ORIGINAL RESEARCH PAPER
Volume - 13 | Issue - 12 | December - 2024 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

PROSPECTIVE COMPARATIVE CLINICAL TRIAL TO COMPARE THE EFFICACY AND SAFETY OF TOPICAL CLINDAMYCIN AND TOPICAL NADIFLOXACIN IN TREATMENT OF ACNE VULGARIS WITH EACH OTHER

Clinical Research

Dr. Monika Sahu* Assistant Professor, Department of Pharmacology CIMS, Bilaspur. *Corresponding Author

Dr. Prasenjit Raut Professor, Department of Pharmacology, Shree Balaji Institute of Medical Sciences, Raipur, Chhattisgarh

Dr Atul Mohankar Professor, Department of Dermatology, Venereology and Leprosy Shree Balaji Institute of Medical Sciences, Raipur, Chhattisgarh

Dr. Ashish Sharma Demonstrator, Department of Pharmacology CIMS, Bilaspur.

ABSTRACT

Background Acne vulgaris is a common dermatological disorder of the pilosebaceous unit presenting usually at puberty. It is characterized by the formation of open and closed comedones (non-inflammatory lesions), papules, pustules, and nodulocystic lesions (inflammatory lesions) generally affecting the face, arms, and back. The pathogenesis is complex and multifactorial which includes abnormal sebum production, follicular hyperkeratinization, bacterial proliferation and inflammation. Acne vulgaris has a prolonged course with acute or insidious relapses and recurrences. Clinically inflammatory and non- inflammatory lesions may occur. **Objective** To compare the efficacy and safety of topical Clindamycin and topical Nadifloxacin in treatment of acne vulgaris. **Method:** The present study of 100 patients is Single blind randomized open prospective comparative clinical trial undertaken to compare the efficacy and safety of topical clindamycin and topical nadifloxacin in treatment of acne vulgaris with each other. The study period was from November 2021 to October 2022 conducted at Dept. of Pharmacology, CIMS Bilaspur CG **Result:** The mean age in group Clindamycin was 23.67 years and group Nadifloxacin was 24.74 years. There were 21 (42%) and 30 (60%) male patients among Group Clindamycin and Group Nadifloxacin respectively. There was no gender difference when two groups were compared statistically (p>.05). Most of the patients were students i.e. 40% each in among Group Clindamycin and Group Nadifloxacin respectively. The mean duration of symptom in group Clindamycin was 10.9 ±7.58 months and group Nadifloxacin was 13.84 ±7.58 months. The most common precipitating factor was stress, there were 16 (32%) and 13 (26%) patients among Group Clindamycin and Group Nadifloxacin respectively with stress. The mean of lesions count at baseline in group Clindamycin was 10.74 ±2.33 and group Nadifloxacin was 10.76 ±2.86. The mean of lesions count at 8 weeks in group Clindamycin was 6.98 ±1.95 and group Nadifloxacin was 6.78 ±1.98. The mean of lesions counts at 12 weeks in group Clindamycin was 2.54 ±1.70 and group Nadifloxacin was 1.80 ±1.42. The mean percent reduction in lesions counts at 12 weeks in group Clindamycin was 41.08 ±29.54 and group Nadifloxacin was 33.98 ±31.91%. **Conclusion:** The present study concludes that both topical antibiotics Clindamycin and Nadifloxacin are equally effective in treating mild to moderate acne vulgaris. This study has shown that Nadifloxacin is as effective as clindamycin in the treatment of mild to moderate acne vulgaris. In view of the development of antibiotic resistance by Propionibacterium species, Nadifloxacin will be a better alternative for the treatment of acne vulgaris.

KEYWORDS

Acne vulgaris, Topical, Clindamycin, Nadifloxacin

INTRODUCTION

Acne vulgaris is a common dermatological disorder of the pilosebaceous unit presenting usually at puberty.[1] It is characterized by the formation of open and closed comedones (non-inflammatory lesions), papules, pustules, and nodulocystic lesions (inflammatory lesions) generally affecting the face, arms, and back. The pathogenesis is complex and multifactorial which includes abnormal sebum production, follicular hyperkeratinization, bacterial proliferation and inflammation. [2] Acne vulgaris has a prolonged course with acute or insidious relapses and recurrences. Clinically inflammatory and non-inflammatory lesions may occur. There can be discomfort occurs due to inflammatory lesions and seborrhea of varying degree. [3] Although the course of acne may be self-limiting, the sequelae can be lifelong, with pitted or hypertrophic scar formation. The peak incidence is between 14-17 years in women and 16–19 years in men.[4]It seems to be familial but owing to the high prevalence of the disease this has been extremely difficult to assess. Increased sebum secretion is associated with the development of acne lesions, since sebum serves as a nutrient source for the Gram-positive bacterium Propionibacterium acnes (P.acnes), a member of the normal skin flora. Microbiological colonization of the sebaceous gland has been identified as a major factor in disrupting the follicular epithelium, in which P. acnes produce enzymes such as lipases, proteases, and hyaluronidases leading to subsequent inflammatory reactions in the surrounding dermis. Systemic therapy with antibacterials, retinoids and hormones are mainly indicated for severe cases. [5]

