OPEN ACCESS

Saudi Journal of Medical and Pharmaceutical Sciences
Abbreviated Key Title: Saudi J Med Pharm Sci
ISSN 2413-4929 (Print) | ISSN 2413-4910 (Online)
Scholars Middle East Publishers, Dubai, United Arab Emirates
Journal homepage: https://saudijournals.com

Review Article **Pharmacy Practice**

A Concise Review on Skin Disorders

Aditi Sajwan[1], Ayushi Belwal[1], Nitin Sharma[1], Yogesh Joshi[2*]

[1]Pharm.D Research Scholar, Department of Pharmacy Practice, Division of Pharmaceutical Sciences, Shri Guru Ram Rai Institute of Technology and Science, Patel Nagar, Dehradun-248001, Uttarakhand, India
[2]Associate Professor, Department of Pharmacy Practice, School of Pharmaceutical Sciences, Shri Guru Ram Rai University, Patel Nagar, Dehradun-248001, Uttarakhand, India

DOI: 10.36348/sjmps.2022.v08i05.007 | **Received:** 25.03.2022 | **Accepted:** 04.05.2022 | **Published:** 20.05.2022

***Corresponding author:** Dr. Yogesh Joshi
Associate Professor, Department of Pharmacy Practice, School of Pharmaceutical Sciences, Shri Guru Ram Rai University, Patel Nagar, Dehradun-248001, Uttarakhand, India

Abstract

Nowadays, skin disorders are considered very common affecting millions of people worldwide. Ageing, genetic, environmental factors and traumatic injuries are various factors that can lead to several skin disorders. Skin disorders are broadly classified as bacterial, viral, fungal and some other types as well. Some common diagnostic tests relevant for skin disorders include biopsy, scraping, culture, wood light, diascopy and specific skin tests. Medical therapy and physical therapy are the treatment modalities available for skin disorders. Medical therapy includes topical and systemic treatments while physical therapy consists of cryotherapy, phototherapy, photodynamic therapy, lasers and surgery. Topical drugs are the mainstay of treating skin disorders. Systemic drugs are taken directly by oral route or by parenteral route and are distributed throughout the body. The following categories of drugs are divided under topical therapy that includes cleansing agents, protective agents, moisturizing agents, drying agents, anti-itch agents, anti-inflammatory agents, anti-infective agents and keratolytics.

Keywords: Skin disorders, bacterial, viral, fungal, treatment.

INTRODUCTION

Skin disorders are the crucial part of the worldwide total of diseases and affecting a lot of people globally. Since the origin of mankind, skin diseases have been known to exist and currently considered globally under the heads of dermatology. Skin is the largest organ of the body with the total area of about 20 square feet. Changes in the skin often indicate the problem of other body system including liver disorders, cancer, shock, anaemia, respiratory disorders. Skin is also considered as the first defence mechanism and protects our body against foreign particles and helps regulate body temperature, fluid balance, synthesis of vitamin D and sensations. Skin is composed of three different layers (**Figure 1**). First layer is epidermis which is considered as the outermost layer of the skin which is relatively delicate and hard. Second middle layer is dermis which is a thick layer of fibrous and elastic tissue. Dermis consist of sweat glands, oil glands and nerve endings. Third layer is subcutaneous layer (fat layer) that protects the body from cold and hot and works as an area that stores energy [1-6].

Rudolph Virchow, a pathologist about 100 years ago, studied skin as defensive coating or more subtle and functionally sophisticated vitals. After this, the skin was seen as a passive barrier to loss of fluids and injury. Somewhere this is known that skin comprises of number of inters dependent cell structures and types that aim towards a protecting goal. Squamous epithelial cells in extension to keratin production are also known for the biosynthesis of slobke molecules i.e. cytokines. Melanocytes are accountable for the generation of brown pigment i.e. melanin. Langerhans cells are epidermal dendritic cells responsible to convey information to the lymphoid cells and also process antigens [7].

Skin disorders have become so common nowadays affecting millions of people worldwide. Ageing, genetic, environmental factors and trauma are the various factors that can lead to several skin disorders. These disorders are broadly classified as bacterial, viral, fungal [8].

