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Skin Diseases: Topical Treatment

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ABSTRACT

Skin diseases are conditions that impact the skin, leading to symptoms such as rashes, inflammation, itching, or other alterations in skin appearance. Some of these conditions can be hereditary, while others might be triggered by lifestyle factors The incidence of skin diseases has risen over the past few decades, imposing a substantial burden on healthcare systems worldwide. Treatments for skin diseases can involve medications, topical creams or ointments, and changes in lifestyle. Although skin diseases do not significantly contribute to years of life lost and have a lower impact on disability-adjusted life years, they have a much greater effect on disability and years lived with disability.The Global Burden of Disease Study 2017 includes twelve dermatoses in the category of skin and subcutaneous diseases: psoriasis, dermatitis (atopic, contact, and seborrheic), scabies, bacterial skin infections (cellulitis and pyoderma), fungal skin diseases, pruritus, viral skin diseases, acne vulgaris, alopecia areata, urticaria, decubitus ulcers, and other skin and subcutaneous diseases.. In this review article, we discussed various skin conditions along with some of its synthetic treatment with a brief of skin structure and its function.

Introduction

Skin disease affects 30 to 70 percent of people worldwide and is common in all age groups and geographical areas. It is the fourth largest cause of nonfatal disease burden.1. In primary care, 8–36% of patients arrive with at least one skin complaint, making skin illness one of the most prevalent major complaints2, 3. However, there is a persistent shortage of dermatologists, especially in rural regions, and the cost of consultations is rising4,5. Therefore, non-specialists like primary care physicians (PCPs), nurse practitioners (NPs), and physician assistants (PAs) are frequently tasked with triaging and diagnosing patients. due to inadequate training and expertise in a field with hundreds of circumstances9. Only 24-70% of non-specialists' diagnoses are accurate.10–13, despite the accessibility and utilization of resources such internet, UpToDate14, and dermatology textbooks.

Inaccurate diagnosis results might cause patients to receive subpar care, such as delayed or incorrect treatment[1].

In order to increase access to experts and boost the precision of diagnoses, The number of store-and-forward teledermatology programs increased by 48% in U.S. non-governmental programs between 2011 and 201616, indicating the growing popularity of this approach. Store-and-forward teledermatology involves sending a dermatologist digital pictures of the damaged skin areas, which are usually taken using cellphones or digital cameras, together with other medical data. After reviewing the case remotely, the dermatologist offers advice on the diagnosis, work-up, course of therapy, and suggested follow-up measures. Research has demonstrated that this method produces comparable clinical results to traditional consultation in dermatological clinics17 and enhances patient and provider satisfaction..Using artificial intelligence techniques could be a viable way to increase the number of dermatology experts available [2]. Recent developments in deep learning have made it easier to create artificial intelligence instruments that help with skin diagnosis illnesses resulting from visuals. The visual identification of skin lesions from dermoscopic images, which call for a dermatoscope, has been the subject of numerous earlier studies19–26. Dermatoscopes, however, are typically only available at dermatology clinics and are not required for many common skin conditions. Others, on the other hand, have focused on clinical photos. Esteva et al., for instance, used deep learning to separate malignant from benign variations in photos of skin cancers27. A region-based classifier was created by Han et al. to recognize onychomycosis in clinical pictures.28Utilizing techniques for artificial intelligence could be another.Even though skin conditions are widespread among people in many underdeveloped nations, public health initiatives have not been seen to be necessary to address this issue. In fact, in the same countries, certain less prevalent health issues frequently receive greater attention. This mindset results from the presumption that skin conditions are a minor annoyance that is not life-threatening and do not need interventions that seem excessive given their low importance. Nonetheless, there appears to be a strong desire, at least in certain nations, for skin illnesses to receive more attention from both patients and medical professionals [3].

