



A Review on Topical GEL Formulation for Psoriasis Treatment

Khushi Padiyar; Arpit Gawshinde; Komal Tikariya;
Umesh Ateriya; Dr. Dharmendra Solanki

BM College of Pharmaceutical Education and Research Indore, M.P (India)

DOI: 10.47760/ijpsm.2023.v08i10.001

Abstract: According to the research Psoriasis disease is widely show in human at recent now, this is a long term disease it is triggered by the genetic issue, bad habit such as smoking, drinking, drug addiction etc. and some long term medication, insect bite etc. it can be affecting adult, child or old age people also. Now days latest research we have lot of option in drug or dosage form. In the topical dosage form GEL dosage form is the best option because of their application or improves patient compliance. It is big option for those drugs who had a problem with solubility with the dosage form. In the gel any drug can be easily incorporated. GEL can be easily applied or removed from skin by the single wash, there no extra effort need to rub on skin as compare other dosage form only just make single thin layer of skin. It also the problem with children dosing. Drug can be shows better effect on penetration on skin, and also increase bioavailability of drug. There is no adverse effect or using humectant cool the skin and relief from pain and itchy dry skin.

1. Introduction

Psoriasis is genetic disease that come from old affected gene. It will be triggered by some medication, atmosphere, alcohol- smoking, insect bite. In this disease symptoms are topically itchy, dry scalp skin. And the mostly affected area of body is knee, elbow, legs lower back portion, scalp, finger, near genital part. This is long term disease, their cure for need long term treatment. There is a psoriasis characterized.

* **Plaque psoriasis** - this is common type of psoriasis in this the symptoms are usually red patchy skin, silver scalp on skin at knee, elbow, leg, face etc.

* **Nailed psoriasis** – in this type symptoms are abnormal growth of nails discoloration of nail and scalp or dry formation of nail.

* **Inverse Psoriasis** – the mostly affecting area is skin folds, breasts, buttocks. The causes are smooth patches of red skin that inflame with friction or sweating. Fungal infection can also be triggered by this type of psoriasis.

* **Pustular Psoriasis:** This is rare form of psoriasis and clearly by the name in this case



the pus-filled lesion inside the widespread patch or in smaller area of the palms of the hand and the soles of the feet.

If the person has psoriasis, then may be chances to lead a stiffness, joint pain, stress, obesity, CVD, mentally disturbance.

Treatment of Psoriasis – the psoriasis diseases are cure by the some injectable, topical, oral, light therapy is type of treatment.

A) Oral dosage form -

Treatment by the oral medication is pills, tablet, capsules, syrup are included

Oral dosage form usually uses some anti- allergic, anti-fungal or other drug. Included drug are Steroid, Retinoid, Methotrexate, Cyclosporine.

B) Light Therapy – moderate to severe treatment usually used the light therapy in this therapy commonly used Sunlight, UVB, broadband, UVB narrowband, Psoralen plus ultraviolet A, (PUVA), Excimer laser.

C) Topical dosage form – there is a large number of options available in this dosage form, such as Lotion, Cream, Gel, Emulgel, Solution, Ointment, Suspension.

Normally used to treatment of psoriasis the drug in topical dosage form is Corticosteroid [Halobetasol Propionate], Retinoids, Vitamin D analogue, Calcineurin inhibitors, Salicylic acid, Coat tar. Topical dosage form is best for the any skin treatment, it can be easily applied on local skin, easily removable, better result, avoid fast pass metabolism.

Gel is semi solid dosage form that use to topical treatment. Gel is Small or large inorganic particle enclosed interrupted by water. Gel is made up of synthetic or natural polymer that forming a three-dimensional matrix in dispersion medium and hydrophilic liquid. There is three main functions of gel

Hydrate the skin because of emollient property, direct deliver medication on skin, work for heal or relief on injured part of skin and it is also protected from the external environment.

Gel forming agent-

a) Natural Polymers. -

*Proteins – Xanthin, Gelatin, Gellum Gum.

*Polysaccharides – Agar, Alginic acid, Tragacanth, Pectin, Guar Gum, Cassia Tora

b) Semisynthetic Polymers. -

*Cellulose Derivatives –, Methylcellulose, Hydroxypropyl cellulose, CMC,

Hydroxypropylmethylcellulose,

c) Synthetic Polymers. -

*Carbomer – E.g., Carbopol -940, Carbopol-934, Carbopol-941

*Poloxamer



*Polyacrylamide

*Polyvinyl Alcohol

*Polyethylene and its copolymer

d) **Inorganic Substances.** – E.g., AluminumHydroxide, bentonite,

Advantages of topical Gel administration-

- It is avoiding the gestational fluid effect on drug, pH stability, drug interaction with food and fluid (Drink).
- This is easily applicable that for easy to compare with injectable dosage form,
- Avoid their relative problem, vomiting, pain.
- Improve the patient Compliance for children dosing
- It is also reducing oral dosage due to avoid fast pass metabolism,
- Enhance the bioavailability of drug withthe dosage form
- Avoid the drug adverse effect like bittertest, GI fluid pH.
- It is very easily to apply or removable ascompare to other topical dosage form such as cream or ointment.