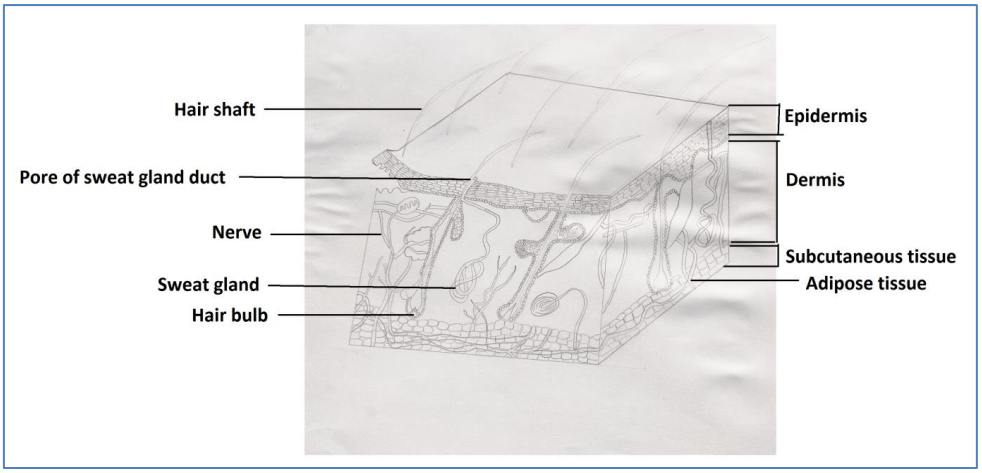

Fig-1: Anatomy of Skin

Bacterial skin disorders

Although skin serves as a protective layer against many bacteria's but some of them gets into the body and are able to cause an infection. These infections can be mild to moderate and severe as well as life threatening. These infections happen when bacteria arrive through hair follicles or small holes that can be due to any surgery, burn, punctures, sunburn, wounds and many others. There are several bacteria that infect the skin but the most common are staphylococcus and streptococcus. Methicillin-resistant staphylococcus aureus is the most common bacteria known to cause skin infection in the United States. Some severe bacterial infections include cellulitis, lymphangitis and necrotizing skin infections while less severe bacterial skin infections include folliculitis, carbuncles, ecthyma, impetigo and skin abscess. People those who are at greater risk of developing bacterial infections are diabetic people, hospitalized people or those working in a nursing home. Antibiotics and drainage of abscess can be taken as a preventive measure to treat bacterial infections [9,10].

Viral skin disorders

There are different types of viruses responsible to cause skin disorders and predominantly includes poxvirus, herpesvirus, coronavirus, hepatitis virus and papillomavirus. Poxvirus belongs to largest type of virus and has a complex DNA virus. Their primary hosts are humans, monkeys, cows, sheeps and cats. Among various groups of poxvirus there are orthopoxviruses which includes smallpox, vaccinia, cowpox and monkeypox; parapoxviruses which includes milker's nodule and orf; miscellaneous includes molluscum contagiosum.

Smallpox (caused by variola vera) is defined as an acute highly contagious viral infection with greater mortality. Symptoms include fever, chills, blister, pustules etc. Milker's nodule is defined as a para vaccinia infection which generally spreads from cows to farmers. Symptoms include nodules which are dome-shaped, firm. Molluscum contagiosum is a communicable skin disease affected by a poxvirus causing white or pink dome shaped as well bumps. These bumps can occur on many parts of the body and are not painful or itchy. Treatment measure could be cryotherapy, curette, candida antigen etc. Herpes virus infection is defined as the diseases that are caused by herpes simplex virus type 1 (HSV-1) or type 2 (HSV-2). Picornavirus infection can be caused by coxsackievirus A and B as well as enterovirus [11,12].

Fungal skin disorders

Fungal infections usually makes their home near the areas of the body that are moist and where skin surfaces met are preferable place for fungi to attack. Genital area, under the breasts, and between the toes are the most common areas. Fungal infections are caused by yeast like candida, malassezia furfur and dermatophytes. People who are obese are most likely to have this infection as they have many skin folds and the skin may get broken down. Diabetic people are also more likely to cause fungal infections. Antifungal drugs and moisture prevention are considered as some of the treatment measure [13].

Some other skin disorders

Acne is an inflammatory skin condition in which hair follicles become clogged. Acne is common among all age groups but most prevalent in teenagers and adults. Various types of lesions and pimples are caused by acne. Various reasons can lead to acne like production of oil in the pores is high, increase in number of dead skin cells and bacterial growth. There are several types of acne like whiteheads, blackheads, papules, pustules, pimples, nodules, cysts and abscesses [14].

Psoriasis is an auto-immune disorder that happens when T lymphocytes attacks the skin cells that are healthy. Mostly the lesions have characteristic scales or red patches that can appear anywhere on the body in large or small patches, particularly the elbows, knees, buttocks, chest and scalp. A very common type

of psoriasis is plaque psoriasis in which there are red, silvery, shiny patches [15].

