

## A Study of Cutaneous Manifestations of Chronic Pulmonary Diseases among Patients Attending a Tertiary Care Hospital

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### Abstract:

**Background:** Patients who suffer chronically from lung diseases usually have associated dermatological conditions, which result in changes in the texture of cutaneous tissue.

**Aim:** This study aims to determine the changes that occur in the cutaneous tissue in patients with chronic lung diseases.

**Method:** The patients who visited the tertiary care centre suffering from chronic lung diseases were considered for the study. The skin, nails, and oral cavity were carefully observed for texture and pigmentation. All the changes were recorded and further classified according to the changes, such as pigmented skin and clubbed nails.

**Results:** Among 200 patients with chronic lung disease, changes in the skin were found. Extreme dry skin, thickening of stratum corneum, brittle and split nails, infection of the nails, pigmentation of the skin, and clubbed nails were the common observations in all these patients.

**Conclusion:** The changes in the skin were frequently observed in patients with pulmonary disease. If these changes are observed earlier, they can be managed along with the management of the pulmonary disease so that its progress can be prevented.

**Keywords:** Dry Skin, Cutaneous Changes, Chronic Pulmonary Disease, Brittle Nails.

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### Introduction

The diseases in the lungs manifest themselves into cutaneous changes that lead to dermatological diseases. A particular lung disease is associated with a particular dermatological disease, which helps understand the underlying condition and track its prognosis [1]. Various studies have reported the association of cutaneous manifestations with respiratory diseases [2-4].

Lung diseases are morbid, and early diagnosis can reduce the mortality rate. However, in certain pulmonary diseases, the symptoms do not manifest themselves as respiratory problems at an earlier stage; rather the cutaneous changes are visible [3]. A thorough examination of the cutaneous tissue can help devise a clinical management plan for treating pulmonary diseases at an earlier stage before they become fatal [4, 5].

Dermatological diseases are easier to identify, and investigation of them can help derive the prognosis of existing pulmonary diseases. Studies are required in this area to help clinicians correlate the occurrence of dermatological disease with respira-

tory disease and carry out further diagnostic procedures to confirm the respiratory problem and thus devise a proper clinical management plan.

Although the etiology of each association between pulmonary diseases and dermatological diseases is different, the occurrence and frequency of such associations can help treat patients in the future [6]. For example, in various studies, it has been reported that sarcoidosis can be associated with an underlying respiratory bacterial infection [7, 8].

The cutaneous manifestation is not easily identifiable because certain dermatological disease appears like the signs of aging skin. However, the severity of the dermatological disease, the rapidity with which they occur, and diagnosis of the pulmonary disease play a significant role. If the pattern of the cutaneous manifestation is understood clinicians can gain proficiency in identifying underlying morbid pulmonary disease.

Recognizing the pattern of dermatological diseases can help drive further diagnosis. This study is an

attempt to recognize these patterns and fill the existing knowledge gaps in the association between respiratory and dermatological diseases. In this study, we aim to record the cutaneous manifestations in the patients who have clinically confirmed a pulmonary disease, calculated the frequency of their occurrence, and thus correlated them.

### Methods

A total of 200 subjects with long-term respiratory illness were selected for the study. A pulmonologist thoroughly examined the subjects for existing pulmonary diseases. A questionnaire was curated to interview the subjects and get a detailed history. Subjects who did not consent to the study were eliminated. The cutaneous tissues, such as skin, nails, hair, and the oral cavity, were examined for dermatological disease. All the observations were recorded, and they were further classified based on texture changes in the skin, texture changes in the nails, texture changes in the oral cavity, pigmentation of the skin and infection of the skin and nails.

### Statistical analysis

The obtained data was systemically organized on the Microsoft excel sheets. Patients were classified on the basis of the pulmonary disease they had, and the frequency of such patients was calculated. The

patients were then classified on the basis of cutaneous manifestation and their frequency was calculated accordingly. Numerical values of the occurrence of cutaneous manifestation and the pulmonary disease and their correlation was determined.

### Result

Among the 200 people who consented to the study, the majority (137) were suffering from chronic obstructive pulmonary disease; 2 had a rare fungal infection of *Aspergillus* in the lung; 4 had cancer in the bronchi, 6 had scarring of the pulmonary tissue due to exposure to hazardous material; and 22 had asthma. Table no. 1 illustrates the summary of the patient's pulmonary disease.

The cutaneous tissue of the patients was thoroughly examined to determine the presence of dermatological disease. Various conditions were observed; those that were manifestations of the underlying pulmonary condition are illustrated in Table No. 1. Extremely dry skin was observed in the majority of the patients (96), clubbing of the nails was found in 86; thickening of the stratum corneum in the elbow region was seen in 66 patients; 70 of them had brittle and split nails; and 38 of them had a fungal infection in their nails. Some patients had two or more of the above-mentioned skin conditions, indicating the severity of the underlying lung diseases

**Table 1: summary of the pulmonary disease and its cutaneous manifestation**

<b>Pulmonary disease</b>	<b>No. of patients</b>
COPD	137
Scarring of lung tissue	06
Fungal infection in lung	02
Cancer	04
Asthma	22
<b>Cutaneous manifestation</b>	<b>No. of patients</b>
Extreme dry skin	96
Clubbing of the nail	86
Thickened stratum corneum in the elbow region	66
Brittle and split nails	70
Fungal infection in nails	80

There were other skin conditions also observed, but as the average age of the patients was 68 years and all the patients were above 45 years and below 82 years, they were age-related conditions and not because of the pulmonary disease. Itchy dermatitis, stains of tobacco on the nails, oral cavity pigmentation, pigmentation of the skin, eczema, purpura, and angioma are the skin conditions at this age.

### Discussion

When the data obtained is studied it is observed that the majority of the patients suffered from chronic pulmonary obstructive disease and among them, many patients had extremely dry skin [9]. Clinically, this condition is xerosis, and its association with chronic obstructive pulmonary disease is

evident from this study, which is consistent with many other such studies conducted.

In this study, several cases of nail conditions were also reported. The brittle, split nails and fungal infection of the nails are manifestations of the underlying pulmonary problem. However, the condition, such as pigmentation of the skin, is due to addiction. Since the patients who had stained nails were found to be addicted to smoking. Similarly, the pigmentation of the oral cavity was due to substance abuse and smoking and was not related to pulmonary diseases [10].

The thickening of the stratum corneum in the elbow region was found in 38% of cases of patients suffering from asthma and chronic pulmonary disease.

The association of the thickening of the stratum corneum with chronic obstructive pulmonary disease and asthma was found to be significant in the study [11, 12].

The other types of skin conditions, such as itchy dermatitis, eczema, purpura, and angioma, were age-related and had nothing to do with the underlying skin condition. From the above correlation, clinicians can determine the state of the underlying pulmonary diseases based on cutaneous examination. In various studies, a correlation between a particular skin condition and a particular respiratory problem has also been reported.

### Conclusion

The prevalence of skin condition as a manifestation of respiratory disease is evident from this study. More studies are required to understand the significance of this correlation and thus devise a management plan to treat both the pulmonary disease as well as the cutaneous condition.

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