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Original Article

Clinical Etiology and Histopathologic Correlation of Exfoliative Erythroderma at the Kenyatta National Hospital

Karen Waithera Wainaina[1], Priscilla Angwenyi[1] & Beatrice Wangari Ndege[2]*

[1] Jomo Kenyatta University of Agriculture and Technology, P. O. Box 62000-00200, Nairobi, Kenya.
[2] Kenyatta National Hospital, P. O. Box 20723-00202, Nairobi, Kenya.
*Author for Correspondence Email: karenwaithera@gmail.com

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Exfoliative erythroderma, Dermatology, Malignancy, Psoriasis, Dermatosis.

ABSTRACT

Background: Exfoliative erythroderma is a dermatologic emergency characterised by diffuse skin redness and scaling involving at least 70% body surface area. It is a clinical presentation that is usually indicative of an underlying primary process. Once a clinical diagnosis of exfoliative erythroderma is made, prompt supportive measures should be instituted while seeking to identify the underlying cause of this presentation. The correlation between clinical and histopathological diagnoses has not been determined for the Kenyan population. **Purpose of the study:** To assess the frequency of causes of exfoliative erythroderma and their histopathologic correlation at Kenyatta National Hospital. **Methodology**: This was an ambispective study conducted in Kenyatta National Hospital wards and clinics. All adult patients with exfoliative erythroderma who meet the study criteria will be included. A total sample size of 94 patients was included in the study. Descriptive analysis was done where demographic, clinical and histopathological factors were summarised using mean and standard deviation as well as median and interquartile range. A sensitivity analysis was performed to correlate clinical findings and histopathological findings. **Results:** The median age was 45 (interquartile range: 30 – 60 years, and 53% of them were male. Clinical causes of EE revealed that most of the patients with EE were due to psoriasis (38.3%), followed by malignancies (21.3%) and eczema (18.1%). Clinical findings revealed that the common causes of EE included dermatoses (57.45%), with psoriasis (24.2%) followed by eczema (18.1%). Malignancies (21.3%) were the second most common group and the commonest systemic disease, followed by drug reactions (12.7%). HIV was present in 7.5% of the cases. The findings showed that 63% (n =57) of the patients had a biopsy done, although the frequency was lower in the retrospective arm, 57% (n =42), compared to the prospective arm of the study, 88% (n =15). The findings from the histopathological findings revealed that 39.2% were malignancies, followed by psoriasis 25.5%) and immunobullous disease (17.7%). The sensitivity analysis revealed that immunobullous (100%) and malignancy (92.3%) had a high level of sensitivity as well as specificity, which was 97.7% and 92.6%, respectively, although eczema and psoriasis were least correlated with histopathological findings. **Conclusion:** Clinical findings were better correlated with malignancy and immunobullous findings with high sensitivity and specificity, although the other

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histopathology findings, such as psoriasis and eczema, were poorly correlated. Thus, there is a continued need to adopt a biopsy-first protocol for all new presentations of EE to maximise diagnostic yield.

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INTRODUCTION

Exfoliative erythroderma, also known as exfoliative dermatitis or Red Man Syndrome, is a dermatologic emergency characterised by diffuse skin redness and scaling that involves at least 70% of the body surface area (BSA) (Austad & Athalye, 2025). This condition is often indicative of an underlying primary process, making it crucial to identify the root cause to mitigate recurrences, complications, and the associated mortality risk (Miyashiro & Sanches, 2020).

The diagnostic criteria for exfoliative erythroderma consistently include diffuse erythema and scaling affecting >70% of the body surface area (César et al., 2016). Once the condition is clinically diagnosed, immediate supportive measures are necessary while determining the underlying cause. In some straightforward cases, such as drug reactions, the diagnosis can be made clinically (Hoxha et al., 2020). However, a skin biopsy is often required, especially in cases of suspected cutaneous malignancies or idiopathic exfoliative erythroderma, to guide management (César et al., 2016).

