Original Article
DOI: https://doi.org/10.70749/ijbr.v3i1.458

INDUS JOURNAL OF BIOSCIENCE RESEARCH
https://induspublishers.com/IJBR
ISSN: 2960-2793/ 2960-2807

Comparison of Efficacy of Dapsone 5% Gel Vs Clindamycin 1% Gel in Mild to Moderate Acne Vulgaris

Soonha Iqra[1], Rabia Ghafoor[1], Asif Ali[2], Misbah Zari Qadir[1], Muhammad Khurram[1]

[1]Department Dermatology, Hospital Jinnah Postgraduate Medical Centre, Karachi, Sindh, Pakistan.
[2]Department of Orthopedic Surgery, Shaheed Mohtarma Benazir Bhutto Institute of Trauma, Karachi, Sindh, Pakistan.

ARTICLE INFO

Keywords

Acne Vulgaris, Dapsone 5% Gel, Clindamycin 1% Gel, Efficacy.

Corresponding Author: Soonha Iqra, Department Dermatology, Hospital Jinnah Postgraduate Medical Centre, Karachi, Sindh, Pakistan.
Email: iqranazir34@gmail.com

Declaration

Author's Contributions: All authors contributed to the study and approved the final manuscript.
Conflict of Interest: No conflict of interest.
Funding: No funding received by the authors.

Article History

Received: 28-11-2024
Revised: 25-12-2024
Accepted: 01-01-2025

ABSTRACT

Background and Aim: Acne vulgaris is the most prevalent dermatology condition causing pleomorphic disorder that usually affects individual aged 12 to 25 years with varying prevalence from 50% to 95% in various countries. It can have a significant psychological impact on young people as it primarily affects their face. The present study aimed measure the efficacy of clindamycin 1% versus dapsone 5% gel in patients with mild to moderate acne vulgaris. **Materials and Methods:** This randomized controlled trial investigated 64 acne vulgaris cases (mild-moderate) in the outpatient department of Dermatology, Jinnah Postgraduate Medical Center (JPMC), Karachi from April 2024 to September 2024. Acne vulgaris patients of either gender having age 20 to 65 years enrolled. Patients were categorized into two groups: Group-I (CLINDAMYCIN 1% GEL) (N=32) and Group-II (DAPSONE 5% GEL) (N=32). Each group received clindamycin 1% gel or dapsone 5% gel once daily night for 12 weeks (about 3 months). Global Acne Grading Scale used for improved efficacy in both groups. Patients achieving post-treatment score ≤ 18 referred as efficacy. Data analysis done using SPSS version 27. **Results:** The overall mean age of Group-I and Group-II patients was 25.64±6.50 years and 23.96±4.82 years, respectively. Of the total 64 patients, there were 29 (45.3%) male and 35 (54.7%) female. Female patients dominated both groups. Clindamycin group showed promising outcomes in terms of efficacy than Dapsone group. A significant variance in efficacy observed in stratification by age and gender, particularly among patients with duration of acne onset ≤ 3 months. **Conclusion:** Clindamycin 1% gel showed promising results in terms of effectiveness and efficacy in treating acne vulgaris as compared to Dapsone 5% gel, allowing for once-daily topical application for 12 weeks (3 months).

INTRODUCTION

Acne vulgaris (AV) is a common skin disease that affects the pilosebaceous unit, characterized by both non-inflammatory lesions such as open and closed comedones and inflammatory lesions such as papules, pustules, and nodules, often result in varying degrees of scarring [1]. AV pathogenesis includes changes in the follicular keratinization layer that lead to the production of comedone, increases production of androgen-regulating sebum, colonization of hair follicles by "acne Propionibacterium" and complex inflammatory mechanisms involved in multiple innate and acquired immunity [2, 3]. The onset and spread of acne generally begins during adolescence affects approximately 85% of people at some point in their lives [4]. Although it is more common in teenagers due to hormonal changes, but it can affect people of all ages. The immune system reacts to bacteria and other factors that causes inflammation. This causes redness, swelling and discomfort. The contributing factors are influenced by many factors such as family history and twin studies show a genetic predisposition to acne, high glycemic load foods (such as sugary snacks), milk and chocolate are associated with Acne in some studies and environment: exposure from certain work may come from chemicals or oils that make acne worse [5, 6].