This publication provides comprehensive data on the epidemiology of common skin illnesses and their significance as potential control methods, based on a thorough examination of the medical literature over the previous three decades. The purpose of the project was to eventually incorporate topics about skin disorders in kids enrolled in Integrated Management of Childhood Illness (IMCI) programs. The goal of the publication is to give health officials all the information they need to debate the issue rationally [4].

Structure and function of skin

The skin is the largest organ of the human body, serving several crucial functions essential for health and well-being. It is composed of three main layers: the epidermis, dermis, and hypodermis (subcutaneous layer). Here are the primary functions of the skin:

Protection:

Barrier against pathogens: The skin acts as a physical barrier that prevents harmful microorganisms from entering the body.

Chemical protection: It shields the body from harmful substances and environmental pollutants.

Physical protection: It guards underlying tissues and organs against physical injuries, UV radiation, and dehydration [5].

Sensation:

The skin contains numerous nerve endings and receptors that detect touch, pressure, temperature, and pain, allowing the body to react to external stimuli.

Temperature Regulation:

Sweating: Sweat glands in the skin help cool the body through the evaporation of sweat.

Blood flow: The skin can regulate blood flow. When the body is hot, blood vessels in the skin dilate to release heat, and when it's cold, they constrict to retain heat.

Excretion:

The skin helps eliminate waste products such as urea, salts, and water through sweating.

Synthesis of Vitamin D:

When exposed to sunlight, the skin synthesizes Vitamin D, which is essential for maintaining healthy bones and immune function.

Storage:

The skin stores lipids and water, providing insulation and energy reserves.

Immunological Functions:

The skin has immune cells that act as the first line of defense against infections and other disease [6].

Aesthetics and Communication:

The skin's appearance, including its color and texture, plays a role in social interactions and can indicate overall health. Facial expressions and other skin changes also help in non-verbal communication.

Skin type

Skin types can vary significantly among individuals, and understanding your skin type is essential for effective skincare. The primary skin types are generally categorized as follows:

Normal Skin:

Characteristics: Balanced moisture and oil levels, smooth texture, fine pores, and few imperfections.

Description: Neither too oily nor too dry, normal skin has a radiant complexion and is not prone to severe sensitivity.

Dry Skin:

Characteristics: Flaky or rough texture, tight feeling, dull complexion, and more visible lines.

Description: Lacks natural moisture and oil, often leading to irritation and sensitivity. May feel itchy or rough, especially after washing.

Oily Skin:

Characteristics: Shiny appearance, enlarged pores, frequent acne and blackheads.

Description: Produces excess sebum, which can lead to clogged pores and breakouts. However, oily skin often ages more slowly because it remains naturally lubricated [7].

Combination Skin:

Characteristics: A mix of oily and dry areas, typically with an oily T-zone (forehead, nose, and chin) and dry or normal cheeks.

Description: Requires specialized care to address the varying needs of different areas. Balancing products are often used to manage this skin type.

Sensitive Skin:

Characteristics: Redness, itching, burning, and dryness, prone to reactions to skincare products or environmental factors.

Description: Easily irritated by factors like chemicals, fragrances, or weather changes. Often needs gentle, soothing products to avoid flare-ups [8].

Aging or Mature Skin:

Characteristics: Loss of elasticity, fine lines and wrinkles, thinner texture, and dryness.

Description: Shows signs of aging such as decreased firmness and more pronounced wrinkles. Needs moisturizing and anti-aging products to maintain health and appearance.

Additional Factors Affecting Skin Type

Climate: Humidity and temperature can influence skin behavior. For instance, skin may become oilier in humid climates and drier in cold, dry climates.

Hormones: Hormonal changes (e.g., puberty, pregnancy, menopause) can alter skin type, often increasing oiliness or causing breakouts.

Diet and Lifestyle: Diet, hydration, sleep, and stress levels also impact skin health and type [9].

Layer of skin

The skin is composed of three primary layers, each with distinct structures and functions:

Epidermis:

Stratum Corneum: The outermost layer, consisting of dead, flattened keratinocytes. It acts as a barrier to protect underlying tissues from infection, dehydration, and environmental damage.

