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Profile of patients with epidermal necrolysis at Dr. Soetomo General Hospital, Surabaya Period 2021-2023

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Abstract

Epidermal necrolysis, encompassing Stevens-Johnson Syndrome (SJS), SJS-TEN overlap, and Toxic Epidermal Necrolysis (TEN), is a life-threatening hypersensitivity reaction characterized by extensive epidermal and mucosal damage, often induced by specific medications. This study aimed to describe the prevalence, demographic distribution, causative factors, clinical manifestations, SCORTEN scores, comorbidities, management approaches, consultations, and outcomes of epidermal necrolysis patients treated at Dr. Soetomo General Hospital, Surabaya, during 2021–2023. A descriptive retrospective method was employed using medical record data. A total of 28 cases were identified, with SJS as the most common type (57%). The majority of patients were aged 36–45 years (21%), female (53.5%), residents of Surabaya (68%), and employed in the private sector (32%). Paracetamol was the most frequent trigger (16%). Skin lesions, particularly macules, were the predominant clinical manifestation (48%), with SCORTEN scores mainly ranging between 0–1 (43%). Sepsis was the most common comorbidity (8.5%), and the primary treatment involved discontinuation of the offending drug (24%). The Department of Internal Medicine was the most frequently consulted (51%), and 57% of patients recovered. In conclusion, most epidermal necrolysis cases were classified as SJS, predominantly affecting middle-aged females, with paracetamol as the leading causative drug. Early identification and prompt withdrawal of the causative medication remain crucial for favorable outcomes.

Keywords: Epidermal necrolysis; SSJ; TEN; SCORTEN; Drug reaction; Epidermolysis

1. Introduction

Epidermal necrolysis is an acute mucocutaneous hypersensitivity reaction characterized by extensive epidermal necrosis and detachment, leading to severe complications and potentially fatal outcomes [1]. The condition encompasses a clinical spectrum ranging from Stevens-Johnson Syndrome (SJS) to Toxic Epidermal Necrolysis (TEN), which differ mainly by the percentage of body surface area involved [2]. Although rare, SJS/TEN carries significant clinical importance due to its high morbidity and mortality rates. Globally, the incidence varies from 1 to 2 cases per million annually, with a higher prevalence among females aged 40–60 years [3, 4]. Drug exposure is the most common trigger, accounting for approximately 77–95% of all SJS/TEN cases, particularly involving medications such as allopurinol, carbamazepine, phenytoin, lamotrigine, and certain antibiotics and NSAIDs [5–7].

In Indonesia, epidemiological data on epidermal necrolysis remain limited. Previous studies from Dr. Soetomo General Hospital, Surabaya, revealed that most patients were female, aged 25–44 years, with drug-induced reactions—mainly analgesics—being the leading cause [8]. Given its rarity yet severe clinical impact, a comprehensive understanding of local case profiles is crucial to guide early diagnosis, management, and prevention strategies. Therefore, this study aims

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to describe the demographic, clinical, and therapeutic characteristics of epidermal necrolysis cases at Dr. Soetomo General Hospital, Surabaya, during the 2021–2023 period, thereby contributing to national data on this life-threatening dermatological emergency and supporting better pharmacovigilance efforts in Indonesia.

2. Material and methods

The research method applied was a descriptive retrospective study using electronic medical record data of epidermal necrolysis patients at Dr. Soetomo General Hospital, Surabaya in 2021-2023. Data were collected using a total sampling technique from the entire population of epidermal necrolysis patients. Furthermore, each data was evaluated one by one to assess the completeness of information according to the variables defined in the study. The information collected included patient identity, which consisted of age, gender, domicile, and occupation. In addition, data on epidermal necrolysis disease history was also extracted, including causative factors, clinical manifestations, SCORTEN scores, comorbidities, management, consultations needed, and cure and mortality rates.

3. Results and discussion

3.1. Prevalence

Table 1 Distribution of new cases of epidermal necrolysis

Year	Number of new case	Percentage (%)
2021	6	21.43%
2022	8	28.57%
2023	14	50.00%
Total	28	100.00%

Source: Research data, processed

During 2021–2023, a total of 28 eligible epidermal necrolysis cases were identified at Dr. Soetomo General Hospital. The number of cases increased each year, from 6 (21.43%) in 2021 to 14 (50.00%) in 2023. This upward trend might be linked to indirect impacts of the COVID-19 pandemic, such as reduced healthcare access, self-medication, and immune activation post-infection or vaccination [9–11].

Table 2 Distribution of epidermal necrolysis patient classifications

Classification	Number of new case	Percentage (%)
Stevens-Johnson Syndrome (SJS)	16	57.14%
SJS/TEN overlap	3	10.71%
Toxic Epidermal Necrolysis (TEN)	9	32.14%
Total	28	100.00%

Source: Research data, processed

Clinically, 57.14% were Stevens–Johnson Syndrome (SJS), 32.14% Toxic Epidermal Necrolysis (TEN), and 10.71% SJS–TEN overlap. The dominance of SJS aligns with global data showing that SJS is more frequent due to its milder presentation, whereas TEN predominates in tertiary centers receiving severe cases [1,7].

