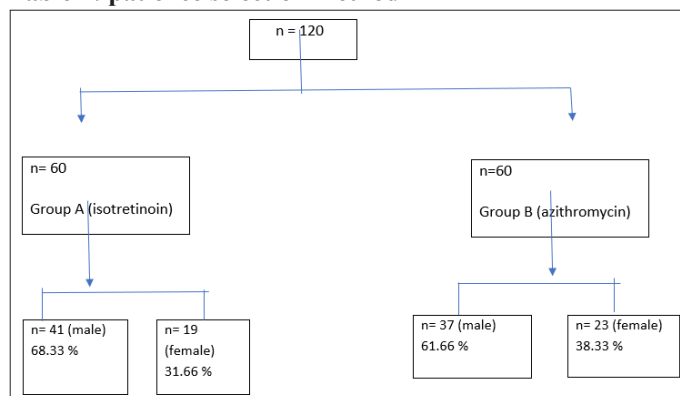
Method

At first primarily selected 160 patients. Among them 15 patients were not co-operate us and another 25 patients were not meet up our demand because of US FDA global acne score system. Finally selected 120 patients who were educated, informed about adherence, consistent monitoring, adverse effects, and avoiding other oral medication.

Two equal patient groups, A and B, were randomly assigned. For five months, Group A received isotretinoin at a dose of 0.75 mg/kg body weight every day, depending on the severity of the condition, and Group B received azithromycin 500 mg three times per week for three months. Patients were checked on every month to evaluate the disease. During the five-month treatment stages and the six-month monitoring period, patients were

evaluated for clinical improvement, acne grades, and adverse effects. A total of 11 months were expended on monitoring.

Table 1: patient selection method



Before starting the isotretinoin therapy and at monthly checkups, liver function tests (ALT, AST, GGT, and ALP) and lipid profiles (total cholesterol and triglyceride) were checked. For the duration of the isotretinoin therapy, these tests were carried out every single month.

All cases were diagnosed clinically. The institutional ethics committee granted its approval to the study.

Total acne load was calculated on the basis of Definition Severity Index which was calculated as follows:

- Non-inflamed comedones, open and closed (no erythema) – 0.5
- Comedones/papules with surrounding erythema – 1
- Superficial pustules < 2 mm with no or little erythema – 1
- Pustules with a diameter > 2 mm – 2
- Pustules with a significant erythema – 2
- Deep infiltrates with or without pustules/ nodules/ isolated cysts – 3[8]

Total acne load can be calculated by multiplying the total number of each type of lesion with its severity index and adding them all together.

Total acne load = ((number of severity index 0.5 lesions)* 0.5) + ((number of severity index 1 lesions)* 1) + ((number of severity index 2 lesions)* 2) + ((number of severity index 3 lesions)* 3) [9]

Results

120 patients in all were enrolled in the study (60 in group A and 60 in group B) (Table 1). 42 (35%) females and 78 males (65% each) made up the group. The age in both the groups ranged from 15 to 40 years. Group A reported a mean age of 21.45±2.35 years, whereas group B reported a mean age of 20.65±2.25. The age range of 21 to 30 years old were the largest proportion of patients in both groups. 40 patients (66.66%) in group A and 33 patients (55%) in group B had the highest percentage of patients suffering moderate acne. Less than six months to more than twelve months was the period in which the illness persisted.

Table 2: data presented age, severity of acne and duration of disease

	Group A (isotretinoin) n = 60	Group B (azithromycin) n = 60
Male	41 (68.33%)	37 (61.66 %)
female	19 (31.66%)	23 (38.33 %)
Age:		
Mean (years)	21.45 ± 2.35	20.65 ± 2.25
15-20 years	17(28.33 %)	13 (21.66%)
21-30years	25 (41.66%)	28 (46.66%)
31-40 years	18 (30%)	19 (31.66)
Severity of acne:		
Mild		
Moderate	40 (66.66%)	33 (55%)
Severe	20 (33.33%)	27 (45%)
Duration of disease:		
3-6 months	12(20%)	17(28.33%)
6-12 months	19(31.66%)	24(40%)
12-24 months	29(48.33%)	19(31.66%)

The data presented in Table 2 evaluated the effectiveness of both medications. Every patient in group A gave a response. In group A, the clinical response was deemed excellent 38 (63.33%), good 13(21.66%), fair 7(11.66%), and poor 2 (3.33%). Clinical response was seen in group B, and it was Excellent 13(21.66%), good in 21(35%), fair in 8(13.33%), poor in 6(10%), and no response in 12(20%) cases.

