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Development of cosmeceutical cream for dermatitis and acne vulgaris

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Abstract

Dermatitis and pimples vulgaris is regular place pores and skin issue, occurring in around 85– 95% of young people. It is related with filaggrin gene and Propionibacterium acnes contamination individually. Our motivation of present research is to outline new cream which diminish Itching because of Dermatitis and follow up on skin break out Vulgaris. Following cream is unpredictable total of Salicylic corrosive and retinol which benefits as wonderful pores and skin treatment. The patch test for affectability testing has additionally been proficient and no confirmation of pores and skin irritation and unfavorably susceptible signs and side effects likewise stability testing of cream test has been directed in the natural chamber with temperature $25 \pm 10\text{C}$ and mugginess $60 \pm 10\%$ RH. the merchandise no flag of segment partition and no exchange inside the shading. The work essentially centers around microbial quality control and Dermatitis enthusiasm of planned cream. In future this detailed cream will convey promises to healthy skin and Anti – Itching with mending impacts.

Keywords: Dermatitis, acne vulgaris, itching, salicylic acid, vitamin A

Introduction

Acne is the most common type of skin disorder. it required new skin care formulation. Presented Cream is complex mixture of Salicylic acid, Retinol and calamine. Recent studies show that mutation observed in outermost layer of skin result in a topic dermatitis. More than around 45 million peoples suffering from Acne and 80% of people in USA will get affected at one point in their life. Due to combination of both calamine and salicylic acid it is easy to negotiate the side effect of retinoids. Prevention of Acne will reduce risk factors. However Salicylic acid and retinol both drugs will relieve the skin problems. As calamine acts as anti- itching agent helps in relieve irritation occur due to dermatitis and Eczema. In USA nearly 10% to 20% infants and some children are infected. The patients of eczema are at high risk of viral infection. salicylic acid act as Keratolytic agent and bacteriostatic agent. Which cause opening of clogged pore on skin and prevent them from clogging up again. Retinol exact mechanism of action is not known but Several studies shows that it induce apoptosis (programmed cell death) various cells in body isomer of tretinoin used orally for severe acne [1, 6].

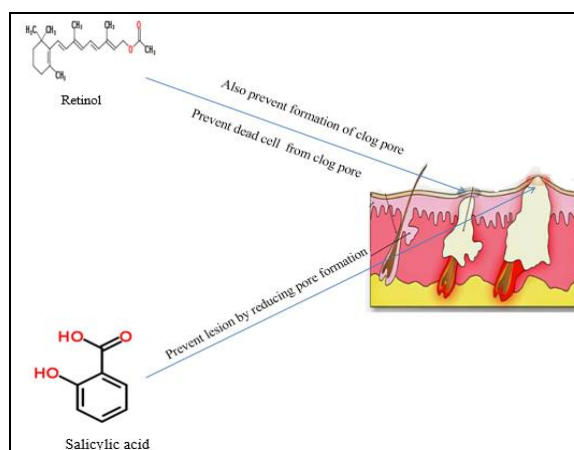


Fig 1: Mechanism of action of Retinol and salicylic acid on Acne Vulgaris.

Atopic dermatitis is inflammatory disease of skin, which involve the hyperactivity of cutaneous layer. Recent studies show that dermatitis related with immunological and inflammatory reaction. This is major public health problem will affect 1-20% person worldwide also during lifetime it occur to 10 -20% in children and 1-3% in adults. National survey in US state approximately in 17.2% children's suffering from AD last 17 years. Mainly develop on dry skin and produce non-lesioned skin. According to twin studies of atopic dermatitis in several patients it indicates in 0.72-0.86% in monozygotic and 0.21-0.23% in dizygotic patient genetic factor play vital in development of this disease. Mutation in FLG gene develop sign of dermatitis. Recent approaches suggest that biologics can be implemented as

new therapy for AD in future [1].

Salicylic acid act by mechanism through reducing lesion formation by unclogging pore. However, it does not affect the sebum production and bacterial growth. Also, retinol is most effective drug against Acne vulgaris, act by same mechanism as that of salicylic acid. Topical application of this cosmeceutical cream it spread on skin layer and penetrate through the skin. Retinol also helps by unclog the pore it allows to work better action of salicylic acid on acne. Recent studies on retinol shows that it helps to decrease the oil production and act as antibacterial thus prevent bacterial growth in acne. Since this cream also contain small amount of calamine it will repair damaged tissue.

