Int. j. adv. multidisc. res. stud. 2024; 4(6):807-810

Received: 21-10-2024
Accepted: 01-12-2024

International Journal of Advanced Multidisciplinary Research and Studies

ISSN: 2583-049X

Study of Exfoliative Dermatitis: A Review

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DOI: https://doi.org/10.62225/2583049X.2024.4.6.3515
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Abstract

Exfoliative Dermatitis (ED) is a rare, severe, and widespread inflammatory skin disorder characterized by widespread erythema, scaling, and desquamation of the skin. It can be induced by a variety of factors including systemic diseases, medications, infections, and underlying dermatological conditions. This review aims to consolidate existing knowledge on the etiology, pathophysiology, clinical presentation, diagnostic approach, and management strategies for ED. The condition can present acutely or chronically and may be associated with significant morbidity due to fluid and electrolyte imbalance, secondary infections, and potential systemic involvement. Early recognition and timely intervention are crucial to improving patient outcomes. Treatment primarily involves addressing the underlying cause, along with symptomatic management, including systemic corticosteroids and immunosuppressants in severe cases. Despite advancements in treatment, ED continues to present diagnostic and therapeutic challenges, necessitating further research into its pathogenesis and optimal management protocols. This review provides an in-depth understanding of ED, highlighting the need for multidisciplinary care in its management.

Keywords: Exfoliative Dermatitis, Diagnostic Approach, Therapeutic Challenges, Management Strategies and Multidisciplinary Care

1. Introduction

Exfoliative dermatitis is an inflammatory skin disorder that affects most or all of the skin's surface and is characterized by erythema and scaling. The incidence of this rare condition ranges from 1 to 71 per 100,000 people with dermatology [1]. Though the underlying reason may occasionally remain unknown even after extensive clinical study, its incidence may be linked to other skin or systemic illnesses as well as, frequently, drug use. Additionally, exfoliative dermatitis may be linked to neoplastic conditions including Sézary syndrome and cutaneous T-cell lymphomas [2, 3].

Despite having low death rates, exfoliative dermatitis has a high morbidity rate since it is frequently a chronic condition with incapacitating symptoms such severe itching and scaling. Therefore, it is crucial to try to identify the cause of exfoliative dermatitis in patients so that each case can receive early, appropriate care [4].

Fig 1: Exfoliative Dermatitis in Hand

An inflammatory skin condition called exfoliative dermatitis is typified by erythema and scaling that nearly cover the entire body. Over 90% of the body is often affected by this illness [11]. It might be difficult to identify the cause of exfoliative dermatitis because it can be brought on by a number of systemic and cutaneous conditions. Infection with dermatophytes is one of the less frequent causes of adult exfoliative dermatitis [15].

A dermatophyte-induced infection of the skin, hair, and nails is known as dermatophytosis. The three dermatophyte genera are Trichophyton, Microsporum, and Epidermophyton. Globally, dermatophytosis is the most prevalent superficial fungal infection. It affects roughly 3.6% of people who have skin conditions [7]. The disease is especially prevalent in tropical nations and high-humidity regions. Dermatophytosis is most frequently caused by Trichophyton rubrum (T. rubrum) and T. mentagrophytes in Indonesia.About 4% of people have infection-induced exfoliative dermatitis. This report aimed to illustrate an unusual example of dermatophytosis-related exfoliative dermatitis [10].

In a sample of patients admitted to a teaching hospital's dermatology section, the aim of this study is to determine and examine the primary causes of exfoliative dermatitis [16].