3.2. Demographic Characteristics

Table 3 Age distribution of patients with epidermal necrolysis

Age	Classification			Frequency (n)	Percentage (%)
	SJS	SJS/TEN overlap	TEN		
0-5 years old	0	0	0	0	0.00%
5-11 years old	1	0	1	2	7.14%
12-16 years old	1	1	0	2	7.14%
17-25 years old	1	0	0	1	3.57%
26-35 years old	5	0	0	5	17.86%
36-45 years old	3	1	2	6	21.43%
46-55 years old	3	0	2	5	17.86%
56-65 years old	1	0	1	2	7.14%
>65 years old	1	1	3	5	17.86%
Total	16	3	9	28	100.00%

Source: Research data, processed

Most patients were aged 36–45 years (21.43%), followed by 26–35 years, 46–55 years, and >65 years (each 17.86%). This finding supports reports that epidermal necrolysis is more common among adults aged 20–59 years [3–5], likely due to higher drug exposure and comorbidities. No cases were recorded in children under five, consistent with the lower medication exposure in that group [12].

Table 4 Gender distribution of patients with epidermal necrolysis

Classification	Gender		Frequency (n)
	Male	Female	
Stevens-Johnson Syndrome (SJS)	6	10	16
SJS/TEN overlap	2	1	3
Toxic Epidermal Necrolysis (TEN)	5	4	9
Total	13	15	28
Percentage (%)	46.43%	53.57%	100.00%

Source: Research data, processed

Females accounted for 53.57% of cases, consistent with prior studies showing slightly higher risk among women due to hormonal and immunologic factors [2,7].

Table 5 Residence distribution of patients with epidermal necrolysis

Classification	Residence	
	Surabaya	Outside Surabaya
Stevens-Johnson Syndrome (SJS)	12	4
SJS/TEN overlap	2	1
Toxic Epidermal Necrolysis (TEN)	5	4
Total	19	9
Percentage (%)	67.86%	32.14%

Source: Research data, processed

Table 6 Occupational distribution of patients with epidermal necrolysis

Occupation	SJS	SJS/TEN overlap	TEN	Frequency (n)	Percentage (%)
Private employee	7	0	2	9	32.14%
Housewife	4	1	2	7	25.00%
Student	2	0	1	3	10.71%
Entrepreneur	1	0	2	3	10.71%
Farmer	1	0	1	2	7.14%
Day laborer	0	1	0	1	3.57%
Unidentified	1	1	1	3	10.71%

Source: Research data, processed

Most patients lived in Surabaya (67.86%), while 32.14% were referrals from outside regions, reflecting the hospital's role as a tertiary referral center [8]. Regarding occupation, private employees (32.14%) and housewives (25.00%) dominated, consistent with other reports associating epidermal necrolysis with the productive age group [13].

3.3. Etiology

Table 7 Drug consumption history distribution of patients with epidermal necrolysis

Drug consumption history	SJS	SJS/TEN overlap	TEN	Frequency (n)	Percentage (%)
Paracetamol	4	2	3	9	32.14%
Ciprofloxacin	1	0	3	4	14.29%
Amoxicillin	2	0	1	3	10.71%
Ceftriaxone	2	0	1	3	10.71%
Metamizole	1	0	2	3	10.71%
Herbal medicine	1	1	0	2	7.14%
Valproic acid	2	0	0	2	7.14%
Mefenamic acid	1	1	0	2	7.14%
Carbamazepine	1	0	1	2	7.14%
Dexamethasone	1	0	1	2	7.14%
Allopurinol	2	0	0	2	7.14%
Erythromycin	1	0	0	1	3.57%
Dapsone	1	0	0	1	3.57%
Phenytoin	1	0	0	1	3.57%
Metoclopramide	1	0	0	1	3.57%
Cefadroxil	1	0	0	1	3.57%
Halmezin Syrup	1	0	0	1	3.57%
Farmalat	1	0	0	1	3.57%
Paratusin	1	0	0	1	3.57%
Fenofibrate	1	0	0	1	3.57%
Cefixime	0	1	0	1	3.57%

Sinovac Vaccine	0	0	1	1	3.57%
Ketoconazole	0	0	1	1	3.57%
Moxifloxacin	0	0	1	1	3.57%
Sulfamethoxazole	0	0	1	1	3.57%
Sodium Diclofenac	0	0	1	1	3.57%
Unidentified	2	1	2	5	17.86%
Total	29	6	19	54	100.00%

Note: One patient may take more than one type of medication. Source: Research data, processed

Drugs were the leading cause of epidermal necrolysis, with paracetamol (32.14%) as the most frequent suspected agent, followed by ciprofloxacin (14.29%), amoxicillin, ceftriaxone, and metamizole (each 10.71%). These findings are consistent with local studies at Dr. Soetomo General Hospital reporting paracetamol as the leading trigger [8,14], although globally, allopurinol and antiepileptics such as carbamazepine remain the predominant agents [1,4,6,15].

