

A Review on Skin Disease

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Abstract: Skin diseases are quite common and can be caused by various factors such as fungal infections, bacteria, allergies, and viruses. The use of lasers and Photonics in medical technology has improved the speed and accuracy of diagnosing skin diseases. However, the cost of such diagnosis can still be expensive. That's where image processing techniques come in, helping to create automated screening systems for dermatology. By extracting features from digital images of affected skin areas, we can classify different types of skin diseases. Our proposed method is simple, fast, and doesn't require expensive equipment. It involves resizing the image, extracting features using a pretrained convolutional neural network, and then classifying the features using Multiclass SVM. The results, including the type, spread, and severity of the disease, are presented to the user. This research contributes to the field of skin disease detection, which is particularly important in regions like Saudi Arabia where skin diseases are common due to deserts and hot weather.

Keywords: Skin disease, Fungal infection, Medical technology, Multiclass SVM, Digital images.

INTRODUCTION

Skin is amazing! It's the largest organ in our body and does so much for us. It protects us, helps regulate our body fluids and temperature, and allows us to sense our environment. Skin diseases are unfortunately very common, affecting around 900 million people worldwide at any given time. They can have a significant impact on individuals and communities, causing financial, socio-economic, and psychological burdens. In Africa, skin diseases affect a large percentage of children, ranging from 21% to 87%. These diseases can lead to feelings of depression, frustration, isolation, and even thoughts of suicide. The prevalence of skin diseases varies depending on environmental factors, hygiene, social customs, and genetics. In developing countries, infections and infestations are more common. There are over 3000 known skin diseases globally. In Ethiopia, common skin diseases include acne vulgaris, atopic dermatitis, lichen planus, onychomycosis, and tinea capitis. For example, atopic dermatitis affects about 20% of children under the age of two, and acne vulgaris can lead to long-term scarring in 95% of patients. Onychomycosis, a fungal infection of the nails, is prevalent worldwide, affecting approximately 5.5% of the population and accounting for 50% of all nail diseases. It's important to raise awareness about skin diseases and work towards effective prevention and treatment.

The current methods for diagnosing skin diseases can be quite challenging. They often rely on patient history, symptoms analysis, visual inspection, skin scraping, dermoscopic examination, and skin biopsy. However, these methods can be time-consuming, subjective, and require a lot of

experience from dermatologists. It's true that advanced medical imaging techniques can also be used for diagnosis, but they can be expensive and limited to specialized healthcare facilities. This means that people in low-resource settings may not have access to these services. It's important to find ways to make skin disease diagnosis more accessible and efficient for everyone.

Common skin diseases

1. *Acne*

Acne is a common skin condition that affects many teenagers. It starts during puberty and can last until a person reaches their 20s. However, some people may continue to have acne into their 40s and 50s. While it may seem like just a cosmetic issue, acne can have a significant emotional and psychological impact. It can lead to feelings of anger, fear, shame, anxiety, depression, and embarrassment. It can also result in bullying and social stigma. Acne can affect confidence, social interactions, job opportunities, and even lead to thoughts of suicide. It's important to address the emotional effects of acne, not just the physical symptoms.

2. *Skin cancer*

Skin cancer is increasing due to UV exposure from the depleted ozone layer. There are two main types: malignant melanoma and non-melanoma (including basal cell carcinoma and squamous cell carcinoma). BCC and SCC are caused by chronic UV exposure, while MM can be due to intense sun exposure and sunburn history. BCC and SCC make up about 80-85% of non-melanoma skin cancers, with SCC being more dangerous. Early-stage skin cancer is treatable, but advanced cases are harder to treat. BCC accounts for 80%, SCC for 16%, and melanoma for 4% of skin cancers. Early detection is crucial!

3. *Eczema*

You're absolutely right! Eczema, or atopic dermatitis, is the most common type of dermatitis. Both genetic factors and the environment can contribute to its development. While it's often seen in children, it can also affect adults. People with eczema typically have dry, itchy skin that is prone to infections. It's often referred to as the "itch that rashes" because scratching or rubbing can lead to a rash. Hydrating the skin is key, and for flare-ups, topical steroids are commonly used. It's important to take good care of the skin and manage symptoms to improve comfort and quality of life.

4. *Psoriasis*

Psoriasis is a skin disease that lasts a lifetime and is related to other health issues like psoriatic arthritis, psychological problems, cardiovascular diseases, and liver conditions. In 2014, the World Health Organization recognized psoriasis as a serious non-communicable disease. They also emphasized the distress caused by misdiagnosis, inadequate treatment, and the stigma associated with this condition. According to the Global Burden of Disease Study, psoriasis accounted for 5.6 million disability-adjusted life-years (DALYs) in 2016, which is at least three times higher than inflammatory bowel disease. It's a significant health concern, but there are treatments available to manage it.

5. *Rosacea*

Rosacea is a common skin condition that causes redness, bumps, visible blood vessels, swelling, and sometimes pus-filled pimples. It mostly affects the central face, like the cheeks, forehead, chin, and nose. People with rosacea may also experience flushing, stinging, pain, or burning sensations. There are different types of rosacea, and they can vary from person to person. The exact incidence and prevalence of rosacea can vary in different studies, but it's generally more common in adults over 30. However, it can also occur in childhood. While rosacea is commonly seen in fair-skinned individuals, it can also affect people of other skin types, including Asian and African populations.

6. Atopic dermatitis

Atopic dermatitis is a common, chronic, and inflammatory skin disease that mainly affects young children. Atopy refers to an inherited tendency to produce IgE antibodies in response to small amounts of common environmental proteins like pollen, dust mites, and food allergens. The term dermatitis comes from the Greek words for "skin" and "inflammation." Dermatitis and eczema are often used interchangeably, although eczema specifically refers to the acute form of the disease. There have been various names proposed for this condition, but atopic dermatitis is commonly used, even though not all patients with the disease have allergic sensitization or elevated IgE levels.

7. Chickenpox

Chickenpox is usually a childhood disease that tends to occur more frequently in late winter and early spring. However, in tropical and subtropical regions, it tends to peak during adolescence. Interestingly, in tropical countries, the seasonality of chickenpox doesn't occur. In the Czech Republic, chickenpox is one of the top reported infectious diseases according to the Epidat information system. The number of cases has been around 45,000 per year, with the disease typically occurring from November to June. I can provide you with more specific data if you'd like. Regarding transmission, chickenpox can easily spread among family members and schoolmates through airborne particles, droplets in exhaled air, and fluid from blisters or sores. It can also be indirectly transmitted by coming into contact with items exposed to fresh drainage from open sores. Patients are highly contagious a few days before and after the appearance of their rash. Once the sores have crusted over, the patient is usually no longer contagious.

Conclusion

It's interesting to learn that infectious skin diseases make up a significant portion of skin disorders in children. It's concerning that almost half of the cases were diagnosed as non-specific dermatitis. It sounds like there is a need for better dermatological training for pediatric residents. It's important to ensure that children receive the best possible care for their skin conditions.

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