The etiologies of exfoliative erythroderma can be categorised into congenital causes, such as congenital ichthyoses, and acquired causes. The acquired causes are further divided into underlying dermatoses, drug reactions, systemic diseases, idiopathic, and other less common factors (Hoxha et al., 2020). Understanding these underlying causes is essential for appropriate treatment and reducing the risks associated with the condition.

Globally, the frequency of exfoliative erythroderma has not been well characterised. The most recent study from Kenya reported an incidence of 13% (Munyao et al., 2008). Universal findings across Europe and Asia found varying incidence from as low as 0.035% in outpatient dermatology settings to 11.9% in hospitalised patients (Austad & Athalye, 2025). It often presents with a mean age of onset between 42 to 62 years, with a male preponderance. Dermatoses, particularly psoriasis, have been identified as the leading clinical cause globally, but atopic eczema was shown to be predominantly associated with erythroderma in Kenya at 83% (Munyao et al., 2008).

Drug reactions are a significant underlying cause of exfoliative erythroderma across all regions.

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César et al. (2016), in a retrospective study of the clinical and laboratory profile of all patients with erythroderma in Portugal, found that allopurinol and carbamazepine were the main offending drugs (Munyao et al., 2008). In an Argentinian hospital study, it was noted that vancomycin was the primary causative drug in erythroderma patients (Di Prinzio et al., 2022). Munyao et al. (2007) noted that drug-associated erythroderma accounted for about 14% of the total cases in a Kenyan tertiary hospital. Systemic diseases contributing to exfoliative erythroderma included malignancies such as Sezary syndrome, cutaneous T-cell lymphoma, gastric, and lung cancer (César et al., 2016; Hoxha et al., 2020). HIV and malignancies, including prostate carcinoma, leukemia, multiple myeloma, and non-Hodgkin lymphoma, are some other systemic diseases that have been strongly associated with erythroderma (Munyao et al., 2008). Idiopathic causes may account for about 3.9% of cases (César et al., 2016).

Histopathologic examination through skin biopsy plays a crucial role in diagnosing exfoliative erythroderma, with reported diagnostic accuracy ranging from 48-66% (Austad & Athalye, 2025). César et al. (2016) found that biopsies were useful in establishing a diagnosis in about two-thirds of their cases. El-Hamd et al. (2022) reported high clinical and histopathologic correlation rates for various etiological pathologies for erythroderma, with psoriasis being the leading pathologic diagnosis (El-Hamd et al., 2022).

Laboratory parameters in exfoliative erythroderma also tend to be nonspecific but are useful in diagnosing and managing complications. Common findings include elevated acute inflammatory markers (ESR, CRP), rising urea and creatinine levels, low albumin levels, leukocytosis with eosinophilia, deranged blood sugar levels, and mild anaemia (Deka et al., 2015; El-Hamd et al., 2022). Munyao et al. (2007) also found low haemoglobin, lymphocytosis, and hypoalbuminemia in most of their patients.

The complexity of exfoliative erythroderma, with its myriad of potential causes and varying clinical presentations, underscores the importance of this study. By investigating the correlation between the clinical causes of exfoliative erythroderma and histopathologic findings at Kenyatta National Hospital, this research aims to enhance diagnostic accuracy and improve patient outcomes. This study aims to assess the frequency of causes of exfoliative erythroderma and their histopathologic correlation at Kenyatta National Hospital. Therefore, the study sought to assess the correlation between the clinical causes of EE and their histopathologic diagnoses at KNH.

METHODS AND MATERIALS

Research Design

This was an ambispective study utilising both retrospective and prospective designs. Retrospective data was obtained for a period between January 2020 to January 2025, while the prospective arm of the study was done between February 2025 to April 2025.