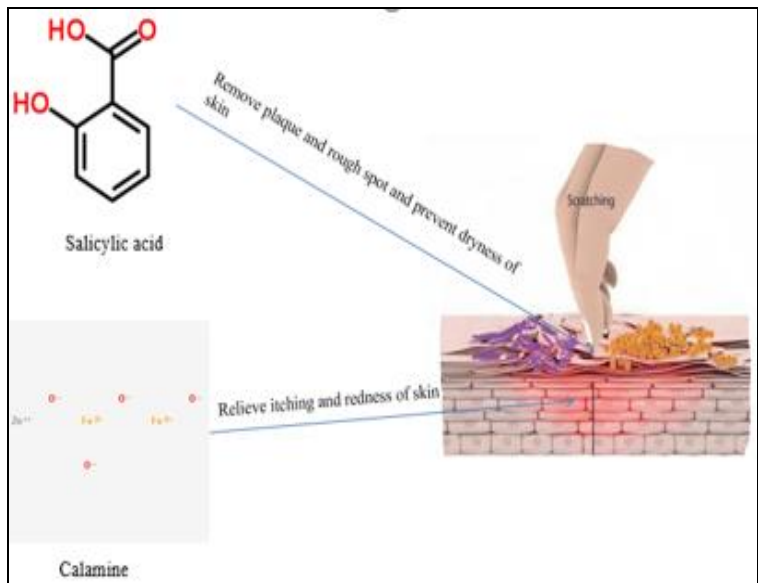


Fig 2: Mechanism of calamine with Salicylic acid on Atopic Dermatitis.

Calamine act on dermis layer of skin and denatured bacterial growth. Salicylic acid used to treat eczema due its keratolytic property on epidermis layer of skin, also reduce rough dark spot and plaque effectively. Due to its ability as keratolytic agent it soften the keratin and help to loosen dry skin [2].

Materials and Methods

Chemicals

Retinol and Salicylic acid was obtained gift sample (Iasons, India. Pvt. Ltd), other chemicals such as Calamine, Preservatives, emollients all the materials were obtained commercially and used as such.

Formulation Method

Firstly added Salicylic acid, water and calamine in to heat resistance glass beaker and stirred well (Phase I), on other hand mixture of Paraffin wax and Lanoleic acid melted in other beaker(Phase II) and stirred well to make cream base. phase I becomes viscous with heating at 65°C-75°C, constantly stirring, after that used homogenizer for mixing to above prepared emulsion with little drop of Rose water when it goes hand warming or lower than 40°C and mixed well until we got smooth and uniform texture. Stored at room temperature (Table no.2).

Evaluations parameters

Take 5 gm of cream in clean platform and observe visually

A. Physical Characteristics

The defined creams were watched outwardly for their shading, homogeneity, stage partition, consistency, spread capacity. The pH was estimated with help of pH meter (Table no.1).

B. Patch Test

1-3gm cream to be tried was set on a bit of texture and connected to the touchy piece of the skin e.g. skin behind ears. The corrective to be tried was connected to a region of 1sq.m. of the skin. Control patches were likewise connected. The site of patch is investigated after 24 hrs.

C. Microbiological studies

The creams were vaccinated on the plates of agar media by streak plate technique and a control was set up by overlooking the cream. The plates were set in to the hatchery and are brooded at 37°C for 24 hours. After the hatching time frame, plates were taken out and check the microbial development by contrasting it and the control (Figure. 3).

D. Spreadability studies

A test for semisolids is that it has better spreadability which is a term communicated to mean the degree of region to which the cream promptly spreads on application to the skin Spreadability is communicated as far as time in seconds taken by two slides to slip off from the detailing, set

between, under the utilization of a specific load. Lesser the time taken for the division of the two, better the spreadability. Two glass slides of standard measurements were chosen. The detailing whose spreadability must be resolved was put more than one of the slides. The other slide was put over the definitions was sandwiched between the two slides over the length of 5 cm along the slide. 100 g weight was set up on the upper slide with the goal that the definition between the two slides was squeezed consistently to frame a thin layer. The weight was evacuated and the abundance of definition sticking to the slides was rejected off. One of the slides was settled on which the detailing was put. The second portable slide was set over it, with one end attached to a string to which load could be connected by the assistance of a basic pulley and a container. A 30g weight was put on the container and the time taken for the upper slide to venture to every part of the separation of 5.0cm and separate far from the lower slide under the heading of the weight was noted. The spreadability was then figured from the accompanying equation ^[1, 3].

$$\text{Spreadability} = m \times l / t$$

m = weight tied to the upper slide (30g) l = length of glass slide (5cm) t = time taken in seconds

E. Stability studies

The stability testing about were done according to ICH rules. The cream filled in bottle and kept in mugginess chamber kept up at 30 ± 2°C/65 ± 5 % RH and 40 ± 2°C/75 ± 5 % RH for three months. Toward the finish of studies, tests were dissected for the physical properties and thickness ^[4].

