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Research Article

Selective Eviction of Deformed Horny Cells by JRK's Psorolin Derma Skin Care Soap

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Abstract

The importance of regaining the eccrine function by removing all possible blockages occurring over the skin during Psoriasis as a result of continuous deposition of desquamated cornfield cells require a medicated cleanser with selective targeting of deformed horny cells. Present study details about JRK's Psorolin derma skin care soap normalizing eccrine function, removing all deformed horny cells and also resulting in greater porosity of skin to the subsequent treatment through well-structured scientific experiment. We have employed Eosin and Nile red uptake assay on tape strips, urease-GLDH assay and localized eccrine quantification in response to intradermal Methacholine chloride. Findings clearly show JRK's Psorolin derma skin care soap met all the necessary pre-requisites to be the best candidate cleanser for psoriasis patients, details are discussed in the article.

Keywords: Eccrine Function in Psoriasis; Deformed Cells; Removal of Dead Cells; Psorolin Derma Skin Care Soap; Selective Removal of Dead Cells; Stratum Corneum Removal

Introduction

Horny layer of the skin is otherwise called as stratum corneum., is strictly a non-neucleated, scleroprotein deposition, offers great physical and functional barrier benefit to the skin [1]. Horny cell formation occurs as a result of the multiplication of keratinocyte mother cell located beneath the epidermis or above the dermis [2].

The stratum basale otherwise called as stratum germinativum divides and then migrate upward by passing through series of succession of phases and then becomes stratum corneum [3]. The turnover cycle time of stratum germinativum to stratum corneum remains more or less constant for all human being. But during injury and or other reasons, the cell cycle time can greatly and or moderately get modify. Besides the modification in the turnover time of horny cells, timely removal of the same from upper layer of the skin is also equally important and only then the subsequently formed cells will have the space to occupy to offer the physical and physiological function required for the skin and also to remove and replenish the old cells. But several skin conditions know to impede the above process resulting in accumulation of cells one over the other and form an uneven heap of cells over the skin affecting both the cell cycle and barrier function.

Psoriasis is a multifactorial, autoimmune disease where keratinocyte is postulated to be due to the trigger and warnings of Langerhans cells and also due a set of cytokines (inflammatory mediators), multiply rapidly by crushing the actual cycle time and the demand of the skin, resulting in formation of plenty of daughter cells obliviously non-identical both structurally and functionally [4]. Such cells not only fail to offer any benefit to the skin but instead goes as burden to the skin by getting deposited one over other.

To regain the normal rhythm of keratinocytes and horny cell generation time, the treatment strategy must include both calming down the pro-inflammatory mediators as well as targeted removal of the deformed horny cells unwantedly deposited over the skin besides slowing down the signal receptivity for multiplication. Such an approach may reboot the factory of keratinocyte in the epidermis.

Dislodgement of the horny cells of the skin in human being is greatly achieved by way of cleansing the skin using surfactants such as soaps, bath/shower liquids etc. [5]. Surfactants remove the horny cells by physio-chemical means. However, if the formulation of the cleanser is designed accordingly with suitable pro-inflammatory mediators incorporated in the formulation, pH balance and super fattening are done along with adjusted-time release of sequestering agents to make the lather weak, small and does not hold or gather high amount of air, then the targeted removal of the horny cells can be achieved easily.

In the present paper, we report the targeted eviction of deformed horny layer of the skin by Dr JRK's Psorolin derma skin care soap and its selective therapeutic use in the treatment of Psoriasis and other inflammatory conditions of the skin. Further, the role of JRK's Psorolin derma skin care soap in improving the percutaneous absorption of topical drug - Psorolin B ointment also has been established.

Materials and Methods

Formulation Details of JRK's Psorolin Derma Skin Care Soap

JRK's Psorolin derma skin care soap is formulated with the extracts of Wrightia tinctoria, Cynadon dactylon, Boswellia serrata, Aloe vera and Hydnocarpus laurifolia in Grade 1, PFA (Palm Fatty Acid) base with a pH of 10.