Study Setting

The study was conducted at the Kenyatta National Hospital. This is the region's largest tertiary referral facility, boasting a bed capacity of 2,400 and a staff count of up to 6,000. Located within Nairobi County, the hospital is found in the city's upper hill area. The KNH is a Level 6 facility, acts as a referral centre for complicated medical problems and specialist treatments on a national and regional level. Patients are often referred to KNH from other lower-level healthcare facilities across the country. As a Level 6 hospital, KNH is equipped with state-of-the-art facilities and offers a wide range of medical services across various disciplines. The Department of Medicine at KNH is a key division within the hospital, offering comprehensive healthcare services across several specialised units. Within this department, the Dermatology Unit plays a crucial role in the diagnosis, treatment, and management of patients with various skin conditions. The Dermatology Unit provides care through both inpatient and outpatient services, including specialist clinics that cater to a wide range of dermatological conditions.

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Study Population

The study population consisted of all adult patients seen at Kenyatta National Hospital who were confirmed to have skin scaling, exfoliation, and erythema affecting 70% body surface area or more. This included both new and existing patients who consented to participate in the study. Patients with cognitive dysfunction, since they might struggle to understand the study process, potentially making informed consent challenging, having incomplete medical records, which were defined as undocumented pathology findings, were excluded from the study.

Sample Size Determination

The sample size for this study was calculated based on the prevalence of exfoliative erythroderma as reported in previous studies. Mahajan et al. (2021) reported a clinicopathological correlation of 78.3% among dermatologic admissions at Kenyatta National Hospital. Using this prevalence rate and aiming for a confidence level of 95% with a margin of error of 5%, the sample size can be determined using the formula for estimating proportions a sample size of 260 was obtained and corrected using a correction factor considering that the total population was known (N =146) giving a sample size of 94. Of these, 4/5 (75 patients) were included in the retrospective arm while 1/5 (19 patients) were included in the prospective arm. This division was justified by the study duration and data from the records department in KNH, which shows that on average, 19 new patients are seen in the dermatology unit with a diagnosis of exfoliative erythroderma.

Sampling Procedure

The study used a consecutive sampling method, which involved including all eligible patients who presented to the dermatology department and were diagnosed with exfoliative erythroderma during the study period.

For the retrospective analysis, all files meeting the inclusion criteria with an indicated diagnosis of exfoliative erythroderma were assumed to meet the body surface area requirements, as has been the tradition in the dermatology unit (90%).

Recruitment Procedure

Recruitment was conducted by the principal investigator with the help of research assistants. The research assistants underwent thorough training specific to the study's requirements. The training program focused on equipping the research assistants with the necessary skills to identify eligible participants, obtain informed consent, and collect data in a manner that ensured accuracy and consistency. The principal investigator and the research assistants had all undertaken online Good Clinical Practice Training and applied these principles during the study. All patients presenting to the dermatology department at Kenyatta National Hospital, who had been screened by the principal investigator for symptoms consistent with exfoliative erythroderma, were approached at each respective study area. Eligible patients were approached to participate in the study. The study objectives, procedures, potential risks, and benefits were explained in detail. Written informed consent was obtained from all participants before inclusion in the study. Patients who provided informed consent were enrolled in the study and assigned a unique study identification number for confidentiality and data management purposes. Skin biopsies were then obtained for those who consented to the procedure after risks and benefits had been explained. The cost for outsourcing analysis for these skin biopsies was borne by the study. The patients were educated on wound care and received the skin biopsy results at the earliest available opportunity. Any complications from the skin biopsy were documented in real time, and the ethics and research committee were notified within 15 calendar days. Any severe adverse effects, such as severe drug reactions to the local anesthetic, were reported to the ethics and research committee within 7 calendar days.

For the retrospective arm, the principal investigator and the research assistants obtained data from patient records in Kenyatta National Hospital between January 2020 and January 2025

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after obtaining a waiver from consent from the ethics and research committee.

Data Collection Procedure

For the prospective arm, patients attending the outpatient specialist clinics or admitted to the inpatient wards within the Dermatology Unit were screened by the principal investigator to identify those who met the inclusion criteria. The clinical diagnosis underlying the patient's exfoliative erythroderma was also recorded.