Stratum Lucidum: A thin, clear layer found only in thick skin, such as the palms of the hands and soles of the feet.

Stratum Granulosum: Contains keratinocytes that are starting to die and form a barrier against water loss.

Stratum Spinosum: Provides strength and flexibility to the skin, containing keratinocytes connected by desmosomes [10].

Stratum Basale: The deepest layer, containing basal cells that continuously divide and push older cells toward the surface. This layer also contains melanocytes, which produce melanin, giving skin its color.

Dermis:

Papillary Layer: The upper layer of the dermis, consisting of loose connective tissue. It contains capillaries, lymph vessels, and sensory neurons. The papillae form ridges that create fingerprints.

Reticular Layer: The deeper and thicker layer of the dermis, composed of dense, irregular connective tissue. It provides structural strength and elasticity, housing blood vessels, hair follicles, nerves, sweat, and sebaceous glands [11].

Hypodermis (Subcutaneous Layer):

This layer is composed mainly of adipose tissue and connective tissue. It provides insulation, energy storage, and cushioning for the skin. It also contains larger blood vessels and nerves than those found in the dermis.

Functions of Each Layer

Epidermis:

Protection: Acts as a barrier against pathogens, UV radiation, and harmful chemicals.

Waterproofing: Prevents water loss and entry of water from the environment.

Regeneration: Constantly renews itself through the division of basal cells.

Dermis:

Support and Structure: Provides elasticity and strength through collagen and elastin fibers.

Nourishment: Supplies the epidermis with nutrients through blood vessels.

Sensory Perception: Contains nerve endings that respond to touch, pain, temperature, and pressure.

Thermoregulation: Sweat glands and blood vessels help regulate body temperature.

Hypodermis:

Insulation: Helps to retain body heat and protect against cold.

Shock Absorption: Cushions and protects underlying organs and tissues from mechanical damage.

Energy Storage: Stores fat that can be used as an energy reserve [12].

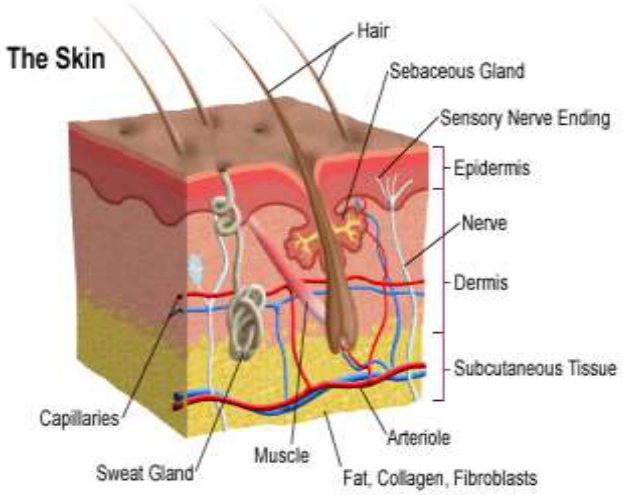

Figure 1: Structure of skin

Type of Skin diseases

1. Acne
2. Atopic dermatitis (Eczema)
3. Psoriasis
4. Melanoma
5. Measles
6. Urticaria
7. Scabies

1. Acne

Fifty to eighty percent of teenagers and young adults suffer with acne. This condition affects the pilosebaceous unit, which is made up of the oil gland and hair follicle. Among the elements that lead to the development of acne are elevated levels of sebum, which is a mixture of oil and wax that serves to shield the skin), more material accumulation in the hair follicle, elevated levels of the bacteria Cutibacterium acnes (which is often found on the skin in small amounts), and inflammation. In terms of clinical classification, acne can be divided into three types: nodular (big, painful cysts), inflammatory (red bumps), and comedonal (whiteheads and blackheads) [13].