Fig 2: Exfoliative Dermatitis in Leg

2. Drug Induced Exfoliative Dermatitis

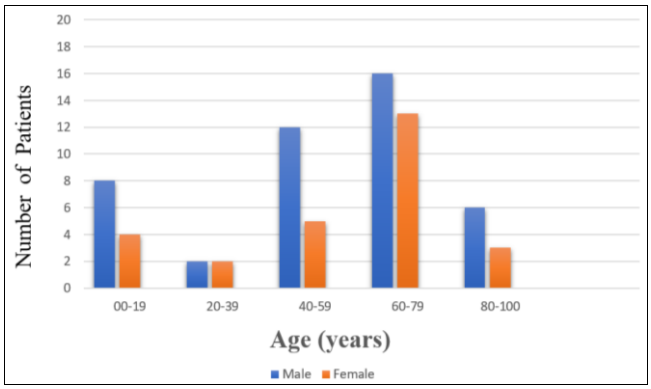
2.1 Background:

The overall incidence of cutaneous drug eruptions in hospitalized patients is 2-3%, making them one of the most prevalent forms of adverse drug reactions. Drug-induced exfoliative dermatitis, in particular, is an uncommon and more severe drug hypersensitivity reaction that affects the skin and mucous membranes [5]. It often manifests days to weeks after drug exposure.The primary clinical manifestations of druginduced exfoliative dermatitis include toxic epidermal necrolysis, erythema multiforme, and StevensJohnson syndrome [18].

In general, the main actor in these immunemediated drug responses is T cells. It is possible to differentiate StevensJohnson syndrome from widespread bullous drug eruption using immunohistopathological characteristics [8]. Efficacy has not yet been established, and therapy indication, selection, and dosage are still unknown. Here, we present a comprehensive analysis of the prevalence, risk factors, cellular and molecular mechanisms of reactions, clinical characteristics, diagnostic procedures, and treatment modalities of druginduced exfoliative dermatitis [13].

2.2 Epidemiology:

Results from epidemiological research on toxic epidermal necrolysis syndromes, Steave Johnson syndrome, and erythema multiforme vary, most likely due to a number of biases, including variations in diagnostic standards, ethnicity, and drug use in various socioeconomic contexts. Erythema multiforme has a reported prevalence of less than 1%, notwithstanding the absence of epidemiologic data on the condition [14]. According to a number of writers, the number of hospitalizations for Erythema multiforme varies from 0.4 to 6 cases per million people in northern Europe to around 40 cases per million people in the US annually.Women are more likely than men to have erythema multiforme, which often affects young adults between the ages of 20 and 40 (1.5:1.0). A genetic propensity exists for specific Asian ethnicities, and recurrence happens in about one-third of instances. Nearly 65% of patients could have mucosal involvement. The death rate from Erythema multiforme is not widely documented [17].



Graph 1: Age and Sex distribution of Exfoliative dermatitis

The most prevalent condition is Steaven Johnson syndrome, which has an annual incidence of 2 to 7 cases per million people due to toxic epidermal necrolysis. It has been estimated that the risk of Steaven Johnson syndrome and

toxic epidermal necrolysis is 1,000 times higher in HIV patients, around 1 in 1000 annually. The death rates for Steaven Johnson syndrome and toxic epidermal necrolysis are from 5% to 12.5%, respectively, indicating a low prevalence. With a male to female ratio of 0.6, they generally affect women more often. Overall, the mortality rate is about 30%, with the survival rate getting worse until a year after the start of the disease. This ranges from 10% for SJS to over 30% for toxic epidermal necrolysis [6].

3. Exfoliative Dermatitis in Cats:

A clinical condition known as exfoliative dermatitis is typified by widespread, severe desquamation, either with or without erythema.Systemic lupus erythematosus, drug eruptions, epitheliotropic T-cell lymphoma, erythema multiforme, cheyletiellosis, demodicosis, Malassezia dermatitis, dermatophytosis, feline immunodeficiency virus or feline leukemia virus dermatitis, parapsoriasis, sebaceous adenitis, and paraneoplastic syndrome because of thymoma are among the differential diagnosis of this uncommon finding in cats [19].

Fig 3: Exfoliative Dermatitis in Cat

The latter is poorly understood, and there is no thorough histologic description of the ailment. Parakeratosis and a cell-poor interface dermatitis are the main histologic alterations that are discussed in the literature.In cats, thymomas are generally linked to a nonpruritic, generalized exfoliative dermatitis, suggesting a similar association [9].