Relevant clinical data, including demographic information, medical history, and findings from the clinical assessment, were recorded on standardised data collection forms by the research assistants or the principal investigator. The principal investigator then performed skin biopsies on all patients in the prospective arm who consented to the skin biopsy. The sample obtained was fixed in 10% neutral formalin, stored and transported at room temperature before being sent to the laboratory within 1 day.

The skin biopsies were sent to Sonar Laboratory for assessment by a dermatopathologist. They were reviewed and cosigned by a pathologist with experience with skin biopsies in the same laboratory. Histology and any special stains as deemed necessary were done. All costs for this outsourced analysis were covered by the study. The skin biopsy findings were recorded and correlated with the clinical diagnosis.

For the retrospective arm, all files with a recorded discharge or admission diagnosis of exfoliative erythroderma between January 2020 and January 2025 were assessed by the principal investigator or the research assistants. Demographic data, clinical presentation, and skin examination findings, including body surface area involvement, were obtained from the clinical notes. Body surface area involvement has traditionally been assumed to be 90% in the KNH dermatology unit for exfoliative erythroderma. Where a particular body surface area had not been recorded but the diagnosis captured was exfoliative erythroderma, 90% body surface area was assumed to be the case over this 5-year retrospective period. Where skin biopsies had been done, these were recorded and correlated with the clinical diagnosis. For cases where skin biopsies had not been done, the clinical diagnosis was captured, and the file was included in the analysis so as to assess the frequency of skin biopsies done for exfoliative erythroderma in KNH, as well as the underlying causes for which skin biopsies are traditionally not done in KNH.

There was no overlap between these two groups of participants. Only new cases were picked for prospective cases. Unique identifiers were put in patient files for all analysed files in the retrospective arm to avoid multiple analyses of a single case.

Quality Assurance

Ensuring high-quality data is critical for the validity and reliability of this study on exfoliative erythroderma at Kenyatta National Hospital. Several measures were implemented to maintain rigorous quality assurance throughout the study. Firstly, all data collection procedures followed standardised protocols detailed in the study manual. The research assistants recruited for this study had a minimum qualification of a diploma in nursing. The assistants were trained on the data collection process. Pre-testing of the data collection form and procedures was conducted with 10% of the sample of patients to identify potential issues in the data collection process and to refine the study tools and procedures. Periodic calibration exercises were conducted to maintain consistency in data collection and assessment.

Regular monitoring visits were conducted by the principal investigator and study coordinators to supervise data collection activities, ensuring compliance with the study protocols and addressing any deviations promptly.

Data Management

Data collected on standardised forms was coded and entered into a secured electronic Microsoft Excel workbook by the trained research assistants. During the data entry, cross-verification and identification of discrepancies were implemented. After data entry, a comprehensive data cleaning

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process was undertaken, which involved checking for missing values and outliers, verifying logical consistency (e.g., age consistency with date of birth, lab results within expected ranges), and cross-checking key variables against source documents to ensure accuracy and consistency. Each of the responses was serialised to ensure that it was accurately entered and could be traced. The collected data were then entered into SPSS version 27 for statistical analysis.

Data Storage and Archival

All paper forms and physical data were stored in locked, secure cabinets accessible only to authorised personnel. Electronic data was stored in a secure, password-protected database. Only the principal investigator, statistician, and study supervisors had access to the data. Different levels of access were assigned based on the role of the staff members, ensuring that only relevant information was accessible as per their responsibilities. Patient identifiers were separated from the main dataset and stored in a secure location. Unique study identification numbers were used in the database to ensure patient anonymity. Regular backups of the electronic database were performed to prevent data loss. Backup files were stored in a separate secure location. Incremental and full backups were scheduled on a daily and weekly basis, respectively. Only the principal researcher had the right to share the study dataset with any other interested party for learning and knowledge management. The data was stored for five years, after which the hardcopy papers were shredded, and the soft copy data was stored in the repository.