Hormones instruct the skin's oil glands to secrete more sebum. Whiteheads and blackheads are caused by a plug made of sebum and keratin, a protein that aids in maintaining the structure of the skin, hair, and nails. The P. acnes concentrations are supported by increased sebum production. This results in further irritation and obstruction of the hair follicle entrance. In the end, the hair follicle may burst, leaving behind painful, sizable nodules. An further factor in the development of acne is insulin. In addition to indirectly raising the levels of other hormones that stimulate the oil gland, such as androgens and insulin-like growth factor, insulin and insulin-like growth factor also directly increase the activity of the oil gland.

Treatment

Skin care-The first step to managing acne is to adhere to gentle skin care practices. The skin should be rinsed gently with warm water once or twice a day. Washcloths or other abrasive materials should be avoided, and only gentle, nonsoap-based cleansers should be used. Detergent-based soaps, toners, and astringents further dry and irritate the skin. While they do remove oil and sebum from the surface of the skin, they do not alter sebum production within the oil gland. Ultimately, overly dry skin signals the pilosebaceous units to make more oil in order to adequately protect the skin. Moisturizers can help acne, but it is important to make sure any moisturizers or cosmetics are not oil based and are labeled noncomedogenic. The impulse to pick and squeeze acne lesions is common and can be difficult to overcome. These practices can lead to immediate gratification, but ultimately slow down the disappearance of specific acne lesions. These practices also result in tissue injury, which creates more inflammation and potential scarring that is very difficult, if not impossible, to reverse [14].

OMEGA-3 FATTY ACIDS Omega-3 fatty acids have been shown to decrease the production of inflammatory compounds and of the hormones important in acne formation. Additionally, groups of people who consume high amounts of omega-3 fatty acids have less acne than groups of people who have lower levels of this nutrient. Ideally, omega-3 fatty acids should come from foods such as fatty fish (salmon, mackerel, and sardines), flaxseeds, and walnuts. When that is not possible, supplements can be helpful.

BREWER'S YEAST Brewer's yeast (Saccharomyces cerevisiae) is commonly used to treat acne in Eastern Europe. It has a high concentration of chromium picolinate, which has been shown to improve glucose tolerance and insulin sensitivity (thereby reducing insulin and insulin-like proteins in the blood stream). One study looked at brewer's yeast supplementation in people with acne and found significant improvement in 80% of those taking the supplement. It is generally quite safe, but due to high levels of tyramine, it can cause headaches in people sensitive to this compound and can cause higher blood pressures in people who are also taking monoamine oxidase inhibitors. Brewer's yeast may also worsen Crohn's disease.Oral antifungal medications may decrease the effectiveness of the yeast.

Vitamin E. This vitamin is a strong antioxidant. Although it has been found in lower concentrations in patients with acne, the specific role vitamin E plays in the development of acne is not clear. It is generally considered safe up to doses of 1,500 IU a day. At higher doses, there is a risk of problems with blood clotting, which can lead to increased bleeding [15].

2. Atopic dermatitis

Atopic dermatitis is a recurrent, chronic dermatitis that usually manifests in the early stages of children or infancy. It impacts five to twenty percent of children worldwide. Atopic dermatitis is more widespread in industrialized countries and seems to be getting worse every day both in rural and urban areas. There are three age groups for eczema: infant, childhood, and adult. Usually the face and extensors are affected in babies. Both adult and childhood eczema are characterized by more persistent inflammation and thicker, dry, scaly skin, with a tendency to affect the flexural areas. Skin irritants usually cause less tolerance in those who have eczema. Sweat and heat are the most frequent offenders, followed closely by wool and psychological tension.

The course of eczema is influenced by numerous factors. A significant predictive risk factor is family history, particularly maternal history, but several environmental factors also seem to exist, such as inadequate exposure to microbes in early both early life and prolonged exposure to air pollution. People who have eczema are more susceptible to increased evaporation of moisture from the skin and lower skin moisture retention due to difficulties with their skin barrier. They also have a higher chance of getting skin infections brought on by fungi, viruses, and bacteria. Additionally hyperreactive is the superficial cutaneous nerve system in individuals with atopic dermatitis, and they are more prone to itching [16].