Topical clindamycin has been found to be as effective as systemic tetracycline, topical erythromycin and topical benzoyl peroxide. Clindamycin is bactericidal to Propionibacterium, acnes. Clindamycin phosphate applied topically penetrates to a very great extent in to open comedones and thus produces a high percentage of sterile comedones. [6,7]Topical fluoroquinolone antibiotic, nadifloxacin, is a relatively new member of the family of anti-acne medications. It has been used for the therapy of mild to moderate acne in Japan and other European countries and has also been recently launched in India. This antimicrobial agent is effective against aerobic and anaerobic bacteria isolated from patients with infective skin disorders.[8] Several in-vitro studies have documented the antibacterial activity of nadifloxacin against Propionibacterium acnes, an important bacterial pathogen in acne. [9] Additionally, studies also suggest that the effectiveness of nadifloxacin in inflammatory acne lesions may be attributed to its inhibitory effect on pro-inflammatory cytokines like interleukin (IL)-1α, IL-6, and IL-8 which also play an important role in acne pathogenesis.[10]

Objective

The present single blind randomized open prospective comparative clinical trial is undertaken to compare the efficacy and safety of topical Clindamycin and topical Nadifloxacin in treatment of acne vulgaris.

MATERIALAND METHODS

The present study of 100 patients is Single blind randomized open prospective comparative clinical trial undertaken to compare the efficacy and safety of topical clindamycin and topical nadifloxacin in treatment of acne vulgaris with each other. The study period was from November 2021 to October 2022 conducted at Dept. of Pharmacology, CIMS Bilaspur CG. The study was approved by the Ethical Committee of the Medical College.

Patient Inclusion Criteria

- All patients' between 15 and 35 years having ≥2 and ≤30 inflammatory and/or non inflammatory lesions of acne vulgaris.
- Patients of either sex with mild to moderate acne vulgaris

Patient Exclusion Criteria

- Pregnant and Lactating Women
- Drug induced Acneform eruptions.
- Drug allergy
- Children less than 12 years

Methodology

- A total of 100 patients between 15 and 35 years having ≥2 and ≤30 inflammatory and/or noninflammatory lesions with Investigator's Global Assessment (IGA) score 2/3 were randomly divided into 2 groups.
- The efficacy parameters were changes in the total, inflammatory and non-inflammatory lesion counts, Investigator Global Assessment (IGA) from baseline to study end.
- All treatment emergent dermatological adverse events were evaluated for safety assessment.
- Number of inflammatory and noninflammatory lesion was counted
- The 100 patients who fulfilled the inclusion criterias were selected randomly and assigned into two groups.

  Ist Group – Clindamycin 1% gel
  IInd Group – Nadifloxacin 1% gel

Records of OPD prescription was taken from commencement of therapy.

Patients were instructed to review for every four weeks and report the severe side effects, if any, immediately.

RESULTS

Age

The below table shows distribution according to patient's age among two groups. The mean age in group Clindamycin was 23.67 years and group Nadifloxacin was 24.74 years. There was no significant difference in age distribution in two groups,(p>0.05). (P<0.05 Statistically Not Significant)

Table 1 Distribution According To Patient's Age Among Two Groups:

Age Group	Group–I (Clindamycin 1%)	Group – II (Nadifloxacin 1%)	Total	P value
≤20	18 (36%)	15 (30%)	33	>0.05 (NS)
21-25	14 (28%)	08 (16%)	22	
26-30	12 (24%)	14 (28%)	26	
31-35	06 (12%)	13 (26%)	19	
Total	50 (100%)	50 (100%)	100	
Mean age (years)	23.67	24.74	P=0.56 (NS)	

Gender

The below table shows distribution according to patient's gender among two groups. Out of total 100 patients, there were 21 (42%) and 30 (60%) male patients among Group Clindamycin and Group Nadifloxacin respectively. There was no gender difference when two groups were compared statistically. (p>0.05)

Table 2 Distribution According To Gender Among Two Groups:

Gender	Group–I (Clindamycin 1%)	Group – II (Nadifloxacin 1%)	P value
Male	21 (42%)	30 (60%)	>0.05 (NS)
Female	29 (58%)	20 (40%)	
Total	50 (100%)	50 (100%)	

Occupation

The below table shows distribution according to patient's occupation among two groups. Out of total 100 patients, most of the patients were students i.e. 40% each in among Group Clindamycin and Group Nadifloxacin respectively. There was no occupation difference when two groups were compared statistically. (p>.05)

Table 3 Distribution According To Occupation Among Two Groups:

Occupation	Group–I (Clindamycin 1%)	Group – II (Nadifloxacin 1%)	P value
Housewife	13 (26%)	05 (10%)	>0.05 (NS)
Student	20 (40%)	20 (40%)	
Unemployed	05 (10%)	07 (14%)	
Other	12 (24%)	18 (36%)	
Total	50 (100%)	50 (100%)	

Duration Of Symptoms

The table shows distribution according to duration of symptoms among two groups. The mean duration of symptom in group Clindamycin was 10.9 ±7.58 months and group Nadifloxacin was 13.84 ±7.58 months. There was no significant difference in duration of symptoms distribution in two groups. (p>0.05)

Table 4 Distribution According To Duration Of Symptoms Among Two Groups:

Duration (months)	Group–I (Clindamycin 1%)	Group – II (Nadifloxacin 1%)	P value
Mean duration	10.9 ±7.58	13.84 ±7.58	0.18 (NS)

Precipitating Factor

The table shows distribution according to patient's gender among two groups. Out of total 100 patients, most common precepting factor was stress, there were 16 (32%) and 13 (26%) patients among Group Clindamycin and Group Nadifloxacin respectively with stress. The next common precepting factor was smoking (14% and 24%) among Group Clindamycin and Group Nadifloxacin respectively.

Table 5 Distribution According To Precipitating Factor Among Two Groups:

Precipitating Factor	Group–I (Clindamycin 1%)	Group – II (Nadifloxacin 1%)	P value
Smoking	07 (14%)	12 (24%)	>0.05 (NS)
Stress	16 (32%)	13 (26%)	>0.05 (NS)
Summer	02 (04%)	02 (04%)	>0.05 (NS)
ALC	02 (04%)	00 (00)	>0.05 (NS)
PMF	02 (04%)	02 (04%)	>0.05 (NS)

Distribution According To Response

The mean of lesions count at baseline in group Clindamycin was 10.74 ±2.33 and group Nadifloxacin was 10.76 ±2.86. There was no significant difference in lesion count distribution in two groups at baseline. (p>0.05)

The mean of lesions count at 8 weeks in group Clindamycin was 6.98 ±1.95 and group Nadifloxacin was 6.78 ±1.98. There was no significant difference in lesion count distribution in two groups. (p>0.05)

The mean of lesions counts at 12 weeks in group Clindamycin was 2.54 ±1.70 and group Nadifloxacin was 1.80 ±1.42. There was no significant difference in lesion count distribution in two groups. (p>0.05)

Table 6 Distribution According To Response Among Two Groups:

Follow up	Group–I (Clindamycin 1%) Mean lesions	Group – II (Nadifloxacin 1%) Mean lesions	P value
Baseline	10.74 ±2.33	10.76 ±2.86	0.43 (NS)
Follow up 8 weeks	6.98 ±1.95	6.78 ±1.98	0.18 (NS)
Follow up 12 weeks	2.54 ±1.70	1.80 ±1.42	0.09 (NS)

Distribution According To Reduction Of Lesions

The mean percent reduction in lesions counts at 12 weeks in group Clindamycin was 41.08 ±29.54 and group Nadifloxacin was 33.98 ±31.91%. There was no significant difference in mean percent reduction in lesions distribution in two groups. (p>0.05)

Table 7 Distribution According To % Reduction Among Two Groups:

Reduction	Group–I (Clindamycin 1%)	Group – II (Nadifloxacin 1%)	P value
Mean percentage reduction of lesions	41.08 ±29.54	33.98 ±31.91	0.13 (NS)

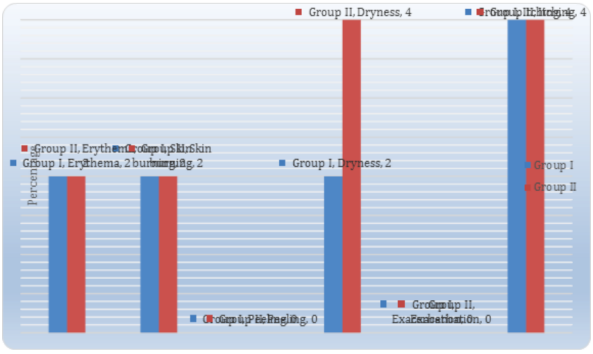
Distribution According To Adverse Events