Data Analysis

Data was analysed using both descriptive and inferential analysis. All statistical analyses were performed using the standard SPSS version 27 statistical software package. Categorical data were grouped and analysed in terms of frequencies and percentages, while continuous variables were assessed using mean and standard deviation. Descriptive statistics were used to summarise the demographic and clinical characteristics of the study population. Measures such as means, medians, standard deviations, and frequencies were reported as appropriate.

The agreement between clinical and histopathologic diagnoses was assessed using kappa statistics. Sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV) of histopathologic findings in diagnosing underlying causes were calculated. The level of significance was assessed at the 0.05 level of significance.

Ethical Consideration

Ethical approval was sought from the Kenyatta National Hospital/University of Nairobi Ethics and Research Committee (KNH/UoN-ERC) reference Number: P716/09/2024

RESULTS

A total of 94 EE patients were recruited into the study, 75 of them retrospectively retrieved from patient records and 19 prospectively obtained through consented patients.

Characteristics of Exfoliative Erythroderma and Their Histopathologic Correlation at Kenyatta National Hospital.

The median age was 45 (interquartile range): 30 – 60 years, and 53% of them were male. In investigating the level of education, 48% of them had secondary level education, as shown in Table 1.

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Table 1: Characteristics of Exfoliative Erythroderma and Their Histopathologic Correlation at Kenyatta National Hospital.

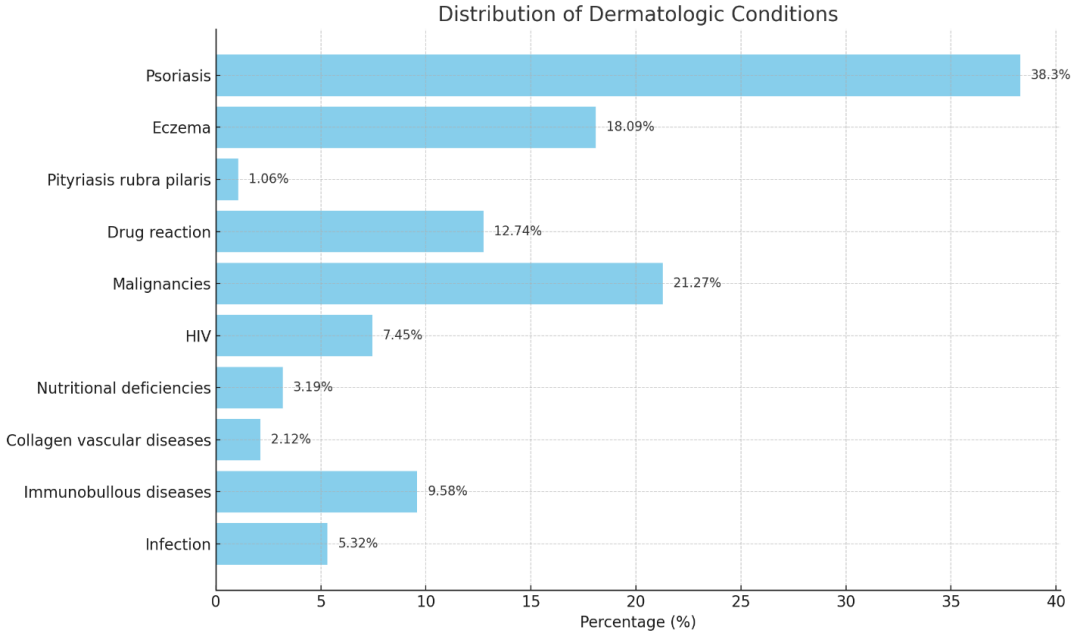
Characteristic	Overall, N = 94[1]	Prospective, N = 19[1]	Retrospective, N = 75[1]
Age(years)	**45** (30, 60)	54 (34, 64)	42 (28, 60)
Gender			
Female	41 (44%)	3 (16%)	38 (51%)
Male	**53 (56%)**	16 (84%)	37 (49%)
Education level			
Illiterate	2 (2.2%)	0 (0%)	2 (2.6%)
Not indicated	3 (3.2%)	0 (0%)	3 (4.0%)
Primary	18 (19%)	3 (16%)	15 (20%)
Secondary	**45 (48%)**	9 (47%)	36 (48%)
Tertiary	26 (28%)	7 (37%)	19 (25%)
Marital status			
Married	**54 (57%)**	11 (58%)	43 (57%)
Separated	3 (3.2%)	0 (0%)	3 (4.0%)
Single	25 (27%)	5 (26%)	20 (27%)
Widowed	12 (13%)	3 (16%)	9 (12%)
Current occupation			
Business	8 (8.5%)	3 (16%)	5 (6.7%)
Farmer	16 (17%)	3 (16%)	13 (17%)
Not indicated	1 (1.1%)	0 (0%)	1 (1.3%)
Retired	10 (11%)	1 (5.3%)	9 (12%)
Semis-skilled/informal	8 (8.5%)	4 (21%)	4 (5.3%)
Student	18 (19%)	2 (11%)	16 (21%)
Teacher	4 (4.3%)	2 (11%)	2 (2.7%)
Unemployed	**29 (31%)**	4 (21%)	25 (33%)
Previous occupation			
Farmer	**25 (49%)**	11 (69%)	14 (40%)
Semis-skilled/informal	24 (47%)	5 (31%)	19 (54%)
Teacher	2 (3.9%)	0 (0%)	2 (5.7%)