Composition:

Each 75 gm contains extracts of

- Wrightia tinctoria: 10%
- Cynadon dactylon: 10%
- Boswellia serrata: 1%
- Aloe vera: 1%
- Hydnocarpus laurifolia: 0.2%
- Excipients: Q.S

Details of Healthy Volunteers Empaneled in the Study

10 human volunteers (7 females and 3 male), the regular users of Psorolin derma skin care soap were checked for their willingness to take part in the present study. The study was conducted with informed consent of the volunteers and as per the Helsinki declaration. The volunteers come under the type III and IV as per Fitzpatrick skin type.

The product JRK's Psorolin derma skin care soap is a registered Siddha cosmetic soap available in the market and is being used extensively by people in India and a few other parts of the world. All the volunteers consented to provide date for the present study were of the age group 24-35 years and do not have any skin infection or other dermatological conditions that might interfere into the study findings.

Product Usage Protocol and Sample Collection Details for Direct Microscopy

Selective Eviction of Deformed Cells: The volar forearm region was selected for sampling. The preselected region in the right forearm was washed with JRK's Psorolin derma skin care soap and the left forearm was washed with distilled water which served as control at a room temperature of 25 ± 2°C and 75% ± 10% relative humidity. After 3hrs of washing, stratum corneum samples were collected using cyanoacrylate tape (5 cm^2), applied over the skin, pressed gently for a minute and then removed. Two such separate samples were made from each forearm site from each volunteer. Similarly, the sampling was also done from control site where distilled water was used as cleanser.

One set of samples from all volunteers was stained with eosin and the other set of the sample was stained with Nile red. Samples collected from both control and treatment sites were stained by the respective stains and were then examined microscopically.

The following observations were recorded such as:
1. Characteristic size and integrity of the cells
2. Eosin dye permeation and extent of boundary visibility of individual cells
3. Extent of Nile red dye uptake
4. Relative abundance of well-formed and deformed stratum corneum cells

The findings between treatment and control regions were compared.

Increased Percutaneous Drug Absorption of Skin Post Use of Product by Urease-GLDH Assay
For the present study, we have used the quantity of urea absorption by stratum corneum cells versus time in tape stripped cells [6,7]. The volar forearm skin region - 5 cm^2 was treated with 1 mg/ml of urea in solution form prepared in distilled water. The solution was applied over the skin and after the interval of 30 and 60 minutes, stratum corneum samples were collected using vinyl tape and the accumulated urea in the cells was determined by colorimetry by employing urease-GLDH method.

Difference in absorption of urea in forearm sites pre-treated with Psorolin derma skin care soap or plain water were compared. The stratum corneum cells in urea treated and control sites after the above listed time points were studied separately.
Effect on eccrine function [8,9].

Improvement in eccrine activity in the skin especially in the anterior region of forearm after treatment with JRK's Psorolin derma skin care soap vis-à-vis control site (distilled water treated) were studied. For this purpose, the treated sites after 10 minutes of calibration of the skin to ambient temperature were subjected to Methacholine chloride intradermal injection (0.1 ml) 1:500 dilutions and then the eccrine activity in test and control sites were measured and recorded by counting:
1. Pore count
2. Rate of eccrine discharge
Iodine-paper technique was employed for the above purpose.

Results
Twenty and ten percentage of cells respectively dislodged from the treatment site only had well defined cell boundary and absence of distortion as revealed by eosin staining and Nile red dye uptake. Whereas, 60% and 40% of cells tape stripped from control site showed complete characteristics of healthy stratum corneum. The tape strip collected from treatment site had fewer cells when compared to control site where the cells were abundant, Table 1.

Measurement Parameter	% of Cells	
	Treatment	Control
Cell Integrity Post Eosin Dye	20	60
Nile Red Stained Cells	10	40
Quantity of Cells Dislodged	Sparse	Abundant

Table 1: Selective eviction of deformed cells.

The Psorolin derma skin care soap treatment has significant impact in the permeation of urea when compared to the distilled water treatment (control site), Table 2.

Test Area Details	μg of Urea Recovered Versus Time			
	Treatment Site		Control Site	
	30′	60′	30′	60′
2.5 cm^2	2	3	1	1.3
5.0 cm^2	3	5	2	1.8

Table 2: Urea absorption in stratum corneum cells.