There are many acne treatment options available from topical treatments to systemic treatment. Treating mild to moderate acne often requires a combination of topical antibiotics. Topical treatments offer the benefit of ease of use and fewer side effects. Antibiotics, azelaic acid, retinoids, salicylic acid, and combination antibiotics are topical treatment for acne vulgaris [7]. Clindamycin antibiotics are effective in preventing infections caused by bacteria such as Streptococcus and Staphylococcus. Also, act against Propionibacterial acne

in the case of inflamed acne. Topical clindamycin is an established treatment for mild to moderate acne on its own or used in conjunction with other systemic treatments [8]. Major side effects of topical treatment are rare, though some cases of pseudomembranous colitis have been reported with topical clindamycin use. Other side effects include local skin irritation symptoms (redness and peeling), generally caused by the base ingredients of the formula. Antibiotic alone can adversely affect the acne treatment by increasing the risk of bacterial resistance, which emphasized on the alternate treatment modality for treating acne vulgaris [9].

Dapsone, a sulfone used orally to treat acne, having limited uses due to risk of systemic absorption and associated toxicity [10]. Clinical studies have shown that dapsone gel 5% is effective in treating inflammatory acne, with approximately 1% the systemic absorption seen with typical oral dapsone. Topical dapsone gel has been developed to provide the same antimicrobial and anti-inflammatory benefits to reduce systemic exposure [11]. The dual action of dapsone could provide physicians with a variety of new monotherapies to target acne. However, there have been no direct comparison studies between topical clindamycin and dapsone. The study aimed to compare the efficacy of clindamycin 1% versus dapsone 5% gel in patients with acne vulgaris.

METHODOLOGY

This randomized controlled trial investigated 64 acne vulgaris cases (mild-moderate) in the outpatient department of Dermatology, Jinnah Postgraduate Medical Center (JPMC), Karachi from April 2024 to September 2024. Acne vulgaris patients of either gender having age 20 to 65 years enrolled. Pregnant and lactating females as well as those with known hypersensitivity or previous allergic reaction to any of the active components of the study medication, females with hyperandrogenism states, and patients taking systemic antibiotic or retinoid for the last three months or using topical treatments of acne for the last two weeks, were excluded. Patients were categorized into two groups: Group-I (CLINDAMYCIN 1% GEL) (N=32) and Group-II (DAPSONE 5% GEL) (N=32). Each group received clindamycin 1% gel or dapsone 5% gel once daily night for 12 weeks (about 3 months). Global Acne Grading Scale used for improved efficacy in both groups. Patients achieving post-treatment score $\leq$ 18 referred as efficacy. A detailed medical history including previous medical history, medications used, onset of acne, personal record and other related information collected. Patients were followed up every four weeks for 12 weeks (3 months).

SPSS version 27 used for descriptive statistics. Quantitative variables such as age and duration of acne expressed as mean and standard deviation whereas qualitative variables such as efficacy and gender presented as frequency and percentages. Chi-square test used to compare the two groups regarding treatment efficacy. Effect modifiers controlled by stratifying the data by age, sex, and duration of acne vulgaris. A p value ≤ 0.05 considered statistically significant.

RESULTS

The overall mean age of Group-I and Group-II patients was 25.64±6.50 years and 23.96±4.82 years, respectively. Of the total 64 patients, there were 29 (45.3%) male and 35 (54.7%) female. Female patients dominated both groups. Clindamycin group showed promising outcomes in terms of efficacy than Dispone group. A significant variance in efficacy observed in stratification by age and gender, particularly among patients with duration of acne onset ≤ 3 months. Patient's distribution based on their age were as follows; 29 (45.3%) 20-35 years, 17 (26.6%) 36-50 years, and 18 (28.1%) 51-65 years. Majority of patients belonged to age group 20 to 35 years. There were 14 (43.8%) male and 18 (54.2%) female in Group-I whereas 15 (46.9%) male and 17 (53.1%) female in Group-II. Efficacy was seen in 84.4% (n=27) of patients in Group-I, and 15.6% (n=5) of patients in Group-II. Demographic details and baseline characteristics are shown in Table-I. Comparison of various clinical details of both groups presented as Table-II. Table-III represents the stratification of efficacy for different parameters such as age, gender, and duration of Acne.