4. Patents available for ED:

Table 1: Patents available for ED

S. No	Authors	Tittle	Patent	Submission Date	Publication Date
1	Christopher Powala, Luis Rios	Pharmaceutical cream compositions comprising oxymetazoline	AU2018229508B2	2018-09-13	2020-06-25
2	Stuart D. Shanler	Pharmaceutical cream compositions of oxymetazoline and method of use	US11541000B2	2019-11-04	2023-01-03
3	Audra Lynn Stinchcomb, Stan Lee Banks	Transdermal formulation of cannabidiol comprising a penetration inhancer and methods of using the same	CA2760460C	2010-04-28	2019-04-02
4	Meir Eini, Dov Tamarkin	Pharmaceutical composition for topical application	US8512718B2	2010-02-12	2013-08-20
5	Steven GOURLAY	Treatment of Pemphigus	AU2015364335B2	2015-12-18	2020-11-26
6	Ronald Aung-Din	Topical regional neuro-affective therapy with cannabinoids	US10716766B2	2016-03-02	2020-07-21
7	Michelle D. Hines, Tiffany Florence	Botanical Formulation	US9561198B2	2014-04-30	2017-02-07
8	Brian Goodman, Holly ponichtera	Compositions and methods for treating disease using a Blautia strain	US10493113B2	2018-11-14	2019-12-03
9	Joseph Collard, Olga Khorkova Sherman	Treatment of Collagen gene related disease by inhibition of natural anty sense transcript to a collagen gene	US10370657B2	2016-11-29	2019-08-06
10	Richard L. Beard, John E. Donello	Use of agonist of formyl peptide receptor 2 for trearing dermatological disease	AU2019201538B2	2019-03-06	2021-02-18

5. Discussion

In laboratory settings, patients with exfoliative dermatitis typically exhibit varying degrees of general health impairment, including anemia, malnourishment, and other metabolic issues. Laboratory abnormalities, including anemia, eosinophilia, hypoproteinemia, and an increase in serum creatinine, were seen in the study's subjects [21].

In terms of age, exfoliative dermatitis is most frequently observed in those over 50, however it can be detected as early as the newborn period, when prevalence is low. Males had a higher incidence, according to earlier research. The proportion of patients over 40 in this study was significantly higher (48–58, 82.75%) than the proportion of patients under that age ($p<0.05$). Although men outnumbered women (37/58), this difference was not statistically significant ($p>0.05$) [12].

Sometimes it is impossible to determine the cause of exfoliative dermatitis in every instance. Because alterations unique to dermatosis or medication reactions are sometimes obscured by unspecific changes brought on by exfoliative dermatitis, there is typically little association between the etiology and the clinical presentation in this condition. As a result, multiple biopsies may be required for a definitive clinical-histological association [24].

The percentage of cases submitted for biopsy that had a final etiologic diagnosis based on histology ranged from 15%10 to 43% in several worldwide studies. 37 individuals (72.54% of cases submitted for biopsy) in this study had histology assist with the final diagnosis. Patient characteristics, which differ depending on the service, could be the cause of the discrepancy observed across studies. However, it is evident how crucial the histopathologic analysis is in identifying the cause of exfoliative dermatitis [25].

6. Conclusion

Dermatophytosis-induced exfoliative dermatitis is quite uncommon. Patients using oral corticosteroids over an

extended period of time may experience it. Exfoliative dermatitis etiology ought to be decided in order to administer a suitable treatment. It is necessary to determine the cause of exfoliative dermatitis, a secondary phenomenon, before a prognosis can be made. Due to the great variability of the etiological causes, each case requires a thorough study. It is a disease of the middle-aged and old; that is, it happens when other contributing illnesses, such as cancer, are prevalent, even if it is sometimes observed in infancy and frequently has a deadly end. After it starts, it can persist anywhere from three months to many years, and in order to keep it under control, intensive therapy is required.

7. Acknowledgement
The authors thankful to Rungta Institute of Pharmaceutical Sciences and Research, Bhilai, Chhattisgarh and Rungta Institute of Pharmaceutical Science, Bhilai, Chhattisgarh for providing necessary facilities and database

8. Conflict of Interest
The authors declare that no conflict of interest of any financial or other issues.

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