Along with the physical symptoms of this condition, atopic dermatitis carries a significant emotional burden. People with atopic dermatitis have been found to have a significantly decreased quality of life and self-esteem, as well as increased sleep disturbances, depression, and anxiety.The fact that stress worsens symptoms of atopic dermatitis can result in a downward spiral with stress from the atopic dermatitis worsening the flare, which can worsen stress.

Treatment

GAMMA LINOLENIC ACID essential fatty acid deficiency can cause eczema-like skin changes including dry, scaly, itchy skin with impaired barrier function. Replenishing these essential nutrients reverses the skin problems seen in deficiency states. This has led people to consider potential abnormalities in essential fatty acid metabolism in people with atopic dermatitis. At least some patients with eczema may have decreased levels or defects in delta-6-desaturase—an enzyme involved in converting linoleic acid (found in seed and corn oils) to gammalinolenic acid (GLA). GLA is an omega-6-polyunsaturated fatty acid that is converted to dihomo-GLA which is important in the formation of anti-inflammatory prostaglandins in the skin.Given these findings, it would make sense that supplementation with GLA (found in borage oil, evening primrose oil, hemp oil, and black current oil) should help with the management of eczema. However, studies looking at use—particularly of borage oil and evening primrose oil—have been conflicting. A recent Cochrane review looking specifically at studies evaluating borage and evening primrose use in eczema found no benefit. Many of the studies included were small and flawed. Overall, these products are generally safe.[17].

Glycyrrhetinic acid

One ingredient found in licorice root, glycyrrhetinic acid, inhibits the action of enzyme 11-beta-hydroxysteroid dehydrogenase, which is in charge of deactivating cortisol. It has been demonstrated to enhance hydrocortisone's effects on the skin. It has also been demonstrated that glycyrrhetinic acid possesses anti-inflammatory qualities, the capacity to reduce IgE-related skin disorders in mice, and the capacity to prevent mast cell histamine generation in vitro.

A topical over-the-counter cream called Atopiclair has 2% glycyrrhetinic acid along with vitis vinefra, an extract from grapevines high in antioxidants and enzymes that stop the breakdown of skin proteins, and telmestine, an enzyme complex that inhibits the breakdown of molecules critical to the skin's structure.

3. Psoriasis

Psoriasis is a non-infectious chronic inflammatory skin disorder clinically characterizes by erythematous sharply demarcated papules and rounded plaques covered by silvery micaceous scales. Psoriasis is notoriously chronic and is well known for its course of remissions and relapses. The word 'psoriasis', is derived from the Greek word "psora" meaning "itch" or "scurf" or "rash", although most patients suffering from the condition do not complain of itching. It has been known since ancient times and was originally considered a type of leprosy . Psoriasis is one of the oldest recorded skin diseases. The

famous Hippocrates and his school (460–377 B.C.) produced objective and meticulous descriptions of many skin disorders. In their classification, dry scaly eruptions were grouped together under 'lopoi' (epidermis). This group probably included psoriasis and leprosy. The confusion between Psoriasis and leprosy remained for many centuries. From 1000 – 1400 A.D. the prevalence of leprosy was very high. Many psoriatic patients, diagnosed as leprosy, received the same brutal treatment as leprosy patients and were isolated from the community. Psoriasis was again mentioned in the first century by Cornelius celsus, a Roman author. Celsus described it as the fourth variant of impetigo, a condition caused by Staphylococcus pyogenes. This condition appears as red patches with watery blisters on the skin [18]. The English dermatologist, Robert Willan (1757 ~ 1812) recognized psoriasis as an independent disease. He identified two categories. "Leprosa Graecorum" was the term he used to describe the condition when the skin had scales. Psora Leprosa described the condition when it became eruptive. Galen was the first who used the word 'Psoriasis'. Under this name he described a skin disorder characterized by a scaliness of the eyelids, corners of the eyes and the scrotum along with the itching and excoriations.