Table 2 also displays the clinical response in patients with varying illness severity. In group A, of the 43 patients with moderate acne, 27 had an excellent response (62.79%), and 9 had a good response (20.93%), 5 had fair (11.6%) and 2 of them poor response (3.33%). In contrast, of the 17 cases with severe acne, 11 had an excellent response (64.70%) ,4 had a good response (23.52%), 2 of them fair (11.76%) and had no poor response on severe acne.

On the other hand, group B, of the 49 patients with moderate acne, 11 had an excellent response (22.44%), and 17 had a good response (34.69%), 7 had fair (14.28%), 4 of them poor response (8.16%) and 10 (20.40%) showed no response. In contrast, of the 11 cases with severe acne, 2 had an excellent response (18.88%), 4 had a good response (36.36%), 1 of them fair (9.09%), 2(18.18%) had poor and 2(18.18%) showed no response.

Table 3: data presented the Clinical response

Clinical response	Group A (n=60)			Group B (n=60)		
	Total	Moderate acne	Severe acne	Total	Moderate acne	Severe acne
Excellent	38 (63.33%)	27 (62.79%)	11(64.70%)	13 (21.66%)	11 (22.44%)	2 (18.88%)
Good	13 (21.66%)	9 (20.93%)	4 (23.52%)	21 (35%)	17 (34.69%)	4 (36.36%)
Fair	7 (11.66%)	5 (11.62%)	2 (11.76%)	8 (13.33%)	7 (14.28%)	1 (9.09%)
Poor	2 (3.33%)	2 (4.65%)	0	6 (10%)	4 (8.16%)	2 (18.18%)
No response	----	----	----	12 (20%)	10 (20.40%)	2 (18.18%)

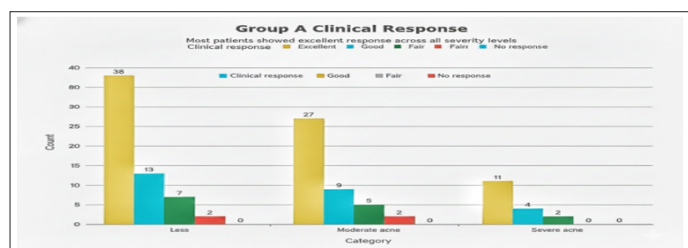


Figure 1: Group A Clinical Response

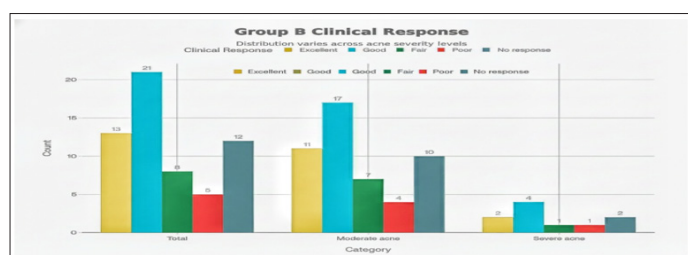


Figure 2: Group B Clinical Response

Discussion

The average age of the patients in this study was 21.45±2.35 years for group A and 20.65±2.25 years for group B. They were between the ages of 15 and 40. In our study, there were 42 (35%) females and 78 (65%) males. There were 19 (31.66%) female cases and 41 (68.33%) male cases in group A. However, in group B, there were 23 particulars (38.33%) that were female and 37 cases (61.66%) that were male. Therefore, there was a male preponderance in both groups. Since most of our study was hospital-based, the male preponderance can be clarified through the fact that fewer female patients typically undergo treatment in hospitals in our culture.

In the present study, duration of the disease varied from less than 6 months to more than 12 months. The maximum number of patients had acne for 6 to 12 months. Since topical medications are less successful for treating moderate to severe forms of acne, systemic medications should always be taken into consideration [10].

The present study compared the efficacy of regular isotretinoin dose and weekly pulse dose azithromycin in 120 patients having moderate to severe type of acne.

A study by Dr. Mahima Arora reported a cure rate of 79.03 ± 13.12 with oral isotretinoin [11].

Another study done by Tina Holst Larsen found $85 \pm 10\%$ improvement with isotretinoin [12]. In our study, cure rate with isotretinoin (group A) was 100%.

Singhi et al. found a 77.3% improvement with pulse dose azithromycin in another research [13]. In this present study, the cure rate with pulse dose azithromycin in group B was 80%.

Isotretinoin acts on the following four factors that make people prone to have acne: inflammation, P. acnes, blocked pores, and excessive sebum production [14]. Azithromycin, on the other hand, inhibits RNA-dependent protein synthesis by entering the cells of susceptible bacteria and reversibly binding to the 50-S subunit of the ribosome [15]. Isotretinoin side effects include dry skin, chapped lips, elevated serum lipid levels, joint and bone pain, depression, hair loss, headaches, impaired vision, and more [16].

