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FORMULATION AND EVALUATION OF ECZEMA CREAM

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ABSTRACT

Atopic Dermatitis, commonly known as eczema, is a common chronic, relapsing skin disease characterized by pruritus, disrupted epidermal barrier function, and immunoglobulin e- mediated sensitization to food and environmental allergens. AD is often called the "itch that rashes" because the itching starts, and then the skin rash follows as a result of scratching. This eczema can cause two types of pigmentation changes that are, Hypopigmentation and Hyperpigmentation. Eczema is a complex disease that arises from interaction between genes and environment. There are 3 classical stages of eczema: infantile, childhood, 1and adulthood. Eczema is a type of condition that causes skin inflammation. Therefore, topical preparations are at core of eczema treatment; these includes topical moisturizers, topical corticosteroids, and topical calcineurin inhibitors. However, even with careful treatment, eczema is likely to relapse.

KEYWORDS : *Atopic dermatitis(AD), Pruritus, Chronic skin disorder, Topical preparations, skin inflammation.*

INTRODUCTION

1. DEFINATION

Eczema is an condition which cause your skin to become dry, bumpy and itchy patches of soft skin , it is an common condition that isn't contagious.

Eczema is an type of dermatitis ,it is group of condition that causes skin inflammation.

2. TYPES:

There are various types of eczema they are as follows = atopic dermatitis , contact dermatitis , neuro dermatitis, dyshidrotic eczema, hand eczema, neurodermatitis, stasis dermatitis, nummular eczema.

Eczema is common and affects more than 31 million Americans. Infants are prone to eczema, and 10% to 20% will have it. However, nearly half of all infants diagnosed with eczema outgrow the condition or have significant improvement as they get older.



Figure 1: Types of Eczema cream

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3. SYMPTOMS

The most common symptoms of eczema include:

- dry, scaly patches of skin
- thickened, discoloured skin
- open, crusted, or weeping sores
- skin flushing
- itching

An eczema rash may appear Gray or brown in people with dark skin tones, which could make AD harder to see. That said, people with darker skin tones may also get dark or light skin patches even after eczema symptoms go away. If you have a light skin tone, an eczema rash can look pink, red or purple. These patches are known as hyperpigmentation, depigmentation, or hypopigmentation. They may last a long time. A dermatologist can look at these patches and develop a treatment plan, which may include steroid creams.



Figure 2: Eczema Condition

4. CAUSES

There is no known cause of eczema. However, health professionals believe that it may There develop from a combination of genetic and environmental factors. Children are more likely to develop eczema if a parent has it or another atopic condition, such as asthma and hay fever. If both parents have an atopic condition, the risk is even higher. Some environmental factors may also bring out the symptoms of eczema, such as :

- **Irritants:** These include soaps, detergents, shampoos, disinfectants, and juices from fresh fruits, meats, and vegetables.
- **Allergens:** Dust mites, pets, pollens, and Mold can all lead to eczema. This is known as allergic eczema.
- **Microbes:** These include bacteria such as *Staphylococcus aureus*, viruses, and certain fungi.
- **Hot and cold temperatures:** Very hot and very cold weather, high and low humidity, and perspiration from exercise can bring out eczema.
- **Foods:** Dairy products, eggs, nuts and seeds, soy products, and wheat can cause eczema flares.
- **Stress:** This is not a direct cause of eczema, but it can make the symptoms worse.
- **Hormones:** Females may experience increased eczema symptoms when their hormone levels are changing, such as during pregnancy and at certain points in the menstrual cycle.

- **CREAM**

Pharmaceutical preparations for the treatment of conditions such as rashes, skin irritation, stings, fungal infections, etc. are normally supplied in the form of a Cream or ointment as this provides an effective means of delivering the active ingredient directly to the required area.

Pharmaceutical Creams (topical preparation) are homogeneous, semi-solid or viscous preparations that possess a relatively fluid consistency and are intended for external application to the skin or certain mucous membranes for protective, therapeutic or prophylactic purposes especially where an occlusive effect is not necessary.

In recent times. Creams are emulsions of either the O/W or W/O type. Pharmaceutical creams are classified as water-removable bases in the USP and are described under Ointments. or Creams are defined as “viscous liquid or semi-solid emulsions of either the oil-in-water or water-in-oil type.