The table shows distribution according to adverse events among two groups. Out of total 100 patients, most common adverse event was itching; there were 2 (4%) patients each among Group Clindamycin and Group Nadifloxacin respectively with itching. There was no difference when two groups were compared statistically with respect to adverse events. (p>.05)

Table 8 Distribution According To Adverse Events Among Two Groups:

Adverse events	Group–I (Clindamycin 1%)	Group – II (Nadifloxacin 1%)	P value

Erythema	01 (2%)	01 (2%)	>0.05 (NS)
Skin burning	01 (2%)	01 (2%)	>0.05 (NS)
Peeling	00 (00)	00 (00)	>0.05 (NS)
Dryness	01 (2%)	02 (4%)	>0.05 (NS)
Exacerbation	00 (00)	00 (00)	>0.05 (NS)
Itching	02 (4%)	02 (4%)	>0.05 (NS)
Infections	00 (00)	00 (00)	>0.05 (NS)



DISCUSSION

The present study of 100 patients is Single blind randomized open prospective comparative clinical trial undertaken to compare the efficacy and safety of topical clindamycin and topical nadifloxacin in treatment of acne vulgaris with each other. The study period was from November 2021 to October 2022 conducted at Dept. of Pharmacology, CIMS Bilaspur CG.Acne vulgaris is a common disease of the adolescent age group in both the sexes. The prevalence has been found to be as high as 80% through various studies. The presence of acne vulgaris is common during the onset of puberty. Jasleen Kaur et al [11] undertaken with the aim of comparing the efficacy and safety of topical benzoyl peroxide and clindamycin versus topical benzoyl peroxide and nadifloxacin versus topical tretinoin and clindamycin in patients of acne vulgaris. 100 patients between 15 and 35 years having ≥2 and ≤30 inflammatory and/or noninflammatory lesions with Investigator's Global Assessment (IGA) score 2/3 were randomly divided into 3 groups. Group A was prescribed benzoyl peroxide 2.5% gel and clindamycin 1% gel, Group B was prescribed benzoyl peroxide 2.5% gel and nadifloxacin 1% cream and Group C was prescribed tretinoin 0.025% and clindamycin 1% gel. These findings confirm that Group A is more efficacious and Group B is safest among the other two groups. S.Anbarasi et al [12] done randomized, controlled, single blinded study was done to compare the efficacy and safety of nadifloxacin 1% gel against clindamycin 1% cream in mild to moderate cases of acne vulgaris. This study was done in 100 patients with mild to moderate acne vulgaris who were randomized into two groups. There were 50 patients in each group. The medications were applied topically for 8 weeks. They were assessed during the period of medication application at 4 and 8 weeks and then followed up at 12 weeks and 16 weeks. The reduction in the mean number of inflammatory, non-inflammatory and total lesions and CADI were significant from the baseline at all time intervals (p0.05This study has shown that topical nadifloxacin 1% cream is non-inferior to topical clindamycin 1% gel in the treatment of mild to moderate acne vulgaris. Nadifloxacin is a promising drug for the treatment of acne vulgaris. S. Choudhury et al [13] randomized controlled assessor blind trial compared the clinical effectiveness and safety of eight weeks therapy of nadifloxacin 1% versus clindamycin 1% as add-on therapy to benzoyl peroxide (2.5%) in mild to moderate grade acne. The efficacy parameters were changes in the total, inflammatory and non-inflammatory lesion counts, Investigator Global Assessment (IGA), and Cardiff Acne Disability Index (CADI) scales from baseline to study end (eight weeks). All treatment emergent dermatological adverse events were evaluated for safety assessment. Out of 84 randomized subjects (43-nadifloxacin arm) and (41-clindamycin) 42 in nadifloxacin group, 37 in clindamycin group completed the study. Reduction from baseline of total, inflam- matory and non-inflammatory lesion counts were highly significant in both the groups (P< 0.0001), but between group differences were not significant. Topical nadifloxacin, a new fluoroquinolone is effective, tolerable, and safe for mild o moderate facial acne. Its clinical effectiveness is comparable to clindamycin when used as add-on therapy to benzoyl peroxide. Gerd P et al [14] double-blind, multinational, phase III study was to investigate the clinical and bacteriological efficacy of nadifloxacin 1% cream compared with erythromycin 2% cream in 474 European patients with predominantly inflamed slight-to-moderate acne vulgaris. During 12 weeks of treatment both nadifloxacin and erythromycin caused significant reduction in the number of inflamed papulo-pustular lesions (66.7% and 64.7%, respectively) and open and closed comedones. This pivotal erythromycin-controlled study has demonstrated that nadifloxacin 1% cream was as efficacious and safe as erythromycin 2% and extremely low numbers of nadifloxacin-resistant microorganisms were detected in the treatment period.