In our study dryness of skin, anxiety, loss of hair was found after the treatment and transient elevation of serum lipid was found in only 2 cases that did not hamper the study in group A. In group B, no serious side effect was noted.

According to the results of our investigation, moderate to severe acne can be effectively treated with both isotretinoin and azithromycin. However, because isotretinoin treats all acne-causing variables, it is preferable than a weekly pulse dosage of azithromycin.

Conclusion

There is therapeutic effectiveness of both oral isotretinoin and pulse-dose azithromycin, using analyzed clinical data of 120 patients with moderate to severe acne vulgaris, isotretinoin is much more effective. The overall cure rate of Isotretinoin (0.75 mg/kg/day) was 100 percent in this study with 63.33 percent of the patients of the trial reported an excellent response as compared to 21.66 percent of patients in the azithromycin cohort. Conversely, azithromycin (500 mg thrice weekly) was 80% cure; 20% of the patients (especially those with severe cases of acne) did not respond. The best and comprehensive treatment option on the clinical treatment of acne vulgaris continues to be oral isotretinoin despite the fact that both (isotretinoin & azithromycin) treatments are efficacious in the treatment of moderate and severe acne vulgaris.

References

- Behrangi E, Somayeh S, Sadeghzadeh-Bazargan A, Azadeh G, Mohammadreza G, et al. (2019) The effect of metformin in the treatment of intractable and late onset acne: a comparison with oral isotretinoin. 22: 47–52.
- Wahab A, Rahman MH, Monamie NS, Jamaluddin M, Khondker L, et al. (2008) Isotretinoin versus weekly pulse dose azithromycin in the treatment of acne-a comparative study. J Pak Assoc Dermatol 18: 9-14.
- Yuan Y, Wang Y, Xia J, Liu H, Liu JP, et al. (2024) Topical, light-based, and complementary interventions for acne: an overview of systematic reviews. Cochrane Database Syst Rev 10: CD014918.
- Edileia Bagatin, Caroline Sousa Costa (2020) The use of isotretinoin for acne – an update on optimal dosing, surveillance, and adverse effects. Expert Rev Clin Pharmacol 13: 885-897.
- Karadag AS, Aslan Kayiran M, Wu C-Y, Chen W, Parish LC (2020) Antibiotic resistance in acne: changes, consequences and concerns. J Eur Acad Dermatol Venereol 35: 73-78.
- Sitohang IBS (2020) Isotretinoin for Treating Acne Vulgaris. Int. J. Appl. Pharm 13: 20–25.
- Samer A. Dhaheer, Muhammed R Luaibi (2016) Efficacy and Safety of Combined Isotretinoin and Azithromycin for Treatment of Severe Nodulocystic Acne. Med. J. BASRAH Univ 34.
- Uma Shankar Agarwal, Raj Kumar Besarwal, Kalyani Bhola (2011) Oral isotretinoin in different dose regimens for acne vulgaris: a randomized comparative trial. Indian J Dermatol Venereol Lepro 177: 688-694.
- Sardana K, Garg VK, Sehgal VN, Mahajan S, Bhushan P (2009) Efficacy of fixed low-dose isotretinoin (20 mg, alternate days) with topical clindamycin gel in moderately severe acne vulgaris. Eur. Acad. Dermatology Venereol 23: 556-560.
- Wolverton SE, Jashin J Wu (2019) Comprehensive dermatologic drug therapy. Elsevier Health Sciences.
- Mahima Arora, Niraj, Chirag Chadha, Hanamant Ganapati Bobade, Maitri M Patel (2025) A comparative study of oral isotretinoin alone vs oral isotretinoin with azithromycin pulse therapy in the treatment of moderate to severe acne vulgaris. Int. J. Life Sci. Biotechnol. Pharma Res 14.
- Tina Holst Larsen, Gregor B E Jemec (2003) Acne: comparing hormonal approaches to antibiotics and isotretinoin. Expert Opin Pharmacother 4: 1097-1103.
- Naseema Kapadia, Abu Talib (2004) Acne treated successfully with azithromycin. Int J Dermatol 43: 766-767.
- Melnik BC (2023) Acne Transcriptomics: Fundamentals of Acne Pathogenesis and Isotretinoin Treatment. Cells 12: 2600.
- Chukwudi CU (2016) rRNA Binding Sites and the Molecular Mechanism of Action of the Tetracyclines. Antimicrob Agents Chemother 60: 4433–4441.
- Mahsoub NII, Elsohaby MA, Hasan AM, Ismael AF (2024) Most Common Isotretinoin Therapy Side Effects on Egyptian Acne Females in Dakahlia Governorate. Egypt. J. Hosp. Med 96: 2860-2870.