

Original research article

**TO COMPARE OF ORAL CLINDAMYCIN AND
DOXYCYCLINE FOR THE TREATMENT OF ACNE
VULGARIS: EFFICACY AND SAFETY**

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Abstract

Introduction: Acne vulgaris causes chronic inflammation in the pilosebaceous units. This is a common dermatological problem that often begins at puberty and last throughout adolescence, affecting both male and female teenagers equally. The objective of this study is to assess the efficacy of oral clindamycin in comparison to doxycyclin for the treatment of moderate to severe acne vulgaris. Oral clindamycin is a safer alternative to doxycyclin for treating moderate to severe acne vulgaris.

Material and Methods: This study was designed as a prospective, randomized controlled trial with single-blind methodology. The Outpatient Section of the Department of Pharmacology is located at the Madha Medical College and Research Institute, Chennai, Tamil Nadu, India. The study was conducted from November 2017 to October 2018.

Results: In a few of instances, Nausea, Vomiting, and Diarrhoea were of little clinical significance and spontaneously resolved. The patients revealed the incidence of these effects only when specifically asked about their presence. Had the symptoms of diarrhoea and abdominal pain been severe, persons would have undoubtedly informed the investigator. Nevertheless, there were no reports of anyone encountering such symptoms. And all of them continued to take the drug without stopping. It is crucial to note that if Nausea and Vomiting were a result of Pseudomembranous enterocolitis, the symptoms would have exacerbated with ongoing intake.

Conclusion: The study suggests the use of oral Clindamycin at modest dosages as a treatment for acne vulgaris. Subsequent trials have the potential to integrate Clindamycin with other topical medications such as Tretinoin and Adapalene, which operate in distinct ways.

Keywords: Clindamycin, doxycycline, safety, efficacy and acne vulgaris

Introduction

The pilosebaceous units are chronically inflamed in acne vulgaris. It is a prevalent skin condition that starts in puberty and continues until adolescence, impacting teenage boys and girls equally. The development of horny plugs that block hair follicles is a common cause. This leads to inflammation surrounding the hair follicles, which in turn causes tissue death and scar formation. This issue is prevalent on a global scale and impacts individuals from all walks of life. The affected age group is becoming more conscious of acne as a result of improved living conditions, which is leading to psychological concerns as well ^[1, 2].

Traditional medicine practitioners from all over the world, including those trained in Ayurveda, Siddha, and Unani, as well as indigenous healers, have long relied on a variety of therapies. So far, there is no published scientific evidence of improvement. Contemporary medicine now offers a range of medications that have proven effective in managing this condition. In one way or another, they've all been valuable ^[3, 4].

The majority of medications, including tetracycline, have been applied topically, while others have an oral dosage. Scarring and ugliness are the physical manifestations of this disorder, which causes emotional and mental anguish in affected children. The following chapters detail the study's findings, which sought to assess the effectiveness of a low-dose oral Clindamycin in treating acne vulgaris ^[5, 6].

Medications are now used topically in the form of lotions, gels, and creams containing alcohol. Antimicrobials and comedolytics are the medications that are applied topically. Medications that kill microbes are used orally. Tetracycline, Minocycline, Erythromycin, and Doxycycline are the oral antimicrobials. Adverse effects are more common with these oral antibiotics because they should be taken for longer than two months. Oral tetracycline use exceeding two months is associated with an increased incidence of cerebral hypertension ^[7, 8].

Other typical side events include super infection, liver and kidney damage, and other skin responses. Lincosamide antibiotic clindamycin binds to the 50s ribosome and blocks protein synthesis. The addition of chloride to lincomycin makes this semisynthetic antibiotic what it is today. It stands out due to its potent action against several anaerobes. Anaerobic infections often require a dosage of 150-300 mg taken orally four times daily. Clindamycin, when applied topically, is highly successful in treating acne vulgaris ^[8].

