Novel Lotion Formulation Using Polymeric Emulsion Technology for Improved Skin Moisturization and Drug Permeation in Patients With Psoriasis

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OBJECTIVE

For uniform absorption of active ingredients and hydrating excipients, the active ingredient and moisturizing/hydrating agents are encapsulated within oil droplets (Figure 1). With polymeric emulsion technology, the active ingredient and moisturizing/hydrating agents uniformly and independently deliver their properties to the skin, with the active ingredient released by the 3-D mesh (Figure 2). Polymeric emulsion technology allows for the release of the 3-D mesh, oil soluble moisturizing agents held apart by the 3-D mesh (Figure 3). Upon contact with salts on the skin, the polymeric matrix (3-D mesh) dissolves, allowing for uniform absorption of active ingredients and hydrated excipients (Figure 1).

PROTOCOL

A novel approach to topical lotion formulation utilizing polymeric emulsion technology was used in this study. The vehicle lotion formulation provided rapid and sustained increases in skin moisturization (Figure 1) and gradual decreases in TEWL (Figure 2) over 24 hours.

RESULTS

Polymeric Emulsion Technology Formulation

The active ingredient and moisturizing/hydrating agents are encapsulated within oil droplets (Figure 1). Polymeric emulsion technology allows for the release of the 3-D mesh, oil soluble moisturizing agents held apart by the 3-D mesh (Figure 2). Upon contact with salts on the skin, the polymeric matrix (3-D mesh) dissolves, allowing for uniform absorption of active ingredients and hydrated excipients (Figure 1).

Methodology

B. Mesh Dissolves

- Skin hydration and epithelial barrier maintenance with the vehicle lotion were assessed through corneometry and transepidermal water loss (TEWL; N=10)
- Percutaneous permeation of active ingredient(s) into the dermal layers was estimated through a receptor-dermis-vehicle setup (15 cm²) and administered to 15 participants

CONCLUSIONS

Lotion formulations for the treatment of psoriasis and acne have been developed that utilize an innovative polymeric emulsion technology and an optimal selection of emollients, emulsifiers, and humectants.

The validation formulation is nonirritating, aesthetically pleasing, and provides enhanced barrier to the skin.

Further, application of the lower dose HP/TAZ and HP lotion formulations resulted in higher permeation efficiency of the active ingredients compared with application of HP or TAZ cream alone.

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REFERENCES


AUTHOR DISCLOSURES

Dr. Linda Stein Gold has served as investigator/consultant or speaker for Ortho Dermatologics, LEO, and Merck. Dr. Tina Lin is an employee of Ortho Dermatologics and may hold stock and/or stock options in its parent company. Dr. Emil Tanghetti has received research support from Ortho Dermatologics and Accure. Dr. Linda Stein Gold has served as investigator/consultant or speaker for Ortho Dermatologics, LEO, and Merck. Dr. Tina Lin is an employee of Ortho Dermatologics and may hold stock and/or stock options in its parent company.