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FORMULATION AND EVALUATION VORICONAZOLE OINTMENT TO TREAT DERMATOPHYTOSIS

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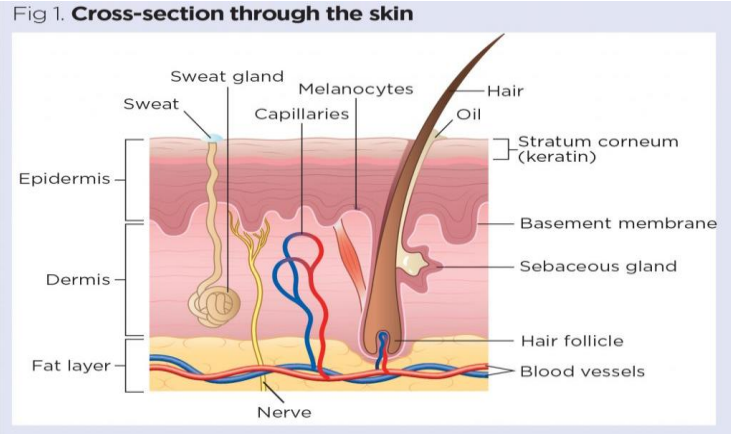
1) ABSTRACT

Voriconazole is a antifungal drug which Comes under the triazole group. Voriconazole is mainly used to treat encroaching or invasive fungal infection including aspergillosis, candidiasis, for the certain emerging fungal infections, penicilliosis and Coccidioidomycosis. The studies of voriconazole ointment were conducted with an aim to find or to develop out a desired ointment formulation for treatment of tungal infection like dermatophytosis (ring worms). The purpose of this study is to formulate the voriconazole ointment with different ointment bases having good diffusion, antiseptic & antifungal properties, & also the consistency. To assess the effecacy of formulation assay, viscosity, spreadability, Stability, permeability through the skil diffusion & other physical characteristics were can be evaluated. The formulation of the ointment was done by preparing the ointment base and incorporating the active ingredients in the accurate ratio into the base by fusion method to give the effective therapeutic action. PEG ointments were prepared with changing or altering the type of the liquid PEG (low molecular weight). Then, the Action of the voriconazole release from the formulation was studied.

KEYWORDS: Voriconazole, ointment, PEG (polyethylene glycol), Antifungul action.

2) INTRODUCTION

Topical drug delivery is a route of administering drugs via the skin to provide topical therapeutic effects. As skin is one of the largest and most superficial organs in the human body, pharmacists utilise it to deliver various drugs. This system usually provides a local effect on certain positions of the body. Topical administration is the route by which the active agent is administered on the skin and mucous membrane for the local or systemic action.



Dermatophytosis

Dermatophytosis is also called the Ringworm. Another names for the ringworm are tinea captitis, tinea corporis and tinea.

Dermatophytosis (ringworm) is contagious fungal infection that causes the ring like pattern on the skin. For the treatment of dermatophytosis there is requirement of antifungal drug like voriconazole.

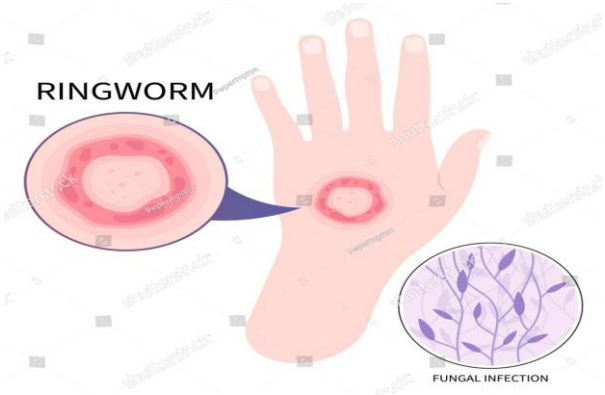
Voriconazole is antifungal drug which comes under the triazole group and mainly used for the fungal infection like dermatophytosis.