Eczema or dermatitis is interchangeable, synonymous and most confusing terms in dermatology. Dermatitis is an inflammation of the upper layers of the skin, causing itching, blisters, redness, swelling, oozing, scabbing and scaling. Various types of dermatitis/ eczema include:

- Atopic dermatitis: The dermatitis which appears in infancy is chronic in nature and causes itching and skin inflammation.
- Contact dermatitis: It is divided into irritant contact dermatitis and allergic contact dermatitis. Often both are present in same person and can appear clinically quite similar.
- Other forms of dermatitis: It includes hand dermatitis, asteatotic dermatitis and nummular dermatitis [12, 16].

Blistering disorders are the conditions in which there are fluid-filled skin lesions called blisters.

A blister is a fluid bubble that is formed beneath the dead skin. This fluid is a combination of water and proteins that oozes out of the injured tissue. Blisters are formed as a result of burn or irritation. Many diseases and injuries can cause blistering, but three autoimmune skin diseases are among the most serious named bullous pemphigoid, dermatitis herpetiformis and pemphigus vulgaris [12, 17].

Skin Cancer is the most common type of cancer. People with fair complexion are at high risk of developing skin cancer as they produce less melanin as compare to others. Melanin is a pigment that protects the skin from UV light. Major types of skin cancers are basal cell carcinoma, squamous cell carcinoma and melanoma. Less common types of skin cancer are atypical fibroxanthomas, cancer of skin glands, kaposi sarcoma and merkel cell carcinoma [18].

Diagnostic tests for skin disorders

Diagnostic tests are indicated when the cause of a skin lesion or disease is not obvious from history and physical examination alone. These include:

- Biopsy- A small piece of skin is taken for analysis under the microscope.
- Scraping- If scabies or fungal infection is detected then the doctor might do scraping in which a small piece of skin is scraped and seen under the microscope.
- Culture- In case of any infection being detected, sample can be sent to the laboratory for further investigation and if it contains bacterial, fungal or viral infection then the growth will be seen and can be observed.
- Wood light- In this UV light is thrown on the skin and if any infection like bacterial, viral or fungal are detected then this light can cause these microorganisms to glow brightly.
- Diascopy- In this physician can examine the colour differences that happen when pressure is applied to the skin.
- Skin tests- It includes a use test, a patch test, a prick test and an intradermal test [19].

Treatment of Skin Disorders

Treatment modalities for skin disorders can be broadly categorised into medical therapy and physical therapy. Medical therapy includes topical and systemic treatments while physical therapy consists of cryotherapy, phototherapy, photodynamic therapy, lasers and surgery. Topical drugs are the mainstay of treating skin disorders. Systemic drugs are taken directly by oral route or by parenteral route and are distributed throughout the body. Topical preparations are available in different dosage forms like ointments, creams, lotions, foams, solutions, gels, baths and soaks, powders and many others. Topical drugs can be divided into various categories [1, 20].

- **Cleansing agents**

Soaps and detergents are the most popular cleansing agent. Soaps are cleansing and emulsifying agents containing fat, while detergents are made from petroleum products. Some soaps tend to dry out the skin, but some have creamy base that are less drying. As baby shampoos are good cleansing agents and gentle to the skin, so they are good for cleansing wounds, cuts, abrasions and areas around the eyes. Lesions which ooze out should be cleansed only with water or gentle soaps because harsh soaps and detergents can irritate the area. Small quantity of alcohol can safely be used to cleanse the skin before injections or withdrawing blood. Alcohol based gels are useful as hand sanitizers for routine hand hygiene.

- **Protective agents**

Many different kinds of preparations that help protect the skin are called protective agents. Oils and ointments supply an oil-based barrier that can help protect skin and retain moisture. Skin that rubs against skin or clothing are well protected by powders. Synthetic hydrocolloid dressings protect pressure sores like bedsores, decubitus ulcers and other areas of raw skin. Sunscreens and sunblock preparations reflect, absorb or filter out harmful ultraviolet light to protect the skin.

- **Moisturizing agents**

Moisturizing agents restore and help maintain water and oils in the skin. The best time to apply a moisturizer is when the skin is already moistened means immediately after a bath or shower. Moisturizers typically contain glycerine, mineral oil, or petrolatum and are available as lotions, creams, ointments, and bath oils. Some stronger moisturizers contain compounds such as urea, lactic acid and glycolic acid. Cold creams

are over-the-counter moisturizing emulsions of fats and water.