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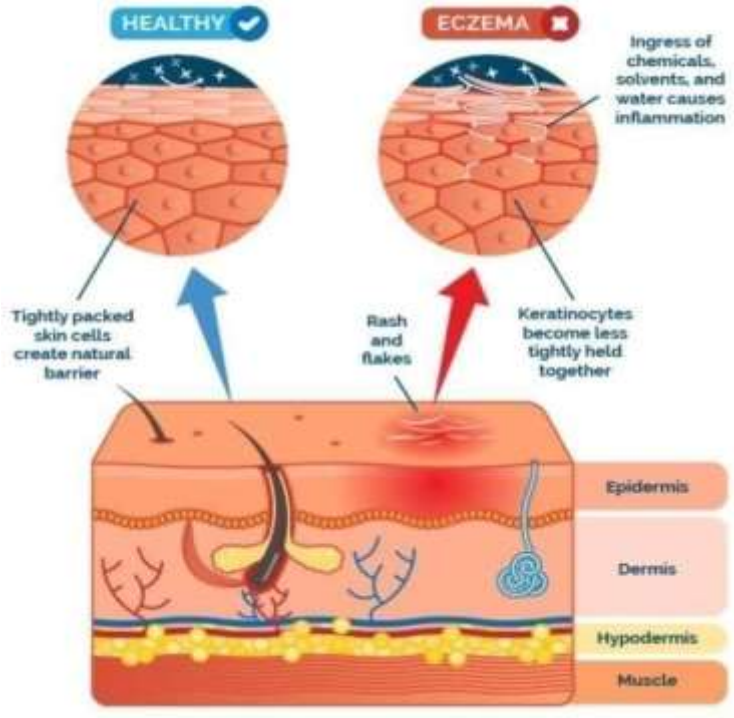


Figure 3:- Healthy and Eczema condition of skin

TREATMENT AND DIAGNOSIS

- **Treatment**
  1. **Topical Treatments**
     - Moisturizers: Importance in managing dryness.
     - Topical Corticosteroids: For inflammation control.
     - Topical Calcineurin Inhibitors: Alternatives to steroids**.**
  2. **Systemic Treatments**
     - Antihistamines: To relieve itching.
     - Immunosuppressants: (e.g., cyclosporine) for severe cases.
     - Biologic Therapies: (e.g., Dupilumab) for moderate to severe eczema.
  3. **Non-Pharmacological Approaches**
     - Lifestyle Modifications: Avoiding triggers, bathing practices.
     - Education and Support: Importance of patient education.
  4. **Phototherapy Types: Recommended for moderate to severe cases.**
     - Ultraviolet B (UVB)
     - Narrowband UVB therapy

- **Diagnosis**
  1. Clinical History: A thorough medical history is essential.
     - Personal history of skin conditions.
     - Triggers (e.g., allergens, irritants).
  2. Physical Examination: Dermatologists assess the skin's appearance, distribution, and severity of lesions.
  3. Allergy Testing: Skin prick tests or patch tests may be conducted to identify specific allergens that could trigger eczema.
  4. Laboratory Tests: While not routinely used, blood tests can measure levels of Immunoglobulin E (IgE), which may be elevated in individuals with eczema.

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AIM AND OBJECTIVE

- **Aim**

To develop a safe, effective and well-tolerated cream for the management of eczema that provides symptomatic relief and improve that overall health of the skin.

- **Objectives**

Skin barrier repair : repair and strengthen the skin barrier to prevent moisture loss and protect against irritants and allergens.
Anti-inflammatory actions :- reduce inflammation and soothe irritated skin to minimize flareups.
Symptoms Relief :- provides relief from itching ,redness, inflammation, and dryness associated with eczema.
Skin hydration :- restore and maintain skin hydration level to prevent dryness and Protect skin barrier function.