Due to the fact that clostridium difficile induces pseudomembranous enterocolitis at doses of 150–300 mgs administered four times day, the effectiveness of oral clindamycin has not been tested. The propionibacterium acne that has been discovered to colonise the acne lesions is effectively killed by this clindamycin. Clindamycin has shown promising results when applied topically. As a result, researchers decided to test the efficacy of oral clindamycin at a low dose on acne vulgaris. The positive effects have been examined at this low level without the risk of pseudomembranous colitis and other probable side effects ^[9, 10].

The purpose of this research is to compare the effectiveness of oral clindamycin with doxycyclin in treating moderate to severe acne vulgaris. Compared to doxycyclin, oral clindamycin is safer for moderate to severe acne vulgaris.

Materials and Methods

This study was designed as a prospective, randomized controlled trial with single-blind methodology. The Outpatient Section of the Department of Pharmacology is located at the Madha Medical College and Research Institute, Chennai, Tamil Nadu, India. The study was conducted from November 2017 to October 2018.

Study Design

The Study commenced subsequent to obtaining approval from the institutional ethical committee. Patients were included in the study only after getting their informed written consent. For patients under the age of 18, parental consent was also acquired.

Inclusion Criteria

- Informed consent in writing.
- Not receiving medication for acne vulgaris.
- Not having a systemic condition.

Exclusion Criteria

- Born under 15 and older than 25 years old.
- Severe acne vulgaris.
- Unwilling to provide written, informed permission.
- Having a history of antibiotic hypersensitivity.

Results

Here are the findings and analysis of the study that compared the safety and effectiveness of oral Doxycycline with that of 50 mg of Clindamycin given once daily for four weeks. The goal of using a 5% benzoyl peroxide cream topically is to compare the efficacy of the two treatments and see whether the combination yields better results. The mathematical mean of the number of comedons dropped from 4.40 at the beginning of the study (i.e., before medication administration) to 3.06 at the conclusion of the sixth week when 30 patients took oral Doxycycline for four weeks.

Table 1: Comedon count for each patient in trial I's group A

| Sr. No. | Visit 0 | Visit 1 | Visit 2 | Visit 3 |
|---------|---------|---------|---------|---------|
| 1 | 5 | 4 | 4 | 4 |
| 2 | 5 | 3 | 3 | 4 |
| 3 | 4 | 3 | 3 | 4 |
| 4 | 5 | 4 | 4 | 3 |
| 5 | 4 | 3 | 3 | 4 |
| 6 | 4 | 3 | 3 | 4 |
| 7 | 4 | 5 | 4 | 2 |
| 8 | 4 | 5 | 3 | 4 |
| 9 | 5 | 4 | 3 | 4 |
| 10 | 4 | 4 | 4 | 4 |
| 11 | 5 | 3 | 4 | 2 |

| | | | | |
|----|---|---|---|---|
| 12 | 4 | 3 | 4 | 3 |
| 13 | 4 | 5 | 5 | 3 |
| 14 | 3 | 5 | 4 | 5 |
| 15 | 5 | 4 | 3 | 3 |
| 16 | 5 | 4 | 4 | 3 |
| 17 | 5 | 5 | 4 | 4 |
| 18 | 5 | 5 | 5 | 4 |
| 19 | 4 | 4 | 4 | 3 |
| 20 | 5 | 3 | 4 | 4 |

In the group that received clindamycin, the mean number of comedons decreased from 4.33 on the "0" visit, which is before the antibiotic was provided, to 2.83 after 6 weeks of drug therapy.

Table 2: Comedon count for each patient in trial I's group B

| Sr. No. | Visit 0 | Visit 1 | Visit 2 | Visit 3 |
|---------|---------|---------|---------|---------|
| 1 | 4 | 3 | 4 | 4 |
| 2 | 5 | 3 | 5 | 4 |
| 3 | 4 | 5 | 3 | 3 |
| 4 | 4 | 1 | 4 | 3 |
| 5 | 4 | 1 | 4 | 1 |
| 6 | 3 | 4 | 3 | 4 |
| 7 | 5 | 3 | 4 | 4 |
| 8 | 5 | 3 | 4 | 3 |
| 9 | 5 | 5 | 4 | 1 |
| 10 | 5 | 1 | 1 | 3 |
| 11 | 4 | 2 | 4 | 5 |
| 12 | 5 | 4 | 4 | 3 |
| 13 | 4 | 5 | 1 | 1 |
| 14 | 3 | 5 | 4 | 4 |
| 15 | 5 | 4 | 3 | 3 |
| 16 | 5 | 3 | 2 | 2 |
| 17 | 4 | 2 | 1 | 2 |
| 18 | 4 | 5 | 3 | 3 |
| 19 | 5 | 4 | 4 | 3 |
| 20 | 5 | 3 | 3 | 4 |

