Chronic Eczema Treatment by Applying Diphenhydramine Nano-Emulgel - A Case Study

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ABSTRACT

We are presenting a case of 28 years’ old male suffered with atopic eczema, presented as a scaly rashes, skin eruption, itching, burning sensation, persistent red patches, dry scratched skin on the palm of right hand. The patient was given Diphenhydramine nano-emulgel once at bedtime daily. The scratched rough skin turned into soft shiny skin after four weeks.

KEYWORDS: Eczema, Skin Eruption, Scaly Rashes, Scratched Skin, Treatment, Diphenhydramine Nano-Emulgel

INTRODUCTION

Eczema is idiopathic chronic allergic disorder that may run in families, resulting in red patches over skin surface that become itchy, irritated and scratched dry skin1,2. Different types of eczema may occur like atopic dermatitis, seborrheic dermatitis, contact dermatitis, stasis dermatitis, dyshidrotic eczema and nummular eczema. Atopic dermatitis affects 21% across the countries of the world, more common in children2,3. Psychologically, it is very frustrating condition to scratch an itchy scaly rash. Antihistamines help with sleep in order to decrease the scratching during night time4. In present case study, patient was diagnosed with atopic eczema. This report enlightens the use of Diphenhydramine (DPH) nano-emulgel over the itchy scaly rash skin once a day at bedtime. Diphenhydramine hydrochloride is first generation anti-histamine and considered suitable candidate for topical delivery. It is lipophilic in nature, having molecular weight 291.82 g/mol (less than 1KDa) and metabolize in liver. It can easily cross blood brain barrier, having 40-60 % bioavailability5,6. DPH nano-emulgel was formulated by using olive oil and propylene glycol (PG) as permeation enhancers and fixed amount of polymer like cabopol-940.

CASE REPORT

A Twenty-eight (28) years’ young male, living in Southern Punjab (Multan) presented with complaints of red scaly rashes over the right palm of hand with intense itching and cracked skin since childhood with familial history (from his mother). His condition has become worsen due to the environmental changes especially in winter and also due to eating beef. The dried scaly lesions were presented over the surface of palm of right hand (approximately 5×6 cm). He felt smell and tenderness over the scaly lesions. There was history of taking many homeopathic and allopathic treatments containing anti-allergic tablets, ointments, creams but none was successful to treat the atopic dermatitis. The hematological, serological and allergenic tests were done before starting the treatment, showed positive allergen specific IgE, confirming the atopic eczema. There was elevated level of serum immunoglobulins (IGE) and peripheral blood eosinophilia. The rapidly growing microorganisms were also detected through ATP. Colonization over scaly rash skin with Staphylococcus aureus was also observed. There was no other associated disease diagnosed.

Considering the test’s profile, the patient was advised to apply the Diphenhydramine (DPH) nano-emulgel (1% W/W) over affected areas of the palm of hand once a day at bedtime after the written agreement from him and his guardian. He was also advised to avoid from eaten beef during treatment. Photographs of his hand were taken at first day. Patient has continued to use transdermal medication. It was observed that skin lesions started improving by the fourth day and completely improved by four weeks.

The photographs of eczematous conditions have shown in Figure 1. In Figure 1 (a), before treatment, the patient complained the scratched skin (ooze and crusty) with pus and bad smell. In Figure 1 (b), after 5 days of treatment with DPH nano-emulgel, scaly rashes were going to better having no pus. In Figure 1 (c), after 10 days of treatment, the condition became better. In Figure 1 (d), after 15 days of treatment,
there was only few eczematous spots on the palm of hand. In Figure 1 (e), after the 20 days of treatment, the roughness of skin was turned into softness. In Figure 1 (f), after 28 days, the palm skin was soft and clear like the left palm of hand. The atopic eczema was completely treated in 28 days. The hematological, serological and allergenic tests were also done after the completion of treatment that showed decreased level of serum immunoglobulins (IgE).

DISCUSSION

The most important risk factor for hand eczema is atopic dermatitis, occurring mostly in school going children. The condition become more severe due to hereditary factors, appear in young age9,10. The atopic eczema may be occurring due to lack of skin protein (Filaggrins)11. The findings suggest that atopic dermatitis was due to the family history. There was elevated serum level of eosinophils and IgE indicating allergic disease/infection is present.

Some home remedies was suggested for patient like to avoid from long baths in soapy water and hot showers, use body cleanser and emollient substances (Petroleum jelly) to evaporate water from skin12,13.

The patient was treated with DPH nano-emulgel and it was seen that DPH nano-emulgel helped to reduce the colonization of S. aureus. Diphenhydramine nano-emulgel contains the olive oil that deeply penetrates into skin and provides cleansing and smoothing effect over the skin14, 15. It has also moisturizing property that protect the skin from over dry. Olive oil has antioxidant16, 17 and anti-bacterial property that helpful in fighting against inflammatory cells to reduce inflammation18-20.

Propylene glycol, another ingredient in DPH nano-emulgel, used as humectant solvent21. It is non-irritant to skin and helps to deeply penetrate the drug into skin.

In summary, the DPH nano-emulgel formulation is rich in anti-inflammatory, anti-oxidant, non-irritant and deeply penetrating enhancers that help the skin nourishment into normal; position with smoothing and emollient effects8. The olive oil has ability to lower the risk of atopic dermatitis for infants and young patients when compared with emollient creams and ointments. This has been supported by previous publication22.

CONCLUSION

The current DPH nano-emulgel formulation is rich in anti-inflammatory, anti-oxidant, non-irritant and deeply penetrating enhancers that help the skin nourishment into normal; position with smoothing and emollient effects, by applying on the affected skin rashes area once a day at bed time.

CONTRIBUTION OF AUTHORS

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Arshad M: Literature search, Literature review

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