Voriconazole ointment is the formulation which comes under the topical formulation that gives the more effective action for treatment of dermatophytosis. It comes under the semisolid dosage form which contains the volatiles and water, hydrocarbons, polyethylene glycol as the vehicle for external use on the skin.

Advantages of topical drug delivery system

- Avoid first pass metabolism.
- gives site of action for skin disease.

- easy to administer .
- reduce the loss of adequate amount of drug.
- reduce the adverse drug reaction.
- Provide patient complainance.
- Maintain drug level in blood.
- Removal process of medication is easy. If needed.



Factors affecting skin absorption

- Physical condition of the skin

- solubility of substance

- Duration of contact

- Molecular weight of the molecules

- concentration

- Lipophilicity of the drug

Dermal dosage forms

Creams, lotion, ointment, aerosol, transdermal patches, liniments, gels and solutions.

OINTMENTS

Ointments are greasy semisolid medicated preparation which is applied topically on the skin. Ointment are applied on the skin to heal wounds, scrapes, rashes and for other skin problems. Ointments are oil based preparation with a vehicle.

There are two types of ointments which are as

1) Medicated ointment

2) Unmedicated ointment

Medicated ointment are mainly used for the treatment of fungal infections and also for the inflammation. Due to the emollient or lubricationg properties, the medicated ointment are mainly used.

Types of ointment Bases

Ointment base is mixture of oils a Semisolid, viscous, Fats and hydrocarbons that used in the preparation of ointments. Ointment bases used are as follows

1) Absorption Base

It is used as emollient.

Eg: beeswax, wool fat, unhydrous lanolin.

2) Oliginous Base

It is used for hydrophobic drugs in corporation.

Eg: Glycerol, petrolium, mineral oil.

3) water Sotuble bases

These are work as drug carier.

E.g.: Polyethylene glycol, Propylene glycol.

4] Emulsifying bases

E.g.: vegetable oil like olive oil, almond oil, peanut oil.

LITERATURE REVIEW: 01

Formulation development and evaluation of voriconazole sustained release tablets Aulton, ME. (2002). Pharmaceutics-The science of dosage form design, 2nd ed., Churchill Livingstone, London. pp. 322-334.Rangasamy et al., Internationl journal of pharmacy and pharmaceutical sciences.

AIM: Formulation development and evaluation of voriconazole sustained release tablets.

BACKGROUND: For the treatment of invasive aspergillosis and other fungal infections like dermatophytosis, the voriconazole drug is approved.

OBJECTIVE: the present study was to formulate Voriconazole sustained release tablets by wet granulation method by using natural (Xanthan gum, Karaya gum) and semi synthetic polymers (HPMC K100M).

METHODOLOGY: The formulated tablets were evaluated for physical characteristics of sustained release tablets such as thickness, hardness, friability, weight variation and drug content.

RESULT: In the present study 10 formulations of Voriconazole matrix tablets with variable concentration of polymer were prepared and evaluated for Physicochemical, in vitro drug release studies.

CONCLUSION

Sustained release matrix tablets Voriconazole was formulated by wet granulation technique using the combination of natural polymers Xanthan gum, Karaya gum and semi d semi synthetic polymer IPMC K100M, Infrared spectra of the dr Brug along with polymers reveal that there is no significant interaction between drug and polymers. Preformulation studies were done ratially and the results were found within the limits. The evaluation tests results found to be within Pharmacopoeial specifications, From metru dissolution study it was concluded.

LITERATURE REVIEW: 02

Nitin Merubhai Mori, Priya Patel, Navin R. Sheth, Lalji V. Rathod, Kalpesh Chhotalal Ashara, Fabrication and characterization of film-forming voriconazole transdermal spray for the treatment of fungal infection, Bulletin of Faculty of Pharmacy, Cairo University.