Table 1

Demographic details and baseline characteristics (N=64)

Variables	Value [N (%)]
Mean Age (years)	24.8±5.66
Age Groups (years)	
20-35	29 (45.3%)
36-50	17 (26.6%)
51-65	18 (28.1%)
Gender	
Male	29 (45.3%)
Female	35 (54.7%)
Acne Vulgaris duration (Months)	
≤ 3	34 (53.1%)
≥ 3	30 (46.9%)

Table 2

Comparison of various clinical details of both groups (N=64)

Variables	Group-I (CLINDAMYCIN 1% GEL) N=32	Group-II (DAPSONE 5% GEL) N=32
Mean Age (years)	25.64±6.50	23.96±4.82
Age Groups (years)		
20-35	16 (53.2%)	13 (44.8%)
36-50	8 (47.1%)	9 (52.9%)
51-65	8 (44.4%)	10 (53.6%)
Gender		
Male	16 (55.1%)	13 (54.9%)

Female	16 (45.7%)	19 (54.3%)
Acne Vulgaris duration (Months)		
≤ 3	15 (44.1%)	19 (55.9%)
≥ 3	17 (56.7%)	13 (43.3%)

Table 3
stratification of efficacy for different parameters such as age, gender, and duration of Acne.

Variables	EFFICACY Group-I (CLINDAMYCIN 1% GEL) N=32		EFFICACY Group-II (DAPSONE 5% GEL) N=32		P-value
	Yes (N=27)	No (N=5)	Yes (N=5)	No (N=27)	0.001
Age Groups (years)					
20-35	15 (46.9%)	1 (3.1%)	2 (6.3%)	14 (43.8%)	
36-50	6 (18.8%)	2 (6.3%)	1 (3.1%)	7 (21.9%)	
51-65	6 (18.8%)	2 (6.3%)	2 (6.3%)	6 (18.8%)	
Gender					
Male	10 (31.3%)	2 (6.3%)	2 (6.3%)	14 (43.8%)	
Female	16 (50%)	3 (14.3%)	3 (9.4%)	13 (40.6%)	
Acne Vulgaris duration (Months)					
≤ 3	17 (53.1%)	2 (6.3%)	3 (9.4%)	12 (37.5%)	
≥ 3	10 (31.3%)	3 (9.4%)	2 (6.3%)	15 (46.9%)	

DISCUSSION

The present study mainly focused on the comparison of Dapsone 5% gel with Clindamycin 1% gel for the mild to moderate acne vulgaris treatment and reported that Clindamycin 1% gel showed promising results in terms of efficacy and fewer side effects. Acne is one of the most common conditions affecting teenagers and has significant effects on the patient's quality of life affecting self-esteem and psychosocial development. Topical clindamycin is an established and effective treatment for mild to moderate acne whether used alone or in conjunction with other systematic treatments. Its effectiveness is comparable to that of systemic tetracycline, topical erythromycin and topical benzoyl peroxide [12-14]. Although important side effects are rare with topical clindamycin, however, local skin irritation such as redness and peeling has been reported. It may occur mainly due to formula driving. Importantly, using antibiotics alone increases bacterial resistance and reduces their effectiveness in treating acne. This reinforces the need to develop new acne treatment options [15, 16].

The present study reported higher efficacy of Clindamycin as compared to Dapsone in treating acne vulgaris. Contrarily, multiple studies showed the effectiveness of dapsone in treating acne [17, 18]. An earlier Randomized controlled trials reported a significant reduction in inflammatory acne treated with the clindamycin gel when compared with the dapsone [19].

According to an earlier study, it was found that acne begins more frequently in women than in men. The highest prevalence found in people aged 20-35 years, followed by a gradual decrease with age [20]. Studies have also found that men are more likely to develop acne in their teens, while women are more likely to have acne in adulthood [21]. This is in consistence with the findings of the present study.

Systemic therapy, indicated for moderate to severe inflammatory acne while topical medications are usually preferred for mild to moderate cases. This is because acne primarily affects younger people. Potential side effects of systemic agents are therefore an important limiting factor in their use. A major problem in the use of antibiotics is the development of resistance, which is especially common with Macrolides and Quinolones. Tetracycline, considered as the cornerstone of oral antibiotic therapy for acne. Although clindamycin is highly effective, but it is rarely used as an oral therapy because it can cause serious side effects, such as pseudomembranous colitis. Topical clindamycin remains an accepted acne treatment option. It is effective against Staphylococcus, Streptococcus, and Acne Propionibacterium [22].