- **Drying agents**

Extra moisture in areas where skin rubs against skin can cause irritation and skin breakdown, particularly in areas of those body folds where the environment tends to be warmer and moist. The most commonly affected areas are between the toes or buttocks, in the armpits or groin, and under the breasts and abdominal skin folds. These warm moist areas also provide fertile breeding grounds for infections, especially with fungus and bacteria. Talcum and corn starch powders absorb moisture from the skin surface. Solutions containing aluminium salts are drying agents commonly found in antiperspirants. Astringents like aluminium acetate solution are liquid drying agents that shrink and contract the skin by precipitation of proteins. They are useful to treat infectious such as eczema, oozing skin lesions and pressure sores.

- **Anti-itch agents**

Skin disease is often accompanied by itching and mild pain, which sometimes can be controlled with over-the-counter agents such as camphor, menthol, zinc oxide or a lidocaine and prilocaine mixture. Calamine is a common soothing agent that helps relieve itching and can also help dry out the skin. Antihistamines are used in topical preparations to help relieve the itching associated with allergic reactions. Doxepin is an effective topical antihistamine for many conditions. The antihistamine, diphenhydramine, can trigger an allergic reaction when applied to the skin while taking it by oral route does not seem to produce any skin reaction, so oral rather than topical antihistamines are preferred to relieve itching. Benzocaine, an anesthetic has been used to relieve itching, can also trigger allergic reactions and so is not recommended.

- **Anti-inflammatory agents**

Corticosteroids are the main topical agents used to relieve inflammation of the skin. They are found to be most effective for rashes caused by allergic or inflammatory reactions to things such as metals, cloths, drugs, eczema and many others. As they lower resistance to bacterial and fungal infections and inhibit wound healing process, corticosteroids should not be used on infected areas or wounds. For acne-like disorders, topical corticosteroids do not work well and instead induce an acne-like eruption. Corticosteroids are sometimes mixed with antifungal drugs to help reduce redness and itching alongside eradicating the fungus. Corticosteroids should be used with caution on areas where the skin is thin, such as the face, armpits, groins and genitals. Prolonged use in any area can cause skin breakdown, stretch marks, acne-like eruptions and an allergic skin reaction to the corticosteroid itself. Perioral dermatitis and periorbital dermatitis occurs as a side effect more commonly with mid or high-potency formulations used on the face and less commonly with mild formulations.

- **Anti-infective agents**

Viruses, bacteria, fungus and parasites can all causes infections in skin. Disinfectants are commonly used by healthcare professionals to prevent spreading infections among patients. Once a skin infection has occurred, it required to be treated with topical or systemic drugs depending on the nature of its severity and type of infection diagnosed or suspected. Topical anti-infective agents include antibiotics, antifungals, antivirals and insecticides. Topical antibiotics like metronidazole, sulfacetamide, clindamycin and erythromycin are used for rosacea while clindamycin and erythromycin are additionally used in the treatment for acne. Mupirocin, retapamulin and ozenoxacin can be used to treat impetigo. Non-prescription antibiotics such as bacitracin and polymyxin have been replaced by topical petrolatum in postoperative care of a skin biopsy site and used to prevent infection in scrapes, minor burns and abrasions. Topical antifungal drugs treated wide variety of fungal infections of the skin but poorly treat fungal infections of the nails. Nail fungal infections are best treated with oral drugs, but chances of relapse are very common even when oral drugs are taken. Insecticides like permethrin and Malathion are useful in the treatment of lice infestations and scabies. Non-antibiotic topical antiseptics stop or slow the growth of microbes on the skin and are therefore considered to be anti-infective (antimicrobial). Silver sulfadiazine is effective in treating burns and ulcers as it has strong antimicrobial properties. Sodium hypochlorite is used in some disinfectant sprays and body washes. Zinc pyrithione is one of the common ingredients in shampoos that treat dandruff caused by psoriasis or seborrheic dermatitis.

- **Keratolytics**

These are agents that soften and loosen skin cells and ease the exfoliation process of the upper layer of skin. Examples of keratolytics include salicylic acid and urea. Salicylic acid in variable concentration is used to treat psoriasis, seborrheic dermatitis, acne and warts. Side effects associated with salicylic acid commonly include burning, irritation and systemic reactions caused by absorbing it. Salicylic acid is rarely used in children and infants, who are found to be most susceptible to systemic reactions. Urea can be used to moisturize, soothing and reduction of scaling. It is commonly used to treat excessive skin build-up on the soles of the feet (called plantar keratodermas and calluses), dry bumps on thighs and back of arms in people with allergies (keratosis pilaris), and other dry skin conditions such as ichthyosis. Side effects associated with urea are irritation and burning, therefore should not be applied to large areas of skin [20].

CONCLUSION

The present review on skin disorders and their treatment is the need for understanding among all healthcare professionals of present world as skin diseases have greater impact on every household or even in whole society. Better understanding of skin disorders among patients as public representatives is also desirable in current world.