The mathematical mean of the number of papules in 30 patients in the Doxycycline-administered group decreased from 3.30 on the "0" visit, before drug administration, to 2.2 at the end of the sixth week.

Table 3: Number of papules found in trial I's group A patients

| Sr. No. | Visit 0 | Visit 1 | Visit 2 | Visit 3 |
|---------|---------|---------|---------|---------|
| 1 | 4 | 2 | 2 | 3 |
| 2 | 4 | 3 | 1 | 2 |
| 3 | 3 | 3 | 2 | 3 |
| 4 | 4 | 2 | 1 | 3 |
| 5 | 3 | 2 | 2 | 2 |
| 6 | 4 | 3 | 3 | 3 |
| 7 | 2 | 3 | 2 | 2 |
| 8 | 3 | 2 | 3 | 1 |
| 9 | 4 | 4 | 3 | 2 |
| 10 | 2 | 2 | 3 | 1 |
| 11 | 3 | 3 | 2 | 2 |
| 12 | 4 | 3 | 4 | 3 |
| 13 | 3 | 4 | 2 | 3 |
| 14 | 3 | 2 | 4 | 1 |
| 15 | 4 | 3 | 3 | 2 |
| 16 | 4 | 2 | 2 | 3 |
| 17 | 3 | 3 | 4 | 2 |
| 18 | 4 | 3 | 3 | 3 |
| 19 | 2 | 2 | 1 | 3 |
| 20 | 3 | 3 | 2 | 3 |

In the group that received clindamycin, the average number of papules in 30 patients on the first visit (before medication delivery) was 3.36, but by the conclusion of the sixth appointment, it had dropped dramatically to 1.9.

Table 4: Count of papules in the first trial's B group of patients

| Sr. No. | Visit 0 | Visit 1 | Visit 2 | Visit 3 |
|---------|---------|---------|---------|---------|
| 1 | 2 | 3 | 1 | 2 |
| 2 | 3 | 2 | 2 | 3 |
| 3 | 4 | 4 | 2 | 1 |
| 4 | 2 | 2 | 3 | 2 |
| 5 | 3 | 3 | 2 | 3 |
| 6 | 4 | 3 | 2 | 1 |
| 7 | 3 | 1 | 2 | 2 |
| 8 | 3 | 2 | 2 | 2 |
| 9 | 4 | 3 | 2 | 3 |
| 10 | 4 | 2 | 3 | 1 |
| 11 | 3 | 1 | 2 | 2 |
| 12 | 4 | 3 | 2 | 2 |
| 13 | 4 | 2 | 3 | 1 |
| 14 | 3 | 3 | 1 | 2 |

| | | | | |
|----|---|---|---|---|
| 15 | 4 | 1 | 2 | 2 |
| 16 | 4 | 3 | 2 | 2 |
| 17 | 3 | 2 | 2 | 1 |
| 18 | 4 | 3 | 2 | 2 |
| 19 | 4 | 3 | 3 | 2 |
| 20 | 3 | 2 | 2 | 3 |

Discussion

The study aims to determine the effectiveness of a 50 mg oral dose of Clindamycin while simultaneously assessing if this effectiveness is achieved without causing the undesirable effects that make the administration of Clindamycin uncertain. The most severe consequence is pseudomembranous enterocolitis. Clindamycin exhibits a highly favourable impact on acne vulgaris, which will be further elaborated upon. These effects are generated without any notable detrimental consequences [11, 12].

