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PHARMACEUTICAL CREAMS – A REVIEW

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ABSTRACT:

Pharmaceutical creams are the topically applied pharmaceutical products, either as medicated or non-medicated. This review focuses on the advantages, disadvantages, types, applications, classification, preparation methods, evaluation and formulation of cream. Not only cleansing, beautifying, and moisturizing, it also serves for medicinal purpose such as wound healing, protecting the skin against harshness from the environment help to relieve dryness, maintaining skin softness and also maintain the hydration of skin. Creams are mostly used as cosmetic products for texture against fungal and bacterial infection treating burns etc. Creams are evaluated for pH, viscosity, spreadability, appearance, acid value, etc.

KEYWORDS: Creams, make-up cream, fusion method, dye test.

INTRODUCTION

The term dosage forms refers to the means by which drug molecules/APIs are delivered to sites of action within the body to produce optimum desired effects with minimum adverse effects. There are different types of dosage form such as solid, semi-solid, liquid, gaseous. Semisolid dosage form includes ointment, gel, cream and pastes. Which are applied to the skin. Skin is the protective layer of the body, which is usually soft and protects it from external elements. An injury to part of the body, especially one in which a hole is made in the skin using a weapon

The word cosmetic is derived from the Greek word 'cosmetics' meaning decorates. Cosmetics are used to enhance the appearance. Cosmetics is actually derived from its use in ancient era. They produced by female slaves known as the 'cosmetic' derived from 'cosmetics'. The increased cosmetics using peoples stay young and attractive creams are topical preparation to be applied on the skin. Cosmetics are available in the form of creams, lipstick etc. Cosmetics used by many women of all ages. Cosmetics are used daily by both women and men such as creams, gels, cleansing cream is a type of cleanser that is specifically designed to remove make up and impurities from the skin along with moisturizing and nourishing. Cosmetic creams work as a skin moisturizer for dry, dry and cracked skin. It basically softens and removes unwanted impurities from the skin[1].

Pharmaceutical ingredients are used to treat fungal skin infections. It removes unwanted impurities present in the skin. It is also regarded as a vital component of cosmetics the organoleptic medicated cream properties include good viscosity and colour. The cosmetics are important enhance the self-confidence. Cosmetic creams such as sunscreens protects the skin from sun rays. Medicated creams are used for wound healing. The ginger extract is used in the treatment of antifungal infection[2]. The creams are easy to applying the skin.

Fig 1: Pharmaceutical Creams.

ADVANTAGES

- It is simple and easy to use.
- It avoids first pass metabolism.
- It can be used in those drugs that require very little plasma concentration to be effective.
- It helps the skin to keep hydrate and soften[3].
- It is easy to spread and absorb into the skin.
- Creams can be formulated based on various skin types.

DISADVANTAGES

- It have poor permeability of some drugs through the skin.
- It causes redness, itching or allergic reactions to some patients[4].
- Creams may not be suitable for patients with sensitive skin.
- High quality creams can be expensive.
- Enzyme in epidermis may denature the drugs.
- Drugs with larger particle size are not easily absorbed into the skin.

APPLICATIONS

- It is used to treatment of skin conditions like eczema, acne[5].
- It is used to skin repair.
- It is used to softening dry skin.
- It provides sun protection[6].
- Reduces inflammation.
- Improved skin tone, appearance.
- Reduces fine lines, wrinkles and age spots.
- It is used to treat irritating or inflamed skin.
- Protection from environmental pollution.
- Enhances skin elasticity.
- It is used to treat skin itching or dermatitis.
- It improve the appearance of skin.
- Creams can be used on various part of the body including face, hands, feet and more.
- Reduces dark circles.

TYPE OF SKIN CREAMS

- Oil- in- water cream
- Water-in- oil cream
- Oil-in-water (o/w) cream:
- o/w creams are made up of minute droplets. Oil spread in a continuous phase, and an o/w emulsion in which the oil is dispersed as droplets throughout the aqueous phase[7].
- Water -in-oil (w/o) cream:

w/o creams are made up of minute water droplets suspended in a continuous oily phase. The emulsion is water-in-oil (w/o) type, where water is the continuous phase & oil is dispersed medium.

IDEAL CHARACTERS

- It should improve skin's texture.
- It should be non-sticky and non-greasy[8].
- Clinically proven UV filters.
- It should melt at body temperature.
- It should spread freely across skin when applied.
- The cream should allow ingredients to get absorbed into the skin, delivering the desired effect[9].
- It should not produce undesirable effect like skin itching, rashes or redness.