REFERENCES

1. Chiang, N. Y. Z., & Verbov, J. (2014). Dermatology- A handbook for medical students and junior doctors, 2nd Edition, British Association of Dermatologists.
2. Dipirio, J. T., Talbert, R. L., Yee, G. C., Matzke, G. R., Wells, B.G., & Posey, L. M. (2008). Pharmacotherapy: A Pathophysiologic Approach, 7th Edition, The McGraw-Hill Companies, Inc.
3. Alani, A., Sadlier, M., Uddin, A., Hackett, C., Ramsay, B., & Ahmad, K. (2017). An analysis of inpatient dermatologic consultations at University Hospital Limerick: inadequate infrastructure leads to acute skin failure. Ir J Med Sci, 186, 305-307.
4. Hay, R. J., Johns, N. E., Williams, H. C., Bolliger, I. W., Dellavalle, R. P., Margolis, D. J., Marks, R., Naldi, L., Weinstock, M. A., Wulf, S. K., Michaud, C., Murray, C. J. L., & Naghavi, M. (2014). The global burden of skin disease in 2010: an analysis of the prevalence and impact of skin conditions. J Invest Dermatol, 134(6), 1527-1534.
5. Alcalay, J. (2008). Dermatology: a medical, surgical and aesthetic profession. Isr Med Assoc J, 10, 404-405.
6. McCaw, I. H. (1944). A synopsis of the history of dermatology. Ulster Med J, 13(2), 109-122.
7. Benedetti, J. Structure and Function of the Skin. MSD Manual: Consumer Version. Available at https://www.msdmanuals.com/en-in/home/skin-disorders
8. Karimkhani, C., Dellavalle, R. P., Coffeng, L. E., Flohr, C., Hay, R. J., Langan, S. M., Nsoesie, E. O., Ferrari, A. J., Erskine, H. E., Silverberg, J. I., Vos, T., & Naghavi, M. (2017). Global Skin Disease Morbidity and Mortality-An Update from the Global Burden of Disease Study 2013. JAMA Dermatol, *153*(5), 406-412.
9. Stulberg, D. L., Penrod, M. A., & Blatny, R. A. (2002). Common bacterial skin infections. American Family Physician, *66*(1), 119-124.
10. Rehmus, W. E. Bacterial Skin Infections. MSD Manual: Professional Version. Available at https://www.msdmanuals.com/en-in/professional/dermatologic-disorders/bacterial-skin-infections
11. Dinulos, J. G. H. Viral Skin Diseases. MSD Manual: Professional Version. Available at https://www.msdmanuals.com/en-in/professional/dermatologic-disorders/viral-skin-diseases
12. Sterry, W., Paus, R., & Burgdorf, W. (2006). Thieme Clinical Companions Dermatology. 1st ed. Stuttgart: Thieme Publications, Viral diseases, p. 53.
13. Aaron, D. M. Overview of Fungal Skin Infections. MSD Manual: Consumer Version. Available at https://www.msdmanuals.com/en-in/home/skin-disorders/fungal-skin-infections/overview-of-fungal-skin-infections
14. Keri, J. E. Acne. MSD Manual: Professional Version. Available at https://www.msdmanuals.com/en-in/home/skin-disorders/acne-and-related-disorders/acne
15. Das, S. Psoriasis. MSD Manual: Professional Version. Available at https://www.msdmanuals.com/en-in/home/skin-disorders/psoriasis-and-scaling-disorders/ psoriasis
16. Ruenger, T. M. Overview of Dermatitis. MSD Manual: Consumer Version. Available at https://www.msdmanuals.com/en-in/home/skin-disorders/itching-and-dermatitis/overview-of-dermatitis
17. Peraza, D. M. Overview of Blistering Disorders. MSD Manual: Consumer Version. Available at https://www.msdmanuals.com/en-in/home/skin-disorders/blistering-diseases/overview-of-blistering-disorders
18. Wells, G. L. Overview of Skin Cancer. MSD Manual: Consumer Version. Available at https://www.msdmanuals.com/en-in/home/skin-disorders/skin-cancers/overview-of-skin-cancer
19. Benedetti, J. Diagnosis of Skin Disorders. MSD Manual: Consumer Version. Available at https://www.msdmanuals.com/en-in/home/skin-disorders/biology-of-the-skin/diagnosis-of-skin-disorders
20. Keri, J. E. Treatment of Skin Disorders. MSD Manual: Consumer Version. Available at https://www.msdmanuals.com/en-in/home/skin-disorders/treatment-of-skin-disorders/ treatment-of-skin-disorders