

# A case series of dermatological emergencies - Erythroderma

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## SUMMARY

Erythroderma can be life-threatening, primarily because of its metabolic burden and complications. It is mandatory to establish its etiopathology in order to facilitate precise and definitive management. This disorder may be the morphologic presentation of a variety of cutaneous and systemic diseases. Detailed history and thorough work-up is therefore essential. Management of erythroderma involves multi-disciplines with progress monitoring especially on signs and symptoms suggestive of acute skin failure induced complications. Early diagnosis and referral of erythroderma to centres with dermatological services is crucial and will directly affect the outcome of the patients.

## KEY WORDS:

*Erythroderma, Acute skin failure, Dermatological Emergencies*

## INTRODUCTION

Erythroderma is a dermatological emergency defined as erythema and scaling occurring in a generalised distribution involving more than 90% of the total body surface area. Widespread alterations of the skin functions could result in a number of complications which are known collectively as acute skin failure. This case series is a prospective review of three patients who presented to Emergency Department of Hospital Taiping. It underscores the importance of recognising erythroderma and early referral to health institutions equip with physicians experienced in treating such dermatological diseases.

## CASE REPORT

### CASE A: ERYTHRODERMIC PSORIASIS SECONDARY TO DISCONTINUATION OF MEDICATIONS

A 37-year-old male prisoner, known Hepatitis C carrier, plaque psoriasis and psoriatic arthritis mutilans, presented with generalised body rashes involve his entire body surface area within two weeks' durations after stopping his medications. There was generalised arthralgia with fever for four days. At presentations, he was pyretic with temperature of 37.4°C but was otherwise stable. There was generalised erythema and diffuse thick crusted plaques involving all body surface area. During admissions, patient was closely monitored and was treated with oral retinoid therapy, topical corticosteroid, topical emollients and completed one course of antibiotic. He was eventually discharged well at day 13 of admission.

### CASE B: DRUG INDUCED EXFOLIATIVE DERMATITIS

A 74-year-old gentleman with no pre-existing dermatosis, nor prior medical problems presented with generalised skin itchiness associated with diffuse skin erythema for one month associated with bilateral lower limb swelling of two weeks' duration. He had fever for two days prior to presentations. For the past one month, he had contacted local health clinics as well as Emergency Department however his condition was not settled with topical ointment, antihistamines and oral prednisolone. He was on oral antibiotics for his urinary tract infection prior to current presentation. He was afebrile but appeared dehydrated with tachycardia. Generalised erythema and scaly lesions were distributed throughout his entire body surface area. He was admitted for four days for medical stabilisation and was diagnosed to have drug induced exfoliative dermatitis based on the skin biopsy HPE results. Patient was arranged for further work-up on paraneoplastic syndrome with cutaneous manifestations.

### CASE C: ERYTHRODERMIC PSORIASIS SECONDARY TO NON-COMPLIANCE TO MEDICATIONS

A 30-year-old gentleman, with underlying plaque psoriasis, presented with bilateral knee pain for one week associated with rapid worsening of psoriatic plaques within three-week duration involving the whole-body surface area. He had on and off fever. He had poor compliance to medications. At presentations, he was haemodynamically stable with fever recorded as 37.8°C. He had generalised scaly plaques over entire body with underlying erythematous skin. Both knees were mildly swollen and tender on palpation. Range of movement of both knees was restricted due to pain. He was admitted was started on oral ciclosporin, topical steroids and topical emollients. He was discharged well at day four of admission.

## DISCUSSION

Erythroderma commonly present itself as generalised redness of the skin with or without skin peeling scales<sup>2</sup> as shown in the pictures above. As the largest organ in the human body, skin serves as a strong barrier to the entire body. Erythroderma alters skin functions and subsequently may lead to acute skin failure.<sup>1,2,5</sup>

There are many causes which contribute to erythroderma. It might represent the worsens of pre-existing skin condition. These may include a variety spectrum of underlying skin disorders including eczema, psoriasis, ichthyosis, pemphigus foliaceus, photodermatitis, etc.<sup>3,5</sup>

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**Table I: Summary of Investigations Results at Presentations**

