

# Comparison of efficacy of topical 5% dapsone versus 1% clindamycin in mild to moderate acne vulgaris

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## Abstract

**Background** Acne vulgaris is one of most common skin disorders, particularly among teenagers and adults. Recently, topical dapsone gel has been used as an alternative therapeutic option for mild to moderate acne vulgaris, in comparison to topical antibiotics such as clindamycin gel.

**Objective** To compare therapeutic efficacy in terms of reduction in lesions with topical 5% dapsone gel versus 1% Clindamycin gel in treatment of mild to moderate acne vulgaris.

**Methods** This Quasi-Experimental study was conducted in the Dermatology Department of Sahiwal Teaching Hospital, Sahiwal from March 2024 to September 2024. Patients with mild to moderate acne vulgaris meeting the Global Acne Grading Score (GAGS) of both genders and aged between 12-60 years were enrolled in the study. Patients were divided through non-probability consecutive sampling technique into two equal groups: Group A (5% dapsone gel); Group B (1% Clindamycin gel) with topical once daily application. Efficacy was assessed at baseline and at 12th week according to the GAGS. Data was analyzed using SPSS v25.0.

**Results** Among 340 patients female (78%) outnumber the male (22%) in gender distribution, with a mean age and SD of 20.82±3.817 years. Patients treated with topical 5% dapsone gel achieved 76.47% “good” efficacy compared to 73.53% of patients treated with topical 1% Clindamycin gel. Efficacy in both treatments groups was statistically significant. (P-value <0.05).

**Conclusion** Both 5% dapsone gel and 1% clindamycin gel are considered to be effective treatment options for mild to moderate acne vulgaris.

**Keywords** Acne vulgaris; Clindamycin; Dapsone; Efficacy.

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## Introduction

Acne vulgaris is a prevalent dermatological condition that primarily affects adolescents and young adults, significantly impacting self-esteem and psychological well-being, particularly in individuals with hyperpigmentation and facial scarring.<sup>1,2</sup> Studies indicate an association between acne vulgaris and increased susceptibility to depression, anxiety, and stress.<sup>3</sup> This chronic

inflammatory disorder of the pilosebaceous unit is characterized by excessive sebum production, altered keratinization, inflammatory processes, and bacterial colonization of hair follicles by *Propionibacterium acnes*.<sup>4</sup>

Globally, acne vulgaris affects approximately 9.04% of the population, ranking as the eighth most prevalent skin disease.<sup>2</sup> The condition is reported to be 1.3 times more common in women than in men, with the highest prevalence observed in the 15-19 year age group.<sup>5,6</sup> Clinically, acne presents as either non-inflammatory lesions (comedones) or inflammatory lesions, including papules, pustules, nodules, and cysts, predominantly involving the face

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The management of acne vulgaris varies based on disease severity, patient age, and lesion distribution. Mild to moderate cases are often treated with topical agents such as topical retinoids, sulfone medications, antibiotics, azelaic acid, salicylic acid, and benzoyl peroxide, with variable results.<sup>7,8</sup> Systemic retinoids are drug of choice in severe acne vulgaris.<sup>9</sup>

Various studies have been carried out for mild to moderate acne with topical drugs and demonstrated varied results. Verma *et al.* conducted a split-face study comparing 1% clindamycin gel with 5% dapson gel, reporting a 50.5% reduction in total lesion count with clindamycin and a 50.0% reduction with dapson after 12 weeks of treatment.<sup>10</sup> Although clindamycin demonstrated superior efficacy in reducing non-inflammatory lesions, dapson showed a 100% improvement on the treated side. In contrast, Brar *et al.* (2016) found that 5% dapson gel exhibited superior overall efficacy compared to 1% clindamycin gel.<sup>11</sup> The efficacy of dapson was 59.2%.

Dapson's antibacterial and anti-inflammatory properties, combined with its low systemic absorption, offer a promising alternative monotherapy for acne vulgaris.<sup>12</sup> Meanwhile, clindamycin remains a well-established antibacterial treatment aimed at reducing *P. acnes* proliferation.

The rationale behind carrying out this study was scarcity of data regarding comparison of dapson gel with clindamycin gel therapy in acne vulgaris in both national and international literature. Moreover, we wanted to compare it with international studies. This study aimed to evaluate the therapeutic effectiveness of 5% dapson gel versus 1% clindamycin gel in patients with mild to moderate acne vulgaris at a tertiary care hospital in Punjab, Pakistan. This study provided valuable insights into the comparative efficacy of these treatments within a local patient population and contributed to the broader clinical literature.