LITERATURE REVIEW

1) **Beena Gidwani (2010):** We studied the efficacy of an hearbel SEMISOLID FORMULATION, which has anti-inflammatory and antimicrobial properties, in the treatment of ECZEMA. The plant PSORALEA CORYLIFOLIA has been used in treatment of various skin disorders and the present research concluded that this plant could be effectively used for the treatment of ECZEMA.
2) **Leen Khanfer (2023):** The combination between plant extracts, ceramide, fenugreek oil nano formulas along with urea and shea butter to create a plant-based cream to treat eczema is considered to be successful and promising. MTT results showed a less cytotoxicity fir the nano particles than the free form. Quantification of inflammatory cytokine's release indicated a good ability for our formulas to inhibit the inflammation caused by eczema.
3) **C Hela, N Lunjani (2015**): Many patients depends on moisturisers issued by public health services in the management of atopic dermatitis (AD).
4) **Priyanka Joshi and Sushil Joshi (2021):** The aim of the present study is to evaluate the efficacy of selected polyherbal formulations against psoriasis-induced secondary infections. Psoriasis is one of the most common skin diseases in humans and affects a major population worldwide. The present study concluded that most of the formulated lotions and creams showed good antimicrobial activity and may be applied topically against scalp psoriasis.
5) **Malachi Oluwaseyi Israel (2014):** Shea butter is the fat extracted from the nut of Africa Shea tree (Vitellaria paradoxa). It is used in cosmetic formulations and as a substitute for Cocoa butter in chocolate industries. It is edible and used cooking fat in Africa. The saponifiable fraction of Shea butter is composed primarily of stearic and oleic acids with lesser amounts of palmitic, linoleic and arachidic acids while the unsaponifiable fraction of Shea butter's medicinal properties. Shea butter is a solid at room temperature and melts at body temperature. It is therefore useful for skin care as it has sun screening properties and acts as an emollient and skin moisturizer. Topical use if Shea butter has also demonstrated anti-aging and anti-inflammatory properties. Dietary intake of Shea butter has hypocholesterolemic effect and reduces serum and organ protein concentrations.
6) **Christen M Mowad (2000**): Parabens are the most common preservatives in use today. They are alkyl esters of p-hydroxybenzoic acid and are used extensively because they are relatively nonirritating and nontoxic and offer good antimicrobial coverage. Testing for paraben allergen can be done by patch testing.
7) **Tzu-Kai Lin, Lily Zhong, Juan Luis Santiago (2017**): Plants oils have been utilized for a variety of purposes throughout history, with their integration into foods, cosmetics, and pharmaceutical products. They are now being increasingly recognized for their effects on both skin diseases and the restoration of cutaneous homeostasis. This article briefly reviews the available data on biological influences of topical skin applications of some plant oils (olive oil, olive pomace oil, sunflower seed oil, coconut oil, safflower seed oil, argan oil, soyabean oil, peanut oil, sesame oil, avocado oil, borage oil, jojoba oil, oat oil, pomegranate seed oil, almond oil, bitter apricot oil, rose hip oil, German chamomile oil, and shea butter). Thus, it focuses on the therapeutic benefits of these plant oils according to their anti-inflammatory and antioxidant effects on the skin, promotion of wound healing and repair of skin barrier.

MATERIAL AND METHODS

INGREDIENTS

There are various ingredients used to manufacture eczema cream they are as follows ;

- Coconut oil
- Psoralea oil
- Shea butter
- Vitamin E capsule
- Rose water
- Methyl paraben

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- **COCONUT OIL**

Coconut oil: Coconut oil is extracted from the kernel or meat of mature coconuts harvested from the coconut palm (Cocos nucifera). Coconut is composed of many FFAs including lauric acid (49%), myristic acid (18%), palmitic acid (8%), caprylic acid (8%), capric acid (7%), oleic acid (6%), linoleic acid (2%), and stearic acid (2%). Coconut oil has been shown to be as effective and safe as mineral oil when applied as moisturizers mild to moderate xerosis.

All topical applications of virgin coconut oil were shown to be effective in decreasing the severity of the disease, ameliorating disease severity index (SCORAD). and improving barrier function (TEWL and skin capacitance). Topical applications of virgin coconut oil are effective in promoting WH through faster epithelization.

Topical coconut oil protects the skin from UV radiation. Of all the acid components of coconut oil, monolaurin has been shown to have additional significance. Monolaurin is a monoglyceride derived from lauric acid. It comprises nearly 50% of coconut's fat content. Monolaurin displays antimicrobial activity by disintegrating the lipid membrane of lipid-coated bacteria including Propionibacterium acnes, Staphylococcus aureus, and Staphylococcus epidermidis



- **PSORALEA OIL**

Traditionally in India and China, Psoralia corylifolia seed decoction used for treating psoriasis. It is an ethanolic extract of Psoralia corylifolia seeds were analyzed by high performance thin layer chromatography (HPTLC). Psoralia corylifolia Linn (Fabaceae) is an annual herb with broadly elliptic leaves, yellowish or bluish purple flowers and compressed, mucronate, dark chocolate to almost black coloured seeds generally found traditionally in India and China.