[1]Median (IQR); n (%)

Clinical Causes of EE

Most of the patients with EE were due to psoriasis (38.3%), followed by malignancies (21.3%), eczema (18.1%) and drug reaction (12.7%), as shown in Figure 1.

Figure 1: Clinical Causes of EE



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Clinical Causes of EE

The common causes of EE included dermatoses (57.45%), with psoriasis (24.2%) followed by eczema (18.1%). Malignancies (21.3%) were the second most common group and the commonest systemic disease, followed by drug reactions (12.7%). HIV was present in 7.5% of the cases in our study, as shown in Table 2.

Table 2: Clinical Causes of EE

Characteristic	N	%
Psoriasis	**18**	**24.2**
Pustular	4	4.26
Unstable	3	3.19
Erythrodermic	9	9.57
Plaque	2	2.13
Eczema	**17**	**18.09**
Pityriasis rubra pilaris	**1**	**1.06**
Total dermatoses	**36**	**57.45**
Drug reaction	**12**	**12.74**
Gemcitabine	1	1.06
Methotrexate	1	1.06
Carbamazepine	2	2.13
B-lactam	1	1.06
TMP-SMX	1	1.06
Terbinafine	2	2.13
Isoniazid	1	1.06
IV contrast	1	1.06
Depo	1	1.06
Herbal therapies	1	1.06
Malignancies	**20**	**21.27**
Cutaneous T cell lymphoma (unspecified)	5	5.32
Sezary syndrome	1	1.06
Mycosis fungoides	14	14.89
HIV	**7**	**7.45**
Nutritional deficiencies		
Pellagra	**3**	**3.19**
Collagen vascular diseases	2	2.12
SLE	1	1.06
Dermatomyositis	1	1.06
Immunobullous diseases	**9**	9.58
Pemphigus vulgaris	3	3.19
Pemphigus foliaceous	2	2.13
Bullous pemphigoid	4	4.26
Infections	5	5.32
Scabies	1	1.06
Impegnitized|HSV	4	4.26

Frequency of Skin Biopsy

The findings showed that 63% (n =57) of the patients had a biopsy done, although the frequency was lower in the retrospective arm, 57% (n =42), compared to the prospective arm of the study, 88% (n =15)

Histopathologic Findings of Clinically Diagnosed EE

The findings from histopathological findings revealed that 39.2% were malignancies, followed by psoriasis 25.5%) and immunobullous disease (17.7%), as shown in Table 3.