Psorolin derma skin care soap treatment has significantly increased the eccrine activity in all 10 volunteers than the control group where distilled water was used for cleansing, Table 3.

No. of Volunteer	Average Number of Pharmacological Activation of Eccrine Glands/cm^2	
	Treatment	Control
10	89±11	41±27

Table 3: Eccrine activity post treatment.

Discussion

A strong medical or pharmacological benefit from toiletry preparations, especially from soap to address certain dermatological problems is seldom expected, however showing an inclination towards such products by people at large is increasing these days. Dr. JRK's Research and Pharmaceuticals Pvt., Ltd., Chennai always focus and prioritize distinct medical benefit and definite relief to the end users from all its deliveries (products). Psorolin derma skin care soap, the company has brought out after several levels of brain storming, extensive market analysis, series of interaction with dermatologists with reference to expected and possible dermatological benefits from soaps and intense research. Several medicinal herbs have been incorporated in the formulation after studying the surfactant - phytochemical interaction, pH sensitivity and stability of bio-activity in the PFA system. Necessary caveats in the form of supper fattening, levelling of sequestering agents, glycerin-ionization of the base has been done to achieve the stability of the phytoactives.

The medical benefits offered by Psorolin derma skin care soap, the company wants to establish unambiguously in order to ensure the dermatological benefit is distinct and appreciable by the patient. Findings of the present study has clearly revealed that Psorolin derma skin care soap selectively dislodge the deformed stratum corneum cells than the well-formed cells. Examination of cells in the tape stripping from Psorolin derma skin care soap treated site showed that only a very small proportion of cells were well-formed and also could take up Nile red dye suggesting the above postulate of Psorolin derma skin care soap selectively target deformed stratum corneum cells than active cells. Nile red would permeate into the cells where lipid granules are rich. The ill-formed cells are unlikely to have rich lipid granules and hence the cells collected from the control site did not show high Nile red uptake. After generating first level of proof to our postulate, we went further to study how such selective eviction of ill-formed stratum corneum cells would benefit the percutaneous absorption of the skin towards the subsequent topical medicament. We have employed urease-GLDH assay on tape stripped cells from treatment and control sites. We found that treatment with Psorolin derma skin care soap could increase the dermal permeation greatly as reflected by urea accumulation in the stratum corneum cells. Only when the ill-formed cells are removed, the active stratum corneum cells will get clear exposure to subsequent dermal medicament and hence could absorb the same significantly.

After establishing the fact that Psorolin derma skin care soap selectively targets the ill-formed stratum corneum cells resulting in increased dermal permeation, we want to establish further proof for how Psorolin derma skin care soap would benefit Psoriasis patients. When the ill-formed stratum corneum cells are removed and permeability of the skin is improved, the possibility of restoring the eccrine activity is expected to be quite high. In psoriatic condition, eccrine malfunction is quite evident and obvious. Eccrine function in the Psoriatic skin is being attempted these days for prognosis purpose, post treatment [10]. The Psorolin derma skin care soap is formulated with medicinal herbs proven to have anti-psoriatic benefit and hence our quest for understanding how Psorolin derma skin care soap would benefit Psoriasis patient plagued our further research on eccrine function. We have pharmacologically activated the eccrine function in both Psorolin derma skin care soap treated and control

sites. To our surprise, we found that Psorolin derma skin care soap treatment significantly increased the eccrine function than the control product suggesting clearly that Psorolin derma skin care soap has definite treatment benefit in psoriasis conditions.

Conclusion

Our research on Psorolin derma skin care soap clearly prove that definite clinical benefit can be achieved even through a soap formulation despite the product is likely to have very short contact time with skin. Mere incorporation of the ingredients into the formulation is not sufficient but in-depth research validation is also necessary to ensure the therapeutic benefit that would delight both the patient and the treating clinician. Psorolin derma skin care soap based of the body of the proof, it will have significant role in Psoriasis conditions and aide various topical medicaments for the same.

Conflict of Interest

The authors have no conflict of interest to declare.

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