Psoralia corylifolia has been used for the treatment of stomachic,deobstruent,anthelmintic, diuretic, vitiligo and also certain skin diseases, such as leucoderma, psoriasis and leprosy. Psoralia corylifolia contains psoralens which are capable of absorbing radiant energy. In ultraviolet range Photo- activation by Psoralens with (200–320nm) is known to ameliorate various skin disorders such as psoriasis, vitiligo and mycosis fungicides in humans.



- **SHEA BUTTER**

Shea butter is a proven moisturizer for your skin. Shea butter has soothing and anti-aging properties that may make skin appear smoother and reduce aging. Its also works as an emollient that softens and hydrates skin. Because it contains several types of fatty acids including lineoleic, oleic, palmitic and stearic acids — that improve the skin's natural barrier.

Shea butter also protects skin from damage from the environment like pollutants. shea butter also contains quite a few antioxidants, including vitamins A and E, along with many of the same ones found in green tea and also known antioxidant powerhouse. Shea butter is known to have moisturizing and skin-healing properties that can help improve the appearance of hyperpigmentation. It contains vitamins A and E, as well as essential fatty acids, which are beneficial for the skin.

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These vitamins and essential fatty acids help to protect the skin from damage, nourish the skin, and promote skin cell turnover. This can help to improve the appearance of hyperpigmentation over time. Shea butter is a type of fat that is extracted from the nut of the African shea tree (Vitellaria paradoxa). It is commonly used in cosmetics and personal care products for its moisturizing and skin- healing properties.



- **VITAMIN E CAPSULE**

Vitamin E has been considered an anti-inflammatory agent in the skin, as several studies have supported its prevention. Topical vitamin E can reduce UV-induced skin swelling, skin thickness, erythema, and edema. It also helps make the skin nourished, hydrated, and more radiant.

Vitamin E capsules can help with eczema by reducing inflammation and providing relief from symptoms:-

Anti-inflammatory: Vitamin E can help reduce redness and swelling caused by inflammation, which is a common cause of eczema.

Antioxidant: Vitamin E can protect the skin from damage caused by free radicals.
Hydrating:Vitamin E can help the skin absob and retain water.



- **ROSE WATER**

water is a great anti-inflammatory, which is good for reducing acne, rosacea, eczema, dermatitis, skin redness, and psoriasis. Rose water can help with eczema because of its anti-inflammatory properties, which can soothe irritation and itchiness and Soothes skin. Rose water can calm skin irritation and redness from eczema and other skin conditions. Rose water can moisturize and refresh the skin, which can help with dry or sensitive skin.

Rose water's antiseptic properties can help heal cuts, burns, and scars. Vitamin E can help the skin absorb and retain water.

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- **METHYL PARABEN**

Methylparabens are a type of chemical that manufacturers often use as a preservative. People can add them to food, cosmetics, and pharmaceuticals to increase shelf life and avMethylparabens are a type of chemical that manufacturers often use as a preservative. People can add them to food, cosmetics, and pharmaceuticals to increase shelf life and avoid bacterial and fungal growth.



FORMULATION TABLE

SR. NO	INGREDIENT	QUANTITY TAKEN
1	Coconut Oil	15ml
2	Psoralea Oil	10 ml
3	Shea Butter	12gm
4	Vitamin E Capsule	2 capsules
5	Rose Water	1ml
6	Methyl Paraben	0.5 gm

❖ **EVALUATION PARAMETERS**

1. **Appearance** – Color, Texture, And Homogeneity
2. **Ph** – Skin-Friendly (4.5–6.5)
3. **Viscosity** – Consistency Check
4. **Spreadability** – Ease Of Application
5. **Stability** – Under Various Conditions
6. **Drug Content** – Active Ingredient %
7. **In-Vitro Drug Release** – Release Rate
8. **Skin Irritation Test** – Safety Check
9. **Microbial Test** – Absence Of Contamination
10. **Moisturizing Effect** – Hydration Ability

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CONCLUSION

The Eczema Cream is a pharmaceutical preparation used for the treatment of eczema . "Eczema " is a type of condition that causes skin inflammation. It is a viscous or semisolid preparation which is intended for external application to the skin.

The preperation is either O/W or W/O type. The eczema cream has a potential anti itching activity. The eczema cream used for the relief from itching and rashes. The cream is also used to treat dry,scaly patches of skin, redness , itching and infection.

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