AIM: Fabrication and characterization of film forming voricoazole transdermal spray for the treatment of fungal infection.

BACKGROUND: Invasive fungal infection are mainly occurred in immunocompromised patients. Voriconazole drug therapy for treatment of fungal infections is effective.

OBJECTIVE: Therapeutic drug levels were associated with developed clinical outcomes mainly in particular hepatoxicity and neurotoxicity patients.

METHODOLOGY: We performed electronic chart review of all patients included in our study. European organizations has study the guidelines which are based on the invasive fungal infections. From that outcomes are positive. In that route of drug administration, frequency of dose, timing of TOM, clinical outcomes in all patients are studied and recorded.

RESULT: A total of 108 patients had voriconazole TDM performed, In that 84 patients had hematologic malignancy, 47 patients had hematopoietic stem cell transplantation. Of the 46 patients with proven or probable invasive fungal disease, 25 (54.3%) achieved partial or complete response to therapy.

CONCLUSION

Voriconazole therapeutic drug levels were not associated with improvement in clinical outcomes among patients with proven or probable invasive fungal disease. We also did not find an association between supratherapeutic drug levels and hepatoxicity or encephalopathy. It is possible that the utility of voriconazole therapeutic drug monitoring toimprove clinical efficacy or decrease adverse events may be limited to a subset of high-risk patients.

3) Method of preparation

3.1. Fusion method

Ointment containing wool alcohol, emulsified waxes, bees waxes and hard Parafin are formulated by melting all ingredients in Porcelain dish on water bath. In this process the substance having high melting point should melted first and then add remaining ingredients in the bases in order to their melting points.

3.2. Trituration method

It is widely used method

It is used when base is soft and medicaments are available in solid insoluble form. Then small amount of liquid vehicle is incorporated in base.

In this first, solid medicaments are converted into fine powder and then this medicaments is mixed with small amount of base with continuous stirring with the help of spatula on water bath until the homogenous product is formed.

Fig. Vorichinazole Gel.

4. Evaluation of ointment

4.1 physical appearance

The formulated ointment can be inspected by its colour, consistency & homogeneity.

Ointment is a white viscous semisolid dosage form which can be examine by visual appearance.

4.2 Determination of PH

The PH of ointment can be determined by using the PH meter. The measurment of PH of ointment can be done by dipping glass electrodes into ointment solution by using digital PH meter. In this few amount of sample of ointment is mixed with water in the dry beaker.

4.3. Spreadability

The spreadability is can be calculated by using the formula

$$S = M. L /T$$

Where, M = weight tied to upper slide.

L = Length of glass slide

T = Time taken to separate the slides.

In this small amount of ointment are taken and placed between two slides under the direction of certain load.

If time taken for separation of two slides is low then spreadability of ointment is good.

4.4 Measurement of viscosity

For the measurement of viscosity of ointment we can use the viscometer or rheometer. In this viscometer a spindal is used to measure the viscosity.

The spindal rotate faster then viscosity will be low. If spindal rotate slower then high will be the viscosity.

4.5 Etrudability

Extrudability of ointment can be measured by using the texture analyser. It is test in which we measure the force required for extrude the ointment material from the tube.

The formula for the extrudability test is:

Extrudability = amount of ointment extruded from the tube × 100 / total amount of ointment filled in the tub

5. RESULTS AND DISCUSSION

Drug polymer interaction was studied using the IR spectrum. The Fourier transform (FT)-IR spectra of the pure drug and the mixture of drug and polymers. From the spectral study, it was observed that there was no significant change in the peaks of pure drug and of drug polymer mixture.

Therefore, Drug and polymer used in the ointment formulation do not show any specific interaction.

6. CONCLUSION

According to literature survey, It can been concluded that voriconazole ointment can treat fungal infection like dermatophytosis (ringworm). Voriconazole ointment gives effective action and also hepls to increase the bioavailability of drug.

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