



Acne Vulgaris Plain Clindamycin Treatment

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Abstract: *The Systemic and the topical antimicrobials are effective in the treatment of the inflammatory acne vulgaris; however, the widespread use of these agents is becoming increasingly associated with the emergence of the resistant pathogens raising the concerns about the microorganism resistance and highlighting the need for the alternative nonantimicrobial agents for the treatment of the acne. The Nicotinamide gel provides the potent antiinflammatory activity without the risk of inducing the bacterial resistance. A total of the 75 patients with the inflammatory acne vulgaris were divided into the three groups. Group A was treated with the combination of the 4% nicotinamide and 1% of the clindamycin combination.*

Keywords: Acne vulgaris, Nicotinamide, Clindamycin

I. INTRODUCTION

Acne vulgaris (AV) or commonly referred to as the acne, is a chronic skin disease that occurs due to the obstruction of the hair follicles by the dead skin cells and the sebum and is characterized by the presence of the comedones, pimples, oily skin, and scars. This multifaceted skin disease can be caused by the hyperplasia of the sebaceous glands, microbial colonization, abnormal follicular differentiation with the increased keratinization, and the increased inflammation.^{1,3} AV is experienced by about 75% of the teenagers in the world, who are generally aged between 12-15 years old. The severity peak is at the age of between 17-21. However, a study stated that acne was considered a problem and caused sufferers to become dissatisfied with their appearance and resulted in a lack of the self-confidence. Therefore, the AV patients must get the right treatment. Management of the AV is determined based on its severity. Mild AV is treated with the topical agents, while the moderate and the severe AV are treated with a combination of the topical agents and the systemic agents. One of the topical agents used in the management of the AV is antibiotics. The most commonly used topical antibiotics for the AV are the erythromycin and the clindamycin. The Continuous use of the antibiotics in the management of the AV can cause the resistance to the *Propionibacterium acnes* (*P. acnes*). In 2016, the genomic and the metagenomic investigations were conducted and led to a change in the denomination of the *P. acnes* to the *Cutibacterium acnes* (*C. acnes*).

Niacinamide or the Nicotinamide (NAM) is a form of the vitamin B₃ found in the food and used as a dietary supplement and in the medication. As a supplement, it is used by mouth to prevent and treat the pellagra (niacin deficiency). While the nicotinic acid (niacin) may be used for this purpose, niacinamide has the benefit of not causing the skin flushing.^[4] As a cream, it is used to treat the acne.^[5] It is a water-soluble vitamin. The Niacinamide is the supplement name while the Nicotinamide (NAM) is the scientific name.



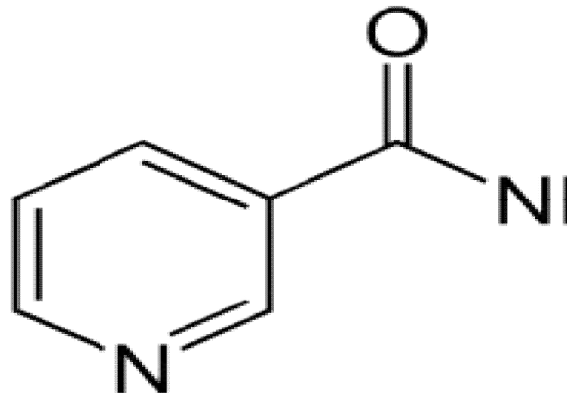
The Side effects are very minimal. At high doses there is a very high chances of occurring liver problems. Normal amounts are safe for the use during pregnancy. The Niacinamide is in the vitamin B family of the medications, specifically the vitamin B₃ complex. It is an amide of the nicotinic acid. The Foods that contain the niacinamide include the yeast, meat, milk, and the green vegetables.^[10]

The Niacinamide was discovered between the year 1935 and 1937. It is on the World Health Organization's List of Essential Medicines. The Niacinamide is available as a generic medication and over the counter. Commercially, the niacinamide is made from either the nicotinic acid (niacin) or the nicotinonitrile. In a number of the countries grains have niacinamide added to them.

The Niacinamide cream is used as a treatment for the acne.^[5] It has anti-inflammatory actions, which may benefit people with the inflammatory skin conditions.^[15]

The Niacinamide increases the biosynthesis of the ceramides in the human keratinocytes in vitro and improves the epidermal permeability barrier in vivo. The application of the 2% topical niacinamide for 2 and 4 weeks has been found to be effective in lowering the sebum excretion rate. The Niacinamide has been shown to prevent the Cutibacterium acnes-induced activation of the toll-like receptor 2, which ultimately results in the down-regulation of the pro-inflammatory interleukin-8 production. The Niacinamide at doses of around 500 to 1000 mg a day decreases the risk of the skin cancers, other than melanoma, in those at the very high risk.

Other skin benefits from the topical niacinamide may include relief to a stripped moisture barrier in the skin, reduced irritation, increase of the collagen production, and the lessening of the hyperpigmentation in the one's skin.