## Methods

A Quasi-Experimental study was conducted to compare the efficacy of 5% dapson gel and 1% clindamycin gel in the treatment of mild to moderate acne vulgaris. The study was carried out in the Dermatology Department of Sahiwal Teaching Hospital, Sahiwal, over six months from March 2024 to September 2024, following the approval of institutional review board and College of Physicians and Surgeons Pakistan. Sample size of 340 patients was calculated using the WHO sample size calculator, with a study power of 80% and a 95% level of significance considering an expected percentage of good percentage reduction in acne lesions of 59.2% in the dapson group and 72% in the clindamycin group based on Anjum *et al.* study.<sup>13</sup> A total of 340 patients were enrolled, with 170 patients in each group. Non-probability consecutive sampling was employed for patient selection.

Patients aged 12 to 60 years of either sex diagnosed with mild to moderate acne vulgaris according to the Global Acne Grading Score (GAGS) were enrolled after obtaining written informed consent. Patients with severe acne vulgaris (Grade 3/4), pregnant and breast feeding, known hypersensitive to dapson or clindamycin, and having any history of previous systemic acne treatments, disease duration exceeding 3 months or presence of secondary skin infections were excluded from study.

Global acne grading system score was determined by adding an individual local score, and the severity of acne vulgaris was based on overall score as follows: *Mild*: score ranging from 1-18, *Moderate*: score ranging from 19-30, *Severe*: score ranging from 31-38, *very severe*: score >39.<sup>13</sup> Mild to moderate acne vulgaris patient according to GAGS score were enrolled, and treatment efficacy was categorized as follows: *Excellent grade* when there was reduction of lesions >75%, *Good grade* when percentage reduction in lesions was between 50-74%, *Fair* when reduction was between 25-49% and *Poor grade* when percentage reduction was <25%.

A detailed medical history was recorded, and relevant investigations were conducted. Participants were assigned to Group A (dapsons gel 5%) or Group B (clindamycin gel 1%). The total number of acne lesions, including papules, pustules, and comedones, was documented at baseline and subsequently reassessed at 4, 8, and 12 weeks with topical once daily application. Percentage reduction in lesion count was calculated at the end of the treatment period. If no response to treatment was observed by the 8th week, therapy was discontinued. Fortunately, there was no patient whose therapy was discontinued

Data were analyzed using SPSS version 23. Qualitative variables, including gender and efficacy, were presented as frequency and percentage. Quantitative variables, such as age, number of each type of acne lesion, and percentage reduction in acne lesions, were expressed as mean and standard deviation. Efficacy was defined in terms of reduction in acne lesions and was categorized into excellent, good and poor response, calculated after 12 weeks in both groups. A chi-square test was applied to compare the two groups, with a p-value of less than 0.05 considered statistically significant. The outcome data were stratified by age and gender, and a post-stratification chi-square test was performed to assess their effects on treatment outcomes.

**Result**

Among 340 study participants, the majority (85%; n=289) patients belonged to 16-30 years of age group and female gender (78%; n=264) predominates among study participants. More than

**Table 1** Demographic and clinical variables.

Group	Frequency	Mean ± SD	P value
<b>Age</b>			
<16 years	20	13.45±2.645	0.771
16-30 years	289	20.82±3.817	
>30 years	32	39.61±7.437	
<b>Gender</b>			
Male	75	-	-
Female	264	-	-
<b>Severity of Disease</b>			
Mild	79	-	-
Moderate	261	-	-

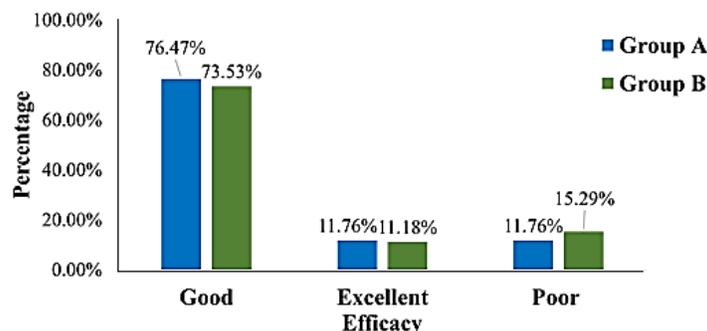
two third of study patients, (77%; n=261) had moderate severity and (23%; n=79) had mild acne vulgaris as per Global Acne Grading (**Table 1**).