Dapsone has anti-inflammatory and antimicrobial properties, which may affect its effectiveness in treating acne. It shows strong activity against Propionibacterium species including Acne Propionibacterium. Clinical trials confirmed the effectiveness and safety of Dapsone 5% gel in treating acne vulgaris either alone or combined [23]. These results highlight the importance of tailoring acne treatment based on individual patient characteristics and response. Significant differences in efficacy were observed between clindamycin and dapsone. It emphasizes the need for physicians to consider the mechanism of action and patient history specifically when selecting topical treatments for acne.

CONCLUSION

Clindamycin 1% gel showed promising results in terms of effectiveness and efficacy in treating acne vulgaris as compared to Dapsone 5% gel, allowing for once-daily topical application for 12 weeks (3 months).

REFERENCES

1. Verma, R., Yadav, P., Chudhari, M., Patel, J., & Umrigar, D. (2022). Comparison of efficacy of two topical drug therapy of acne vulgaris – 1% clindamycin versus 5% dapsone: A split face comparative study. *National Journal of Physiology, Pharmacy and Pharmacology*, (0), 1. https://doi.org/10.5455/njppp.2022.12.03100202221042022
2. Sanawar, P., Ghafoor, R., Jabeen, N., Asadullah, K., Qadir, M., & Siddiqui, F. I. (2024). Comparison of the efficacy of clindamycin phosphate gel 1% versus once-daily dapsone gel 5% in the treatment of

moderate acne vulgaris at the tertiary care hospital, Karachi. *Journal of Population Therapeutics and Clinical Pharmacology*, 157-162. https://doi.org/10.53555/jptcp.v31i1.3947