Characteristics of Gels-

- Gelling agent are should be pharmaceutically or cosmetically safe or inert and non-reactive with the excipients
 - it should be non-sticky or sterile for ophthalmic preparation.
 - possess for anti-microbial property.
- Formulation design Topical gel may includethe following components:

- a) Gel forming agent or polymer.
- b) Drug Substance.
- c) Penetration Enhancers.

2. Evaluation parameters.

- I. Viscosity** -Viscosity is measure by the help of Brookfield rotational viscometer.
- II. Drug content** -API form is extracted by the help of appropriate solvent in a gel, and measure the conc. Of the API on at. λ_{max} nm on the uv spectroscopy method. And solvent is black reagents
- III. Physical Examinations-** By physically visualization measure texture, color, homogeneity, consistencies.
- IV. pH value-** pH value will be measured by the help of pH meter (digital).
- V. Spread ability measurement-** 0.5 gm of microemulgel drop in the glassand measure the area in 1cm. Diameter marked on the glass and then drop 5 gm or microemulgel in glass and measure



Khushi Padiyar *et al*, International Journal of Pharmaceutical Sciences and Medicine (IJPSM),
Vol.8 Issue. 10, October- 2023, pg. 1-4

ISSN: 2519-9889
Impact Factor: 5.9

the diameter after the 5 min and calculate in a gm-cm/sec equation.

- VI. Skin irritation-** by the help of mice. Take 5-7 shaven skin mice and apply 1mg. approx gel on skin and spread it. 3 hr. after applied gel examine that part of skin as compare or check the mice activity. Same procedure repeats at least 15-30 day on same mice skin and examine the skin nature color, if no any redness or dry itchy skin found that mean gel has nonirritant with the drug or using excipients.
- VII. *In vitro* Release study** – Set assembly Franz diffusion cell, apply the gel on skin membrane and take a sample of phosphate buffer at the starting point and check the drug% by the help of UV spectroscope. And after then every 30 min. take the reading till the 90-100% of drug
- 3. Conclusion** – In the condition of psoriasis all the dosage form such as oral topical or some parenteral dosage form, there is gel dosage form is best for the patients because of easily applicable no extra afford for rubbing, it is cost effective no extra instrument use for manufacture. Reduce dose drug because of extra penetration, relief from itchy dry scalp skin due to psoriasis using humectant. Using natural polymer can help to make low side effect with the dosage form. No more extra side effect.

References

- [1]. Anderson P.H., (1997), Reflectance spectroscopic analysis of selected experimental dermatological models. *Skin Research and Technology*, 3:8–15.
- [2]. Anderson R.R., Parrish J.A. (1981), The optics of human skin, *Journal of Investigative Dermatology*, 77:13–19.
- [3]. Anderson R.R., Parrish J.A. (1982), The science of photomedicine Chapter 6: Optical properties of human skin. Plenum Press.
- [4]. Awad N., Preuss C.V., (2021), Halobetasol Cream.
- [5]. Alberts B., Bray D., Johnson A., Lewis J., (1998), *Essential Cell Biology* p601. Garland.
- [6]. Aromatherapy, (2020), *Natural Medicines*, Accessed.
- [7]. Ashara, K.C., Paun, J.S., Soniwala, M.M., Chavda, J.R., Mendapara, V.P., Mori, (2014) N.M., Microemulgel an overwhelming approach to improve therapeutic action of drug moiety, *Saudi Pharmaceutical Journal*,
- [8]. Bagel J., Thibodeaux G.Q., Han G, (2020), Halobetasol propionate for the management of psoriasis
- [9]. Feldman S.R., (2020), Treatment of psoriasis in adults, Accessed March 16
- [10]. Higgins, (2017) page 368 -378 psoriasis. 2 Volume 45 issue 6.
- [11]. Henning W., Micheal B., Schon P., (1997), page no 983-5.
- [12]. Khademhosseini K., Demirci U., (2016), *Gels Handbook: Fundamentals, Properties and Applications*, World Scientific Pub Co Inc
- [13]. Kshirsagar N. A. (2000), *Drug Delivery Systems*, Ind. J. Pharmacology, 32, S54- S61.
- [14]. Kermott C.A., (2017). Psoriasis. In: *Mayo Clinic Book of Home Remedies*. 2nd ed. Time.