Result and discussion

Defined 10 gm cream has splendid Golden yellow shading with smooth surface. pH of definition observed to be 6. The strength investigations of the different parameters like visual appearance, nature, pH of the plans demonstrated that there was no critical variety following three months of the examination period. (Table 5) The definition demonstrates

no redness, edema, aggravation and bothering amid Patch Test contemplates. These definitions are protected to use for skin. The planned creams were tried for the nearness of pathogenic microorganisms by refined it with agar medium. There were no indications of microbial development after hatching time of 24 hours at 37°C and having antimicrobial property. (Figure 3) We didn't found any hypersensitive conditions however we encourage to counsel with doctor or drug specialist and ought to be recommended in the event of pregnant ladies or who are intending to pregnancy ^[5, 6].

Table 1: Physical Characteristics

S. No.	Properties	Formulation
1	Color	Golden yellow
2	Odor	Characteristics
3	Appearance	Semi-Solid
4	Texture	Smooth

Table 2: Formulation and Roles (10 GM)

Ingredients	Role	Quantity
Retinol	Active ingredient	0.6 gm
Salicylic acid	Antimicrobial agent	1.5 gm
Calamine	Anti -Itching agent	0.5 gm
Paraffin	Moisturizer	2.5 gm
Lanoleic acid	Emulsifying agent	2.0 gm
Rose water	Perfuming agent	0.02 ml
Methyl Paraben	Preservative	0.02 ml
Distilled water	Diluent	3.36 ml

Table 3: PH determination and thermal stability

S. No	Parameters	formulation
1	Thermal Stability (RH 65% and 30 ± 40°C)	Stable, No oil Separation
2	pH (27°C ± 2°C)	6

Table 4: Spreadability Test

Formulations	Time (Min)	Spread ability (g cm/sec)
New Research	16	11.4
Marketed Cream	18	11.5

Table 5: Accelerated Stability Studies

Months/ Tests	Formulation		
	After one month	After third month	After second month
Physical appearance	Semi-solid	Semi-solid	Semi-solid
Texture	Smooth	Smooth	Smooth
color	Golden yellow	Golden yellow	Golden yellow
Odor	Characteristic	Characteristic	Characteristic
pH value	6	6	6
Thermal stability	ok	ok	ok
Degradation of product	nil	nil	nil
consistency	ok	ok	ok

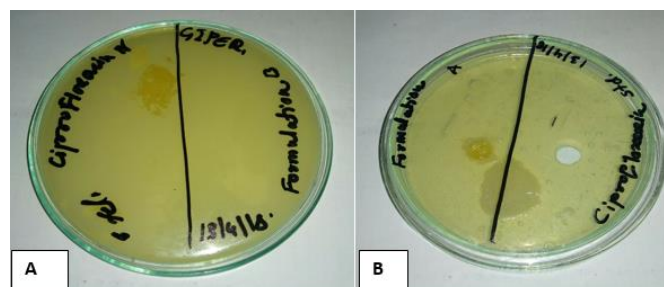


Fig 3: Microbiological Assay
 A) Ciprofloxacin (Standard) and Formulation with gram (+) bacteria;
 B) Ciprofloxacin (Standard) and Formulation with gram (-) bacteria

Conclusion

Skin inflammation vulgaris is serious skin issue that burden individuals in their pre-adulthood. Skin inflammation vulgaris or known as skin inflammation is a human skin ailment portrayed by skin with flaky red skin, clogged pores and whiteheads, pinheads, huge papules, pimples and scarring. Skin break out vulgaris is an illness of pilosebaceous considered by the development of open and shut comedones, papules, pustules, knobs and sores. Skin break out influences skin having thick sebaceous follicles in regions including face, chest and back. Skin break out isn't dangerous however extreme skin inflammation can influence mental status and social exercises. The present survey centers around a the study of disease transmission, etiology, pathogenesis, finding, differential analysis and administration of skin break out with the pharmaceutical measurements types of oral and topical organizations. Show look into centers around improvement of solution with exceptionally helpful impact, employments of vitamins for feeding, hostile to skin inflammation and decrease tingling which give useful impacts to dermatology this pharmaceutical will lessening issues in puberty for healthy skin in future. The readied plans demonstrated great spreadability, no confirmation of stage partition and great consistency amid the investigation time frame. Dependability parameters like visual appearance, nature and aroma of the details demonstrated that there was no huge variety amid the examination time frame.

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