CLASSIFICATION OF CREAMS

Skin creams can be classified on different basis[10]:

1] **ACCORDING TO FUNCTION:**

1. MAKE-UP-CREAM:

These are mainly o/w type of emulsion. It is cream based product which leaves a smooth hydrated finish on the skin. It nourishes skin and is basically sweat-resistant and creates a dewy glow. There are two types;

a) **Vanishing creams:** They are called vanishing creams since they begins to disappear when applied to the skin. Stearic acid is used in these composition. After application, the cream leaves a dry but tacky residual film that also have a drying effect on the skin. Because of this reason, these are mainly used in hot areas that cause sweating on the skin[11].

b) **Foundation creams**: These cream serve as a foundation base for make-up. It act as an adherent base for application of make-up powders. They provide emollient action and a protective action against environment to the skin which is neither too greasy nor too dry. It is multi- coloured make up applied on the face to create an even uniform colour similar to the complexion, to cover flaws and to change the skin tone[12].

2. CLEANSING CREAM:

Cleansing creams are used for body cleaning purposes and it is used for personal hygiene and beatification which is important of cosmetics. Cleansing creams or lotions can be used to

remove make up, surface grim, oils mainly from the face and neck. E.g. cleansing milk, cleansing lotion[13].

1. WINTER CREAM: (w/o emulsion)

These are w/o type of formulation and in this formulation oil content will be more than water content. These creams are mainly used for cracked and dry skin.

E.g. Cold cream: It is known as moisturizer or moisturizing cream. Cold cream should have an emollient action. It should produce a cooling sensor used the oil film on the skin should not be covered.

2. ALL PURPOSE CREAMS AND GENERAL CREAMS:

These creams are used more nowadays than before. These creams can spread on the skin easily. This can also be used as a night cream, nourishing cream, protective cream to prevent or reduce sunburn or to treat sensitive skin areas[14].

3. NIGHT CREAM OR MASSAGE CREAMS:

These creams are mainly used for the nourishing the skin or as a treatment of dry skin. They creams are applied to the skin and left for a few hours over night. The creams act as and emollient by applying the cream on the skin with massage known as a massage cream.

4. SKIN PROTECTIVE CREAMS:

These creams are smooth, thick creams formulated to provide an invisible, uniform protective film barrier to the skin. It strengthens the natural features of the skin and maintains the balance of normal and combination skin[15].

5. HAND CREAMS:

Wrinkles are one of the first sings of aging. Applying cream softens and protects the skin and keeps the skin looking younger. The skin on the palms and the fingers needs oil to stay soft and can protect from chapping and cracking. Oil present in the cream serves as a nourished.

FORMULATION OF CREAMS

Emulsifier:

It is a substance that helps two liquids that don't normally mix, like oil and water, to combine form a stable mixture is called emulsion[16].

E.g., Cetyl alcohol, glycerol stearate, polysorbate 20, lecithin

Emollient:

It helps to soften and smooth the skin blend oil and water - based ingredients, and improve product texture.

E.g., Petroleum jelly, squalling, lanolin, stearic acid, white beeswax, cetyl alcohol

Colours:

Colours were mainly derived from natural ingredients. They also could be produced without using plants harvested in the wild[17].

E.g. Zinc oxide, iron oxides, Titanium dioxide, lakes, phthalate blue & Quinacriolone pigments

Humectants:

These are important multi-functional ingredients found in many skin care products. Humectants are hydroscopic organic compounds. These are substance that can absorb or retain moisture[18].

E.g., Glycerin, hydroxyethyl- urea, betain, sodium PCA, sodium L - lactase, sorbitol, propylene glycol

Perfumes:

"Skin scents" and traditional fragrances.

E.g., Rose oil, lavender oil, chamomile oil, sandal wood oil, vanilla, lemon

Preservative:

They prevent the growth of microorganism.

E.g., phenyl ethanol, methyl paraben, propylparaben, sodium benzoate, benzyl alcohol, potassium sorbate

Vehicles:

It act a solvent for other ingredients and helping to form emulsion like creams and lotions.

E.g., Water, Glycerin

METHODS OF PREPARATIONS:

❖ **Fusion method:**

The fusion method is followed when the drug and other semisolid base. The base is liquefied and the soluble components are dissolved in the molten base. The congeal mixture is then speculated or triturated to obtain a smooth texture. Care is taken to avoid thermal degradation of the base or other components during the fusion process[19].