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Table 3: Histopathologic Findings of Clinically Diagnosed EE

	N	%
Psoriasis	13	**25.49%**
Pustular	3	5.88%
Psoriasis (unspecified)	5	9.80%
Erythrodermic	3	5.88%
Plaque	2	3.92%
Eczema	7	13.73%
Pityriasis rubra pilaris	1	1.96%
Malignancies	20	**39.22%**
Cutaneous T cell (unspecified)	3	5.88%
Sezary syndrome	1	1.96%
Mycosis fungoides	10	19.61%
Non-specific dermatitis	6	11.76%
Collagen vascular diseases	1	1.96%
Dermatomyositis	1	1.96%
Immunobullous diseases	9	**17.65%**
Bullous pemphigoid	4	7.84%
Pemphigus vulgaris	3	5.88%
Pemphigus foliaceous	2	3.92%
TOTAL	51	100.00%

Correlation between Clinical Findings and Histopathological Findings

Level of Agreement

The findings showed that immunobullous had an almost perfect agreement with a kappa value of 0.89, while malignancy showed substantial agreement (0.73), as shown in Table 4.

Table 4: Level of Agreement

	Kappa statistic	P value
Psoriasis	0.43	<0.001
Malignancy	0.73	<0.001
Eczema	0.15	0.107
Immunobullous	0.89	<0.001

Sensitivity Analysis of Clinical Findings and Histopathological Findings

The findings from correlation analysis revealed that immunobullous (100%) and malignancy (92.3%) had a high level of sensitivity as well as specificity, which were 97.7% and 92.6%, respectively, although eczema and psoriasis were least correlated with histopathological findings, as shown in Table 5.

Table 5: Correlation between clinical findings and histopathological findings

	Sensitivity (95%CI)	Specificity (95%CI)	NPV (95%CI)	PPV (95%CI)
Psoriasis	64.3(35.1, 87.2)	86.3(76.7, 92.9)	93.2(87.2, 96.6)	45.0(2.4, 61.6)
Malignancy	92.3(64.0, 99.8)	92.6(84.6, 97.2)	98.7(91.4, 99.8)	66.7(47.7, 81.4)
Eczema	37.5(8.5, 75.5)	84.8(75.5, 91.7)	93.6(89.4, 96.2)	18.8(7.6, 39.2)
Immunobullous	100(66.4, 100)	97.7(91.8, 99.7)	100(95.7, 100)	81.8(53.4, 94.7)

DISCUSSION

The current findings revealed that dermatoses were the most common cause of erythroderma (EE), accounting for 57.45%, with psoriasis being the leading cause at 24.2%, followed by eczema at 18.09%. Malignancies contributed to 21.27%, while drug reactions accounted for 12.74%. These

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findings are consistent with previous studies, such as a study in India, where psoriasis was identified as the most prevalent pre-existing dermatosis causing erythroderma, found in 45.4% of cases (Amrutha et al., 2021). Likewise, a study in Iran reported that dermatoses were the most common causative factor (59.7%), followed by drug reactions (21.6%), malignancies (11.3%), and idiopathic causes (7.2%) (Akhyani et al., 2005). Both studies used a cross-sectional approach similar to ours and conducted clinical, laboratory, and biopsy reviews of erythroderma cases, supporting the validity of our findings. This synthesis highlights the consistency in identifying dermatoses, particularly psoriasis, as a leading cause of erythroderma across different geographic regions.

These findings align with Munyao et al. (2007), a previous Kenyan study that also identified male predominance (60% males in a 3:2 ratio, compared to 56% males in our study). Munyao et al. found that atopic dermatitis affected 83% of their participants, with HIV being the leading systemic disease in 20% of cases. The differences in findings, particularly the lower prevalence of HIV in our study, may be due to the retrospective nature of Munyao et al.'s analysis, which was conducted over 10 years. Over the years, changes in HIV prevalence and treatment advancements could have influenced the observed trends. Our study and Munyao et al.'s share similar sociodemographic patterns, but the temporal gap between studies may explain some of the variability, particularly in the frequency of systemic diseases such as HIV.