The physical and mental functioning of patients with psoriasis is reported to be affected as much as that of patients with cancer, arthritis, hypertension, heart disease, diabetes and depression. Physical and mental functioning scores for psoriasis patients are among the lowest of all groups (10/11 for physical and 9/11 for mental functioning, 11 representing the lowest functioning) [6]. Psoriasis can be extremely debilitating, both physically and emotionally. Lack of proper knowledge and frequent misunderstanding in the general and medical communities about the disorder add to the stigma and emotional stress associated with it. It may also interfere with various aspects of the quality of life such as personal relationships, sports, sexuality, self-care activity and activities at work or school [7]. Psoriasis is a chronic skin disease with severe psychosocial effects. Its chronicity, frequent relapses, the absence of permanent cure and symptoms such as pruritus make it hard to live with. Furthermore, the cosmetic disfigurement has a negative impact on the quality of life due to psychological stress, disruption of social relationships and difficulties in daily life [19].

Treatment

Methotrexate works by inhibiting lymphocytes via multiple mechanisms including dihydrofolate reductase inhibition, aminoimidazole carboxamide ribotide transformylase (AICARTase) blockade and adenosine accumulation. Its most serious adverse effect is bone marrow suppression. Other potential complications of treatment include nausea, pneumonitis, hepatitis, liver fibrosis and teratogenicity. Methotrexate is usually taken orally every week. Subcutaneous formulation causes less gastrointestinal side effects and is more efficacious due to higher bioavailability.22 Ciclosporin is a calcineurin inhibitor and has a rapid onset of action, but may cause hypertension and irreversible renal toxicity. Acitretin is an oral retinoid that promotes keratinocyte differentiation. Its possible side effects include dry skin, hair loss, hyperlipidaemia and hepatotoxicity. Methotrexate and acitretin are contraindicated in pregnancy.23 For disease refractory to methotrexate and/or ciclosporin or where second-line therapies are not suitable, biologic therapies or oral small molecule inhibitors may be considered.

4. Melanoma

Melanoma, which means "black tumor," is the most dangerous type of skin cancer. It grows quickly and has the ability to spread to any organ.

Melanoma comes from skin cells called melanocytes. These cells produce melanin, the dark pigment that gives skin its color. Most melanomas are black or brown in color, but some are pink, red, purple or skin-colored.

About 30% of melanomas begin in existing moles, but the rest start in normal skin. This makes it especially important to pay attention to changes in your skin because the majority of melanomas don't start as moles. However, how many moles you have may help predict your skin's risk for developing melanoma. It's important to know if you're in a high-risk group for developing melanoma skin cancer. Because of the fast growth rate of melanomas, a treatment delay sometimes may mean the difference between life and death. Knowing your risk can help you be extra vigilant in watching changes in your skin and seeking skin examinations since melanomas have a 99% cure rate if caught in the earliest stages. Early detection is important because treatment success is directly related to the depth of the cancerous growth [20].

5. Measles

Measles is a highly contagious viral disease that can cause serious complications. It remains a common cause of death in children under 5 in some parts of the world. In the past, measles infection was very common in childhood in Australia. Most people born before 1966 will have been infected with measles as a child and are likely to be immune. Thanks to immunisation measles is now rare in Australia. However, measles remains common in many parts of the world, and large outbreaks continue to occur in a number of countries. People travelling overseas or coming to Australia can bring the disease back with them, causing measles outbreaks in the community. This is why it is important to make sure you are vaccinated against measles to help protect yourself and the community. It is important to make sure anyone born after 1966 has received two doses of measles vaccine.[21].