In a small number of cases, Nausea, Vomiting, and Diarrhoea were clinically unimportant and resolved on their own. The patients disclosed the occurrence of these effects solely in response to targeted inquiries regarding their presence. If the symptoms of diarrhoea and abdominal pain had been severe, individuals would have certainly notified the investigator. However, no one reported experiencing such symptoms. And all of them persisted in consuming the medication without cessation. It is important to mention that if Nausea and Vomiting were caused by Pseudomembranous enterocolitis, the symptoms would have worsened with continuing consumption [13, 14].

However, the symptoms resolved on their own. Only three individuals were administered the medication Metronidazole by their personal physician to treat their cases of Dysentery. Upon analysing the effectiveness of oral Clindamycin, it has been observed that a daily administration of a low dose of 50 mg for four weeks has yielded superior outcomes compared to a single daily dose of Doxycycline over the same duration [15, 16].

In mild cases of acne vulgaris, patients who got only oral Clindamycin experienced a notable decrease in the number of Comedons and papules compared to the group that received only oral Doxycycline. This is apparent in both the clinical data reported in the results column and its statistical significance. Even in moderate cases, a notable improvement is observed in the group receiving oral Clindamycin treatment. The Clindamycin treated group exhibited a decrease in the number of Comedons, papules, and pustules compared to the Doxycycline treated control group. The involvement of Propionibacterium acne in the development of acne has already been examined [17-19].

The antimicrobial agents, Cap. Doxycycline and Cap. Clindamycin, exert their action on Propionibacterium acne in the treatment of acne vulgaris. These antibiotics reduce the number of Propionibacterium acne bacteria, which then inhibits the activity of bacterial lipases and results in a decrease in the quantity of free fatty acids. This results in reduced tissue irritation and acne [18, 19].

The experimental groups investigated the outcome of combining oral medication therapy with topically administered Benzoyl peroxide, which is commonly used in acne therapy. The combination of oral Clindamycin and topical Benzoyl peroxide resulted in a higher level of effectiveness. Doxycycline, whether taken alone or in conjunction

with Benzoyl peroxide, has maintained its effectiveness. However, its effectiveness is enhanced when used in combination with topical Benzoyl peroxide ^[20,21].

Clindamycin, whether used alone or in conjunction with a 5% cream containing Benzoyl peroxide, demonstrates superior effectiveness compared to Doxycycline, whether used alone or in conjunction with a 5% cream containing Benzoyl peroxide. The reduced effectiveness of Doxycycline may be attributed to the emergence of resistance in *Propionibacterium acne* among certain patients enrolled in this study ^[22, 23].

According to the research, there is a global rise in the antibiotic resistance of *Propionibacterium acne*. Clindamycin, although being an antimicrobial agent, has superior effectiveness in this investigation. This may be due to the lack of previous utilisation of Clindamycin oral therapy for acne vulgaris, potentially resulting in the absence of bacterial resistance. The superior outcomes observed in the group treated with topical Benzoyl peroxide can be attributed to its antibacterial and direct anti-inflammatory properties ^[23-25].

Conclusion

Findings show that acne vulgaris responds well to a low-dose oral formulation of Clindamycin (50 mg once daily for four weeks). Without any unwelcome side effects, the desired outcomes are achieved. Adverse effects abound when 150-300 mg are administered three to four times daily for numerous illnesses. In this study, the 50 mg dose was found to be both very effective and safe, with no notable side effects. Clinical trials of Clindamycin for acne vulgaris have exclusively used topical applications thus far. In cases of acne vulgaris, this study supports the use of oral Clindamycin at modest doses. It is possible to conduct future trials combining Clindamycin with other topical medicines, such as Tretinoin and Adapalene, which operate through distinct mechanisms. Tretinoin can undo the acne vulgaris-related aberrant keratinizing alterations. Among its comedolytic properties is adapalene. Similar trials will encourage the widespread use of oral Clindamycin in the treatment of acne vulgaris, and this one was carried out as a single centre trial. In addition to demonstrating the safety and effectiveness of low-dose oral Clindamycin in treating acne vulgaris, this study opens the door to the possibility of using this same low-dose regimen for other infections in which the bacterium causes the condition.

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