3. Brar, B. K., Kumar, S., & Sethi, N. (2016). Comparative evaluation of dapsone 5% gel vs. clindamycin 1% gel in mild to moderate acne vulgaris. *Gulf J Dermatol Venereol*, *23*(1), 34-9. https://www.gulfdermajournal.net/pdf/2016-04/6.pdf
4. Tan, A., Schlosser, B., & Paller, A. (2018). A review of diagnosis and treatment of acne in adult female patients. *International Journal of Women's Dermatology*, *4*(2), 56-71. https://doi.org/10.1016/j.ijwd.2017.10.006
5. Stotland, M., Shalita, A. R., & Kissling, R. F. (2009). Dapsone 5% gel. *American Journal of Clinical Dermatology*, *10*(4), 221-227. https://doi.org/10.2165/00128071-200910040-00002
6. Draelos, Z. D., Carter, E., Maloney, J. M., Elewski, B., Poulin, Y., Lynde, C., & Garrett, S. (2007). Two randomized studies demonstrate the efficacy and safety of dapsone gel, 5% for the treatment of acne vulgaris. *Journal of the American Academy of Dermatology*, *56*(3), 439.e1-439.e10. https://doi.org/10.1016/j.jaad.2006.10.005
7. AL-mosawi, R. O., Hassan, J. K., & AL-tameemi, F. F. (2022). Comparative evaluation of topical antibiotics in treatment of mild to moderate acne vulgaris. *INTERNATIONAL JOURNAL OF DRUG DELIVERY TECHNOLOGY*, *12*(04), 1924-1927. https://doi.org/10.25258/ijddt.12.4.74
8. Mansour Al-Ani, Y. (2019). Assessment of efficacy and safety of dapsone gel 5% in the treatment of acne vulgaris. *AL-Kindy College Medical Journal*, *15*(1), 136-162.
9. Pickert, A., & Raimer, S. (2009). An evaluation of dapsone gel 5% in the treatment of acne vulgaris. *Expert Opinion on Pharmacotherapy*, *10*(9), 1515-1521. https://doi.org/10.1517/14656560903002097
10. Tuchayi, S. M., Alexander, T., Nadkarni, A., & Feldman, S. R. (2016). Interventions to increase adherence to acne treatment. *Patient Preference and Adherence*, *10*, 2091-2096. https://doi.org/10.2147/ppa.s117437
11. Dhaher, S., & Jasim, Z. (2018). The adjunctive effect of desloratadine on the combined azithromycin and isotretinoin in the treatment of severe acne: Randomized clinical trial. *Journal of Dermatology and Dermatologic Surgery*, *22*(1), 21. https://doi.org/10.4103/jdds.jdds_7_18
12. Del Rosso, J. Q., Kircik, L., & Tanghetti, E. (2018). Management of truncal acne vulgaris with topical dapsone 7.5% gel. *The Journal of clinical and aesthetic dermatology*, *11*(8), 45.
13. Kakpovbia, E. E., Young, T., Milam, E. C., Qian, Y., Yassin, S., Nicholson, J., Hu, J., Troxel, A. B., & Nagler, A. R. (2024). Efficacy of topical treatments for mild-to-moderate acne: A systematic review and meta-analysis of randomized control trials. *Journal of the European Academy of Dermatology and Venereology*. https://doi.org/10.1111/jdv.20154
14. Tan, S. T., Yohanes Firmansyah, Hendsun Hendsun, Alicia Sarijuwita, William Gilbert Satyanegara, Joshua Kurniawan, & Dean Ascha Wijaya. (2024). Cross-sectional study of efficacy, effectiveness, and safety of combination creams (Tretinoin 0.05%, clindamycin 3%, and Dexamethasone 0.05%) anti-acne – An online study. *Bioscientia Medicina : Journal of Biomedicine and Translational Research*, *8*(4), 4192-4200. https://doi.org/10.37275/bsm.v8i4.956
15. Yang DJ, Quan LT, Hsu S. (2007). Topical antibacterial agents. In: Wolverton SE, editor. comprehensive dermatologic drug therapy. 2nd ed. Philadelphia: Saunders Elsevier. pp. 525-46.
16. Shalita, A. R., Myers, J. A., Krochmal, L., & Yaroshinsky, A. (2005). The safety and efficacy of clindamycin phosphate foam 1% versus clindamycin phosphate topical gel 1% for the treatment of acne vulgaris. *Journal of drugs in dermatology: JDD*, *4*(1), 48-56. https://europepmc.org/article/med/15696985
17. Jr, O. M., Thornsberry, C., Cardin, C. W., Smiles, K. A., & Leyden, J. J. (2002). Bacterial Resistance and Therapeutic Outcome Following Three Months of Topical Acne Therapy with 2% Erythromycin Gel Versus Its Vehicle. *Acta Dermato-Venereologica*, *82*(4), 260–265. https://doi.org/10.1080/000155502320323216
18. Chatterjee, S., Choudhury, S., Sarkar, D., & Dutta, R. (2011). Efficacy and safety of topical nadifloxacin and benzoyl peroxide versus clindamycin and benzoyl peroxide in acne vulgaris: A randomized controlled trial. *Indian Journal of Pharmacology*, *43*(6), 628. https://doi.org/10.4103/0253-7613.89815
19. Piette, W. W., Taylor, S., Pariser, D., Jarratt, M., Sheth, P., & Wilson, D. (2008). Hematologic safety of dapsone gel, 5%, for topical treatment of acne vulgaris. *Archives of Dermatology*, *144*(12). https://doi.org/10.1001/archdermatol.2008.518

20. Islam R., Islam, M. N., & Mosharraf Hossain, M. (2021). An assessment of the efficacy and safety of dapsone gel: Study in a local setting. *Scholars Journal of Applied Medical Sciences*, *9*(4), 549-553. https://doi.org/10.36347/sjams.2021.v09i04.012
21. Ramrakha, S., Fergusson, D., Horwood, L., Dalgard, F., Ambler, A., Kokaua, J., Milne, B., & Poulton, R. (2016). Cumulative mental health consequences of acne: 23-year follow-up in a general population birth cohort study. *British Journal of Dermatology*, *175*(5), 1079-1081. https://doi.org/10.1111/bjd.13786
22. Al-Salama, Z. T., & Deeks, E. D. (2016). Dapsone 7.5% gel: A review in acne vulgaris. *American Journal of Clinical Dermatology*, *18*(1), 139-145. https://doi.org/10.1007/s40257-016-0242-0
23. Hatem, A. S., Fatma, M. M., Amal, K. H., Hossam, M. A., & Maha, H. R. (2018). Dapsone in topical niosomes for treatment of acne vulgaris. *African Journal of Pharmacy and Pharmacology*, *12*(18), 221-230. https://doi.org/10.5897/ajpp2018.4925