Our study found that 63% of patients underwent skin biopsies, with a higher rate in the prospective arm (88%) compared to the retrospective arm (57%). Skin biopsies were more frequently performed in new cases (prospective) than in past cases (retrospective). This is comparable to a study in Australia, which reported an 85% higher rate of subsequent biopsies in individuals who had undergone a skin screening examination prior to enrollment (Whiteman et al., 2022). The higher biopsy rate in our study and Whiteman et al.'s study can be attributed to the inclusion of individuals who underwent skin screening, making them more likely to undergo biopsy. In contrast, Sherban et al.'s purely retrospective study had lower biopsy rates, which could be due to the absence of screening and the different study design.

The current study found that cutaneous T-cell lymphoma was the leading skin biopsy finding, followed by psoriasis (25.49%) and immunobullous diseases (17.65%), with non-specific dermatoses accounting for 11.76%. This is comparable to Jackow et al. (1997), who identified 31 patients with Sezary syndrome and 11 with Mycosis Fungoides (MF), representing 76% of their findings (Jackow et al., 1997). Additionally, our results align with a study in Poland, who reviewed 212 hospitalized cases and found psoriasis as the leading etiology (24%), followed by atopic dermatitis (13.2%) and cutaneous T-cell lymphoma (13.2%), with 19.1% of cases remaining idiopathic (Kliniec et al., 2024). The similarity in findings reflects consistent referral patterns and the use of standardised histopathological protocols at high-volume tertiary centres. This suggests that both our study and those of Jackow et al. (1997) and Kliniec et al. (2024) benefited from similar methodologies and diagnostic frameworks, supporting the reliability of cutaneous T-cell lymphoma as a common diagnosis in these clinical settings.

In our study, the sensitivity of malignancies was 100%, while the lowest sensitivity was observed in immunobullous diseases (55.6%) and eczema (66.7%). Our sensitivity for psoriasis (76.9%) is notably lower than the >90% sensitivity reported in systematic evaluations of structured diagnostic criteria by a study in the UK (Burden-Teh et al., 2018). Similarly, for eczema, our sensitivity of 66.7% is slightly higher than the 62% recorded in patient-reported hand eczema assessments validated against dermatologist diagnosis in Sweden (Svensson et al., 2002). Notably, our study introduces correlation tests, like Cohen's Kappa, to assess inter-reliability, a method not previously utilised in other erythroderma studies. Eczematous dermatitis is often a nonspecific

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finding in biopsy reports, which may explain the relatively lower sensitivity for eczema. Furthermore, immunobullous diseases require immunofluorescence for a definitive diagnosis, which could contribute to the observed lower sensitivity for these conditions. The variations in sensitivity across different diseases highlight the challenges in diagnostic accuracy and the need for more robust diagnostic protocols in erythroderma cases.

Limitations of the study

Retrospective study design introduced reliance on existing medical records, which vary in completeness and accuracy. Missing data in this arm potentially introduces information bias. In addition, the study was conducted in a single referral hospital, which may not represent the Kenyan landscape analysis of EE.

CONCLUSION

Dermatoses are the leading cause of EE, accounting for over half of the cases, led by psoriasis, then eczema, and followed by systemic diseases, where malignancies lead. The higher biopsy rate in the prospective arm (88 %) VS the retrospective arm (57 %) underscores the importance of active case ascertainment in new presentations. CTCL was the most common biopsy-confirmed diagnosis (39.22 %), reflecting its increasing prevalence and late presentation in KNH, given its non-specific nature in some of the early biopsy reports. The diagnostic pathway demonstrated a high correlation between clinical and histopathological findings for immunobullous and malignancy. Thus, based on these findings, it is essential to adopt a biopsy-first protocol for all new presentations of EE to maximise diagnostic yield as well as establish a multidisciplinary review board of dermatologists, pathologists, and immunologists for complex erythroderma cases to harmonise clinicopathological correlation and optimise treatment decisions.

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Conflict of Interest

There was no known conflict of interest to declare

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