After 12 weeks of treatment, good response of efficacy in Group A (dapsons) was observed in 76.47% and Group B (clindamycin) 73.53% respectively. On the other hand, excellent response was almost equally demonstrated in both groups in Group A (11.76%) and Group B (11.18%) respectively.

Efficacy of both treatment groups was statistically significant, showing P-value <0.05, as shown in **Table 2**.

**Discussion**

Acne vulgaris is a common, chronic inflammatory condition of pilosebaceous unit, leading to scarring and post inflammatory hyperpigmentation. Early treatment of acne vulgaris helps in minimizing scarring and hyperpigmentation which have got significant psychological effects in an individual.



**Figure1** Comparison of efficacy between Group A and Group B

**Table 2** Comparative analysis of patients, efficacy and P-value among Group A and Group B.

	Number of patients		Percentage (%) reduction		P Value	
	Group A	Group B	Group A	Group B	Group A	Group B
Good	130	125	76.47	73.53	0.037	0.039
Excellent	20	19	11.76	11.18	0.037	0.039
Poor	20	26	11.76	15.29	0.037	0.039
Total	170	170	100	100	<0.05	<0.05



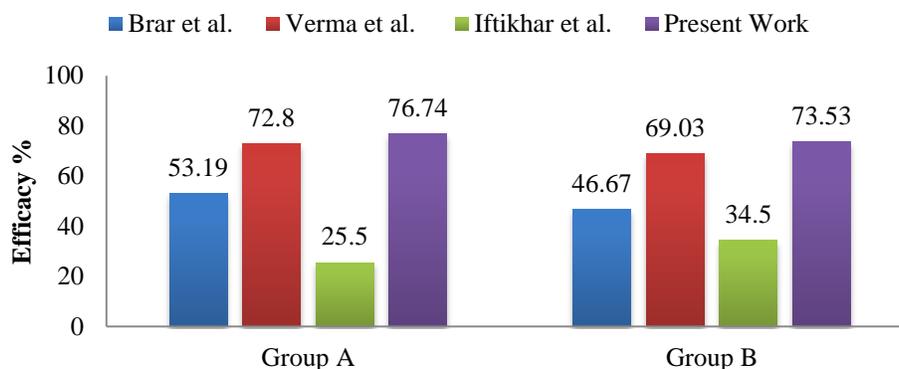
**Figure 2** A visual comparison of the results of both groups before and after treatment.

This could be achieved through early treatment of mild to moderate severity of acne vulgaris. At times, acne is a challenging task for dermatologists. In such cases multiple treatment options have been introduced. In our study 5% dapsone and 1% clindamycin have been used in mild to moderate acne vulgaris. Acne vulgaris was observed mostly in second and third decade of life.<sup>11,14,15</sup> In present study, acne vulgaris predominately involved 16-30 years (85%) of age group and these findings were consistent with Brar *et al.* who observed 76% (n=46) patients in 14-24 years of age group.<sup>11</sup> The participants in current study were predominately female gender 78% (n=264) that was comparable with Brar *et al.* showed 55% (n=33) of female gender.<sup>11</sup> In contrast, Verma *et al.* had demonstrated male predominance 60% (n=24) as compared to female gender.<sup>10</sup> In this study, more than two third of participants 77% (n=261) had moderate acne vulgaris while mild severity of acne vulgaris was

observed in 23% (n=79). While Brar *et al.* observed 51% (n=31) of moderate acne vulgaris and 49% (n=29) of mild acne vulgaris.<sup>11</sup> Muhammadi *et al.* demonstrated in his study that majority of patients 73% (n=73) of acne vulgaris were of mild severity as compare to moderate severity 27% (n=27).<sup>16</sup> Similarly, Sabaa *et al.* observed that 60% (n=09) of patients were of mild acne vulgaris and 40% (n=06) having moderate acne vulgaris.<sup>17</sup>

In current study, efficacy rate in both treatment modalities (dapsone and clindamycin) was reported to be higher (76.47% and 73.53% respectively). In contrast, Brar *et al.* efficacy rate in terms of good reduction was low (53.19% and 46.67% respectively) as compared to current study.<sup>11</sup> In present study, efficacy of dapsone vs. clindamycin phosphate was statistically significant as showed by p-value of 0.037 with dapsone and 0.039 with clindamycin. In this study better efficacy of dapsone as compared to clindamycin may be attributed to its antimicrobial and anti-inflammatory effect on skin. While clindamycin is primarily topical antimicrobial which may be having less effects against inflammatory lesions of acne vulgaris.