Symptoms of measles-

The first symptoms are fever, tiredness, cough, runny nose, sore red eyes and feeling unwell. A few days later a rash appears. The rash starts on the face, spreads down to the body and lasts for 4-7 days. The rash is not itchy. Young children (especially infants) may also experience diarrhoea. The symptoms of measles usually start 10 days after being exposed to the virus but can sometimes take as few as seven or as many as 18 days to appear. The rash usually appears around 14 days after exposure to the measles virus. Measles is a severe disease. Up to a third of people with measles have complications and may require hospitalisation. Complications of measles can include ear infections, diarrhoea, and pneumonia. About one in every 1000 people with measles develops encephalitis (swelling of the brain).

Treatment

Fever reducers. If a fever is making you or your child uncomfortable, you can use over-the-counter medications such as acetaminophen (Tylenol, others), ibuprofen (Advil, Motrin IB, Children's Motrin, others) or naproxen sodium (Aleve) to help bring down the fever that accompanies measles. Read the labels carefully or ask your health care provider or pharmacist about the appropriate dose.

Use caution when giving aspirin to children or teenagers. Though aspirin is approved for use in children older than age 3, children and teenagers recovering from chickenpox or flu-like symptoms should never take aspirin. This is because aspirin has been linked to Reye's syndrome, a rare but potentially life-threatening condition, in such children.

Antibiotics. If a bacterial infection, such as pneumonia or an ear infection, develops while you or your child has measles, your health care provider may prescribe an antibiotic.

Vitamin A. Children with low levels of vitamin A are more likely to have a more severe case of measles. Giving a child vitamin A may lessen the severity of measles infection. It's generally given as a large dose of 200,000 international units (IU) for children older than a year. Smaller doses may be given to younger children.

6. Urticaria

Urticaria, a diverse group of conditions, is marked by the presence of wheals and flares, and sometimes accompanied by angioedema (swelling in the deep dermis and subcutaneous tissue). The causes of urticaria are varied and can include physical stimuli, immune reactions to foods, medications, and infectious agents, or be associated with inflammatory or malignancy conditions. However, idiopathic urticaria, where no specific cause is identified, is the most common.

Signs and Symptoms

The primary symptom of urticaria is pruritus (itching). Other typical signs include wheals and flares that can vary in size. Individual wheals generally resolve within 24 hours without leaving any residual hyperpigmentation. In some instances, urticaria may be accompanied by angioedema, which affects the deep dermis and subcutaneous fat, often occurring in areas such as the periorbital tissues, lips, tongue, and hands. Angioedema can last up to 72 hours and is frequently associated with a burning sensation and/or mild pain, but itching is uncommon.

Urticaria, with or without angioedema, can be a symptom of anaphylaxis. Anaphylaxis may also present with chest discomfort, hoarseness, wheezing, abdominal pain, and diarrhea. Severe respiratory difficulties and circulatory collapse during anaphylaxis can result in anaphylactic shock, which is a serious and potentially life-threatening condition [22].

Treatment

Omalizumab Dosage

The recommended starting dose of omalizumab is 150 mg administered via subcutaneous injection every four weeks. The effectiveness of the treatment is assessed four weeks after the initial injection using the weekly Urticaria Activity Score (UAS7), which patients record over a seven-day period before each visit.

Initial Evaluation: If the UAS7 score decreases by more than 30% from the baseline, the dosage should remain at 150 mg every four weeks.

Dose Adjustment: If there is no significant improvement (UAS7 decrease less than 30% from baseline) after the first four weeks, the dose should be increased to 300 mg every four weeks.

Further Evaluation: If there is still no significant improvement after an additional four weeks on the higher dose, discontinuation of omalizumab should be considered.

For patients who respond well to omalizumab and can reduce other conventional medications, consideration should be given to lowering the omalizumab dose or extending the interval between doses. Discontinuation of omalizumab should be evaluated every 3-6 months. Re-administration of omalizumab after discontinuation is determined by changes in clinical factors and the physician's discretion [23].