❖ **Trituration method:**

Used for finely divided insoluble powder particles or liquids. Insoluble powders are added by geometric dilution. Liquids are added by making well in centre. Air pocket formation

avoided. Mortar and pestle used when we have large quantities. Involved use of glass slab when small quantities are used[20].

❖ **Levigation:**

Incorporation of insoluble coarse particles. Insoluble coarse powder is rubbed with molten base or liquid or semisolid base.

EVALUATION PARAMETERS OF CREAMS:

Determination of PH:

The PH can be determined at room temperature using a standard digital PH meter and an appropriate amount of the formulation diluted with a suitable solvent in a suitable beaker. The normal PH range of cream is 5.6 to 6.8 which is suitable with skin pH[21].

Viscosity:

The viscosity of the formulated creams can be determined using the Brookfield viscometer at the temperature of 25°c using spindle no. 63 at rpm[22].

Spreadability test:

A sufficient amount of sample is taken between two glass slides and a weight of 100g is applied to the slides for 5 minutes.

$s = mx .1/t$

Less the time taken for separation of two slides results showed better spread ability. The value should be in between 9.0 to 31.02 g.cm/s.

Dye test:

The cream is combined with the scarlet dye. Put a drop of cream on a slide, cover it with a cover slip, than look at it under a microscope. It's an o/w type of cream the dispersion globule is red & the ground is white and a w/o type of cream if the disperse globules is white and the ground is red[23].

Physical appearance:

The physical appearance of the cream can be distinguished by its, colour, odour roughness and consistency.

Acid value test:

Take 10g dissolved in 50 ml of a precisely weighed mixture of equal amounts of alcohol and solvent ether. The flask is than attached to a condenser and slowly heated to reflux until the sample is completely dissolved. Then add 1 ml of phenolphthalein and titrate with 0.1N

NAOH until a pale pink colour appears after shaking for 30 seconds. The normal acceptable acid value ranges between 9.5 -11.2[24].

Saponification value test:

About 2 mg of substance refluxed with 25 ml of 0.5 N alcoholic KOH for 30 minutes, to this 1 ml of phenolphthalein added and titrated immediately with 0.5N HCl.

Saponification value= (b-a)* 28.05/w

where,

a - volume of the titrant in ml

b - volume of the titrate in ml

c - weight of the substance in g

The saponification value ranges 23.4 - 26.7

Removal test:

The treated area should be washed with tap water in order to determine how easily the creams could be removed.

Homogeneity:

The structure was tested for similarity in physics appearance and touch[25].

After feel test:

Check for emolliency, smoothness and amount of residual residue after application of limited amount of cream.

MARKETED FORMULATIONS:

Some of the pharmaceutical creams available in market are given in the following table-1:

Table: 1 Marketed Formulations of Pharmaceutical creams.

S. No.	Pharmaceutical Cream	Manufacturer	Application
1.	Tecderm plus cream	Curetech	Anti-bacterial activity
2.	Onexa cream	Sonixa Lifecare	Anti-bacterial activity
3.	Swissderm cream	Swisschem Dermacare	Anti-bacterial activity
4.	ETRAZO-OC cream	Nova Indus Pharmaceuticals	To treat Skin Infection
5.	Laviderm cream	Lavish Biotech	To treat Itching and Irritation
6.	Dermivel cream	BIOSYNC	To treat Itching and Irritation
7.	Acivir cream	Cipla	To treat Itching and Irritation
8.	Luliact cream	Leeford	Anti-fungal activity
9.	Acnetop cream	Healing Pharma	Anti-acne, pimples
10.	Derbeaiu-6% cream	Healing Pharma	Remove dead skin, dark spots, and pigmentation

CONCLUSION:

Creams are the semisolid preparation used for the topical application. As compared to other dosage form semisolid preparation have certain advantages including, it avoids first pass metabolism, less chances of side effects which of upholds the limitation of having poor permeability of some drugs through the skin. Creams should possess ideal characters like melting at body temperature, spreading freely across skin and non- sticking in nature are classified based on function, characteristics properties. The nature or type of emulsion. Creams are prepared by fusion method, trituration method and levitation method. Formulation of creams requires emulsifier, emollient, colours, humectants, perfumes, preservations, vehicles. Creams are evaluated by determination of pH, viscosity, spreadability test, dye test, physical appearance, acid value test, saponification value test, removal test, homogeneity, after feel test, among the conventional dosage form creams promises a better delivery of the pharmaceutical with easy of manufacture.

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