In contrast, good response of efficacy of dapsone 5% was less (25.5%) as compare to clindamycin phosphate 3(4.5%) in the study conducted by Iftikhar *et al.*<sup>14</sup> Similarly, Iqra *et al.* in her study reported promising results with 1% clindamycin as compared to 5% dapsone gel as results were 84.4% and 15.6% respectively.<sup>19</sup> In the study carried out by Verma *et al.*; it was observed that 5% dapsone gel was found to be slightly more effective in reducing the non-inflammatory and inflammatory lesions. It showed 72.8% improvement with dapsone 5% gel as compared to 69.03% with 1% clindamycin gel at the end of 12 weeks which was comparable with previous studies.<sup>10</sup>



**Figure 3** Comparison of good response of efficacy in group A and group B therapies of acne vulgaris with previous studies.

Sanawar *et al.* demonstrated statistically significant good response of efficacy with both topical treatment modalities which showed concordance with the present study results. Although results showed greater response of efficacy with dapson gel (90%) as compared to our study subjects (76.47%). While good response of efficacy of 1% clindamycin phosphate gel was markedly raised (73.53%) in our study as compared to Sanawar *et al.* (16.7%).<sup>18</sup>

Likewise, good response of dapson gel and clindamycin gel has been demonstrated as monotherapy in acne vulgaris in the studies carried out previously. A study conducted by Majeed *et al.* reported 59.2% efficacy with 5% dapson gel in mild to moderate acne vulgaris<sup>15</sup> and these findings were of low frequency as compared to our study results. Sabaa *et al.* obtained statistically significant results ( $p=0.001$ ) while using 5% dapson gel as compared to present study ( $p=0.037$ ).<sup>17</sup> Likewise, Yasir *et al.* observed significant results ( $p=0.001$ ) with 5% dapson gel in patients with acne vulgaris.<sup>21</sup> A study carried out by Muhammadi *et al.* showed 30.76% good efficacy with 1% clindamycin phosphate.<sup>16</sup> Haq *et al.* observed low response of efficacy (33.8%) with 1% clindamycin gel in mild to moderate acne vulgaris. These findings were close to current study findings related to efficacy with clindamycin gel.<sup>20</sup> While Hapsari *et al.* demonstrated statistically significant result with 1% clindamycin phosphate gel obtained ( $p= 0.0000$ ) and showed better efficacy than our study results ( $p=0.039$ ).<sup>22</sup>

Despite the promising findings, this study has several limitations. The duration of follow-up was limited to 12 weeks, which may not fully capture long-term treatment efficacy or potential recurrence rates. Additionally, the study was conducted in a single-center setting, potentially limiting the generalizability of the findings to broader populations. Future studies with longer follow-up durations, larger sample sizes, and multi-center designs are recommended to further validate these results.

This article emphasises the better treatment modalities in achieving the superior efficacy in mild to moderate acne vulgaris with relatively new alternative option of topical dapson gel. Given the increasing concern over antibiotic resistance associated with topical antibiotics, dapson may serve as a valuable non-antibiotic topical therapeutic option for acne management. However, individual patient factors such as skin sensitivity, treatment adherence, and potential adverse effects should be considered when selecting the most appropriate therapy.

## Conclusion

Both 5% dapson gel and 1% clindamycin gel are considered to be effective treatment options for mild to moderate acne vulgaris.

**Ethical approval** The study was approved by Institutional Review Board (IRB) Sahiwal Medical College/ Sahiwal Teaching Hospital vide letter No. 117/IRB/SLMC/SWL dated 08.06.2022.

**Declaration of patient consent** Authors certify that they have obtained all appropriate patient consent.

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**Conflict of interest** Authors declared no conflict of interest.

#### **Author's contribution**

**AM:** Conception and design of study, acquisition, analysis and interpretation of data. Maintaining accuracy or integrity of parts of study, has given final approval of the version to be published.

**ZR:** Design of study, acquisition and interpretation of data, maintaining accuracy or integrity of parts of the study, has given final approval of the version to be published.

**HK,SH:** Conception of study, acquisition of data, maintaining accuracy or integrity of parts of the study, has given final approval of the version to be published.

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