7. Scabies

Scabies is a highly contagious skin infestation that can quickly spread through households before it is identified. The characteristic itchy rash, resulting from a delayed hypersensitivity reaction, may take weeks to appear after the initial infestation. It is important to consider scabies if multiple household members experience itching. Prompt treatment is crucial to prevent further transmission and reduce the risk of complications such as cellulitis and acute rheumatic fever.

Scabies is caused by the microscopic female scabies mite (Sarcoptes scabiei var. hominis) burrowing beneath the skin. While scabies can affect individuals of all ages, children, older adults, and immunocompromised individuals are particularly susceptible, especially those in low socioeconomic areas. Person-to-person contact is typically necessary for transmission.

The characteristic itchy skin rash associated with scabies often appears weeks after the initial infestation due to a delayed type IV hypersensitivity reaction to the mites' eggs, feces, and saliva. By the time symptoms develop, transmission of scabies has usually already occurred. Therefore, prompt treatment is essential to prevent further spread. After treatment, some individuals may continue to experience persistent itching, a secondary rash such as dermatitis,

or secondary bacterial infections from excessive scratching. Managing these ongoing symptoms and secondary complications is important for full recovery [24].

Treatment-There are several effective treatments available for scabies, with evidence indicating that standard options are comparably efficacious when used as directed. These treatments include topical permethrin, topical crotamiton, and systemic ivermectin, all of which rarely cause adverse reactions.

Topical permethrin 5% cream is widely used and effective. It is typically applied once a week for two weeks (a total of two treatments). However, challenges such as scabies resistance, poor patient compliance, and occasional allergic reactions can occur.

Oral ivermectin is another treatment option, though it is not FDA-approved for scabies in the United States. It is administered to individuals aged ten years and older, with one dose initially and a second dose two weeks later if symptoms persist. Two doses are scabistatic, with the second dose targeting mites that have hatched since the first treatment. Oral ivermectin is preferred for its convenience, ease of use, favorable side effect profile, and high compliance rates. The tablet form minimizes misuse or inadequate application compared to topical permethrin. Systemic ivermectin is particularly effective for treating scabies outbreaks, making it suitable for settings where individuals live in close proximity, such as homeless shelters, prisons, and healthcare facilities.

Other treatments include topical lindane, 5% precipitated sulfur, malathion, and topical ivermectin.

Treatment options may be limited by factors such as mite resistance, cost, availability, or potential toxicity, especially in pregnant women and children.

Treatment failure or recurrence is common and can often be attributed to not treating close contacts simultaneously, failing to decontaminate bedding and clothing during treatment, or nonadherence to the treatment regimen. Treatment failure in cases of crusted scabies may result from ivermectin-resistant Sarcoptes mites. In such cases, moxidectin is recommended for therapy [25].

Conclusion

Topical treatments play a critical role in the management of various skin diseases. They offer the advantage of direct application to affected areas, minimizing systemic absorption and reducing potential side effects. Successful treatment often requires patient education on proper application techniques and adherence to prescribed regimens. Regular follow-up with healthcare providers is essential to monitor progress, manage any adverse effects, and adjust treatments as necessary. When used correctly, topical therapies can significantly improve symptoms, enhance skin health, and boost the overall quality of life for patients with skin diseases.

Topical treatments play a crucial role in managing skin diseases, offering a range of benefits, including local treatment, ease of application, and effectiveness. By understanding the different types of topical treatments available, can better manage your skin disease and achieve optimal results. Remember to always consult with a healthcare professional before starting any new topical treatment regimen. skin diseases encompass a wide spectrum of conditions, each requiring specific approaches for effective management. From common issues like acne and eczema to more severe conditions such as psoriasis and dermatitis, understanding the underlying causes and triggers is crucial. Proper diagnosis and treatment, including topical medications, systemic therapies, lifestyle changes, and preventative measures, play significant roles in controlling symptoms and improving quality of life. Additionally, early detection and intervention are essential in preventing complications and long-term consequences. Collaborating with healthcare professionals ensures personalized care, empowering individuals to better manage their skin health and overall well-being.

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