CONCLUSION

The present study concludes that both topical antibiotics Clindamycin and Nadifloxacin are equally effective in treating mild to moderate acne vulgaris. This study has shown that Nadifloxacin is as effective as clindamycin in the treatment of mild to moderate acne vulgaris. In view of the development of antibiotic resistance by Propionibacterium species, Nadifloxacin will be a better alternative for the treatment of acne vulgaris.

REFERENCES

1. Gollnick H, Cunliffe W, Berson D, Dreno B, Finlay A, Leyden JJ, et al. Management of Acne, A report from a global alliance to improve outcomes of acne. J Am Acad Dermatol. 2003; 49(suppl):S1–37.
2. Zaenglein AL, Graber EM, Thiboutot DM, Strauss JS. In: Acne vulgaris and acneiform eruption in Fitzpatrick's Dermatology in general medicine. 7th ed. Wolff K, et al., editors. New York: McGraw Hill; 2008. pp. 687–703.
3. Tutakne MA, Vaishampayan SS. Acne, rosacea and perioral dermatitis. In: Valia RG, Valia AR, editors. IAVDL Textbook of Dermatology. 3rd ed. Mumbai: Bhalani Publication House; 2008. p. 839-43.
4. Zaenglein AL, Graber EM, Thiboutot DM, Strauss JS. Acne vulgaris and acneiform eruption. In: Wolff K, Goldsmith LA, Katz SI, Gilchrest BA, Paller AS, Lefell DJ, editors. Fitzpatrick's Dermatology in General Medicine. 7th ed. New York: McGraw Hill Companies; 2007. p. 687-703.
5. Pretsch A, Nagl M, Schwendinger K, Kreiseder B, Wiederstein M, Pretsch D, et al. Antimicrobial and anti-inflammatory activities of endophytic fungi Talaromyces wortmannii extracts against acne-inducing bacteria. PLoS One 2014; 9:e97929.
6. Kraft J, Freiman A. Management of acne. CMAJ 2011; 183:E430-5.
7. Del Rosso JQ, Brandt S. The role of skin care as an integral component in the management of acne vulgaris: Part 2: Tolerability and performance of a designated skin care regimen using a foam wash and moisturizer SPF 30 in patients with acne vulgaris undergoing active treatment. J Clin Aesthet Dermatol 2013; 6:28-36.
8. Schfer H, Gollner A, Kusche W, Schwantes U. Effectiveness and tolerance of topical nadifloxacin in the therapy of acne vulgaris (grade I-II): Results of non-interventional trial in 555 patients. J Appl Res. 2009; 9:44–51.
9. Nenoff P, Haustein UF, Hittel N. Activity of nadifloxacin (OPC-7251) and seven other antimicrobial agents against aerobic and anaerobic gram positive bacteria isolated from bacterial skin infections. Chemotherapy. 2004; 50:196–201.
10. Alba V, Urban E, Angeles Dominguez M, Nagy E, Nord CE, Palacin C. In vitro activity of nadifloxacin against several gram positive bacteria and analysis of possible evolution of resistance after two years of use in Germany. Int J Antimicrob Agents. 2009; 33:272–5.
11. Takigawa M, Tokura Y, Shimada S, Furukawa F, Noguchi N, Ito T. "Clinical and bacteriological evaluation of adapalene 0.1% gel plus nadifloxacin 1% cream versus adapalene 0.1% gel in patients with acne vulgaris". J. Dermatol. 2013; 40 (8): 620–5.
12. Kaur J, Sehgal VK, Gupta AK, Singh SP. A comparative study to evaluate the efficacy and safety of combination topical preparations in acne vulgaris. International Journal of Applied and Basic Medical Research. 2015 May; 5(2):106.
13. Choudhry R, Hodgins MB, Van Der Kwast TH et al. Localisation of androgen receptors in human skin by immune histochemistry: implications for the hormonal regulation of hair growth, sebaceous glands and sweat glands. J Endocrinol 1992; 133: 467-75.
14. Anbarasi S, Meenakshi B, Ramya JE. Comparative study of efficacy and safety of clindamycin 1% gel and nadifloxacin 1% cream in patients with mild to moderate acne vulgaris. IOSR J Dent Med Sci. 2017; 16:12-22.