	Case A	Case B	Case C
<b>Full Blood Count</b>			
Haemoglobin	6.8 g/dL	11.8 g/dL	12.8 g/dL
White cell count	28 x 10 <sup>9</sup> /L	14 x 10 <sup>9</sup> /L	9.5 x 10 <sup>9</sup> /L
Platelet	721 x 10 <sup>9</sup> /L	293 x 10 <sup>9</sup> /L	429 x 10 <sup>9</sup> /L
Eosinophils count	0.42 x 10 <sup>9</sup> /L	5.92 x 10 <sup>9</sup> /L	0.21 x 10 <sup>9</sup> /L
<b>Renal Profiles/Liver function test</b>			
Urea	6.1 mmol/L	7.5 mmol/L	2.1 mmol/L
Creatinine	106 µmol/L	129 µmol/L	65 µmol/L
Albumin	13.3 g/L	26.3 g/L	20.2 g/L
Aspartate transaminase	33 U/L	48 U/L	23 U/L
Alanine transaminase	16 U/L	49 U/L	22 U/L
<b>Infective Screening</b>			
Hepatitis B Surface Antigen	Non-reactive	Non-reactive	-
Anti-HIV 1 & 2 Antibody	Non-reactive	Non-reactive	-
Hepatitis C Antibody Screening	Reactive	Reactive	-
Hepatitis C Virus PA	-	Not detected	-
<b>Culture And Sensitivity Results</b>			
Blood	No growth	No growth	No growth
Urine	No growth	No growth	No growth
<b>Tumor markers</b>			
Carcinoembryonic Antigen	-	1.6 ng/ml	-
CA 19-9	-	< 2.00 U/ml	-
Alpha-feto Protein	-	2.50 IU/ml	-
Prostate Specific Antigen	-	0.729 ng/ml	-
<b>Full Blood Picture</b>			

**Case A**

:Normochromic normocytic red cells. Leukocytosis with neutrophilia and left shifted. No blasts are seen.

**Case B**

:No abnormal eosinophils/abnormal lymphoid cells/blasts are seen. Suggest to rule out secondary causes of eosinophilia

**Skin Biopsy**

**Case B**

Skin biopsy taken from right thigh medial aspect showed a skin tissue with subcutis displaying parakeratosis, irregular acanthosis and hyperkeratosis of the squamous epithelium. The upper dermis display perivascular largely plasma cells infiltration with a few lymphocytes and scattered eosinophils with evident red blood cells extravasation. No atypical lymphoid or epithelial cell seen. These features favor a drug related reaction and were negative for paraneoplastic skin disease.

\* - : test not carried out

Similar dermatological presentations may spell different diagnoses and hence lead to false decisions in patient management. Inappropriate treatment may cause more harm to patients. Other causes include Malignancy, e.g., Cutaneous Lymphoma, which requires a skin biopsy for confirmation. Some of the drug eruptions may sometimes present as erythroderma.<sup>1,3</sup>

Loss of function of the skin causes numerous challenges to the clinicians. Losing the integrity of this external barrier leads to dehydration and hence oliguric renal failure<sup>1,4</sup>. Electrolyte imbalance may pursue and complicate the severity of the illness. Protein loss in this situation gives rise to hypoalbuminemia which causes oedema.

The challenges remain difficult with the loss of temperature regulation. The fluctuation of temperature, regardless of hypothermia or hyperthermia, may cause dysfunction of the enzymes of the body.<sup>1</sup> The resulting peripheral vasodilatation leads to high-output cardiac failure.

Without the skin barrier, the immune system is compromised. The patients are therefore susceptible to systemic infection. It also causes instability of metabolic and endocrine function where the patients are prone to hypercatabolic state and associated with hyperglycaemia.

There is increased risk of mortality and morbidity especially in elderly and those with co-morbidities.

Immediate management in emergency department is crucial.<sup>4,5</sup> Managing erythroderma includes obtaining essential and targeted relevant history, and physical examination to look for complications. Preexisting skin disease, duration of disease, associated systemic symptoms, drug history, allergen exposure are all crucial questions to be answered. Syndrome of acute skin failure may present. haemodynamically instability secondary to dehydration, signs of sepsis, temperature dysregulation, extent of skin lesion, morphology of skin lesions, any lymphadenopathy and hepatosplenomegaly.

History and physical examination are supported by urgent investigation. Electrolyte imbalance and acute renal failure can be diagnosed through renal profile while liver function test may show hypoalbuminaemia. Septic workout is warranted if any signs of sepsis. Simple investigations like CXR and ECG can help to diagnose a rare complication of acute skin failure, namely high cardiac output failure.

While this category of patients commonly has patent airway and adequate breathing, the principles of immediate management include fluid resuscitation of compromised



Fig. 1: Patients' skin conditions at presentations (Anterior Trunks).



Fig. 2: Patients' skin conditions at presentations (Posteri) or Trunk.

\* All the above patients have consented for these photographs to be used in medical publications, including medical journals and electronic publications.

circulation. Control of sepsis requires adequate resuscitation and intravenous antibiotics. Augmentation by inotropes might be needed. Besides fluid resuscitation, temperature regulation is achieved through warmer or blanket.

The disposition of the patients is of crucial importance. They require prompt referral to health institutions equip with specialists capable of providing intensive dermatological care.<sup>1,4,5</sup> A delay in referral will adversely affect the outcome of the patient as well as exposing patients to more drugs which can increase the challenge in the diagnosis of the underlying causes.

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