Structure of nicotinamide

The Clindamycin is an antibiotic medication which is used for the treatment of a number of the bacterial infections, including the osteomyelitis (bone) or the joint infections, pelvic inflammatory disease, strep throat, pneumonia, acute otitis media (middle ear infections), and the endocarditis. It can also be used to treat the acne, and some cases of the methicillin-resistant *Staphylococcus aureus* (MRSA) In the combination with the quinine, it can be used to treat the malaria. It is available by mouth, by injection into a vein, and as a cream or a gel to be applied to the skin or in the vagina.

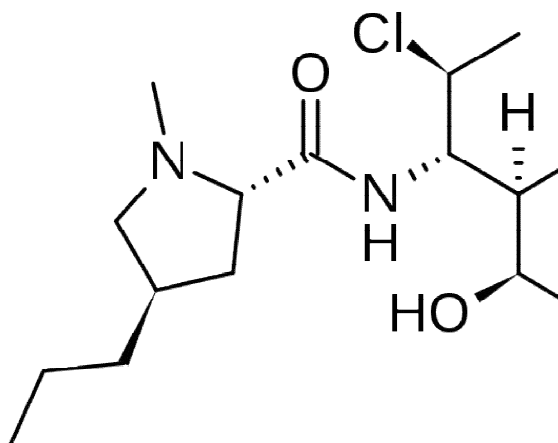
The Common side effects include the nausea and vomiting, diarrhea, rashes, and the pain at the site of the injection. It increases the risk of the hospital-acquired *Clostridium difficile* colitis about



fourfold and thus is only recommended when the other antibiotics are not appropriate. Alternative antibiotics may be recommended as a result. It appears to be generally safe in the pregnancy.^[3] It is of the lincosamide class and works by blocking the bacteria from making the protein.

The Clindamycin was first made in the year 1966 from the lincomycin. It is on the World Health Organization's List of Essential Medicines. It is available as a generic medication. In the year 2020, it was the 125th most commonly prescribed medication in the United States, with more than the 5 million prescriptions.

For the treatment of the acne, in the long term, the combined use of the topical clindamycin and the benzoylperoxide was similar to the salicylic acid plus the benzoyl peroxide. The Topical clindamycin plus the topical benzoyl peroxide is more effective than the topical clindamycin alone. The Common adverse drug reactions associated with the systemic clindamycin therapy found in over 1% of the people include the diarrhea, pseudomembranous colitis, nausea, vomiting, abdominal pain or the cramps and/or the rash. Very High doses (both the intravenous and the oral) may cause a metallic taste.



Structure of clindamycin

II. MATERIAL AND METHODS

The Moderate acne was defined as the presence of the non-inflammatory lesions (including the closed or the open comedones) and the number of the papules and the pustules to be greater than 20 without nodules or cysts.

Patients who had received any topical or the oral medication for the acne vulgaris in the last 1 month was excluded from the study. Patients with the history of the allergy to the clindamycin or the nicotinamide or the history of the renal, hepatic or the endocrine disorders were excluded from the study. Furthermore, the pregnant and the nursing patients or those who use the oral contraceptive pill (OCP) were considered as the exclusion criteria for this study.

This was a systematic review aimed to compare the efficacy of the topical clindamycin and the topical niacinamide in the mild to the moderate AV. In our double-blind investigation, the safety and the efficacy of the topically applied 4% niacinamide gel was compared to the 1% clindamycin gel for the treatment of the moderate inflammatory acne vulgaris. Seventy-six patients were



randomly assigned to apply either the 4% nicotinamide gel (n = 38) or the 1% clindamycin gel (n = 38) twice daily for the 8 weeks. Efficacy was evaluated at the 4 and the 8 weeks using a Physician's Global Evaluation, Acne Lesion Counts, and an Acne Severity Rating.



Acne vulgaris

III. RESULTS

After 8 weeks, both the treatments produced comparable ($P = 0.19$) beneficial results in the Physician's Global Evaluation of Inflammatory Acne; 82% of the patients treated with the nicotinamide gel and the 68% treated with the clindamycin gel were improved. Both the treatments produced statistically similar reductions in acne lesions (papules/pustules; -60%, nicotinamide vs. -43%, clindamycin, $P = 0.168$), and the acne severity (-52% nicotinamide group vs. -38% clindamycin group, $P = 0.161$). Overall, around 60 patients (30 patients in the nicotinamide gel and 30 patients in the clindamycin gel) were evaluated in this study. No one was excluded from the study and all of the patients completed the study. The mean of age in the nicotinamide gel and the clindamycin gel were 20.83 ± 3.34 years and 21.17 ± 3.53 years, respectively, and this difference was not statistically significant ($P > 0.05$).

IV. CONCLUSION

These data demonstrate that the 4% nicotinamide gel is of the comparable efficacy to the 1% clindamycin gel in the treatment of the acne vulgaris. Because the topical clindamycin, like the other antimicrobials, is associated with the emergence of the resistant microorganisms, nicotinamide gel is a desirable alternative treatment for the acne vulgaris. At the end of the 8 weeks, it was concluded that in addition of the nicotinamide was not as much value as in treating the inflammatory acne and the results were some as for the plain clindamycin and also the combination did not offer much relief in the treatment of the resistant acne.

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