Five cases (17.86%) had unidentified causes, and a few were linked to herbal remedies (7.14%) and post–COVID-19 vaccination (3.57%), though vaccine-related SJS/TEN is extremely rare (<1 per million doses) [11,16].

Table 8 Infection history distribution of patients with epidermal necrolysis

Infection history	SJS	SJS/TEN overlap	TEN	Frequency (n)	Percentage (%)
HIV	2	0	0	2	7,14%
Total	2	0	0	2	7,14%

Source: Research data, processed

Two patients (7.14%) were HIV-positive, supporting literature showing a markedly increased epidermal necrolysis risk in HIV infection due to immune dysregulation and polypharmacy [17,18].

3.4. Clinical Manifestations

Table 9 Clinical manifestations distribution of patients with epidermal necrolysis

Classification	Clinical manifestations			Frequency (n)
	Skin	Mucosa	Extracutaneous	
Stevens-Johnson Syndrome (SJS)	15	13	3	31
SJS/TEN overlap	3	3	1	7
Toxic Epidermal Necrolysis (TEN)	9	6	3	18
Total	27	22	7	56
Percentage (%)	96.43%	78.57%	25.00%	100.00%

Note: one patient may have more than one clinical manifestation. Source: Research data, processed

Table 10 Skin manifestations distribution of patients with epidermal necrolysis

Skin manifestations	SJS	SJS/TEN overlap	TEN	Frequency (n)	Percentage (%)
Macule	13	2	8	23	82.14%
Erosion	6	2	5	13	46.43%
Bulla	5	2	3	10	35.71%
Squama	5	0	3	8	28.57%
Crust	3	1	3	7	25.00%

Plaque	2	1	0	3	10.71%
Papule	0	0	2	2	7.14%
Pustule	0	1	1	2	7.14%
Vesicle	0	0	1	1	3.57%
Nodule	0	0	0	0	0.00%
Ulcer	0	0	0	0	0.00%
Itching	1	1	1	3	10.71%
Total	35	10	27	72	100.00%

Note: one patient may have more than one skin manifestation. Source: Research data, processed

Cutaneous involvement was observed in 96.43% of cases—mainly macules (82.14%), erosions (46.43%), and bullae (35.71%)—consistent with the classical clinical course of epidermal necrolysis progressing from erythematous macules to flaccid bullae and epidermal detachment [1,2,19].

Table 11 Mucosal manifestations distribution of patients with epidermal necrolysis

Mucosal manifestations	SJS	SJS/TEN overlap	TEN	Frequency (n)	Percentage (%)
Erosion	6	1	4	11	39.29%
Crust	7	2	2	11	39.29%
Macule	5	1	1	7	25.00%
Plaque	2	0	1	3	10.71%
Pustule	1	0	1	2	7.14%
Ulcer	0	1	1	2	7.14%
Painful swallowing	3	1	2	6	21.43%
Red eyes	2	1	2	5	17.86%
Edema	1	0	1	2	7.14%
Ear pain	1	0	0	1	3.57%
Total	28	7	15	50	100.00%

Note: one patient may have more than one mucosal manifestation. Source: Research data, processed

Table 12 Extracutaneous manifestations distribution of patients with epidermal necrolysis

Extracutaneous manifestations	SJS	SJS/TEN overlap	TEN	Frequency (n)	Percentage (%)
Fever	3	1	1	5	17.86%
Pain	0	0	1	1	3.57%
Edema in the extremities	0	0	1	1	3.57%
Total	3	1	3	7	100.00%

Note: one patient may have more than one extracutaneous manifestation. Source: Research data, processed

Mucosal involvement occurred in 78.57% of patients, especially erosions and crusting (each 39.29%), while extracutaneous features such as fever and limb edema were noted in 25%. This reflects extensive epithelial apoptosis and systemic inflammation typical of EN [3,20].

3.5. SCORTEN

Table 13 SCORTEN distribution of patients with epidermal necrolysis

SCORTEN	SJS	SJS/TEN overlap	TEN	Frequency (n)	Percentage (%)
SCORTEN 0-1	11	0	1	12	42.86%
SCORTEN 2	3	1	3	7	25.00%
SCORTEN 3	2	1	1	4	14.29%
SCORTEN 4	0	1	4	5	17.86%
≥ SCORTEN 5	0	0	0	0	0.00%
Total	16	3	9	28	100.00%

Source: Research data, processed

Most patients had SCORTEN 0–1 (42.86%), suggesting mild disease, while 17.86% scored 4, predicting >50% mortality. Common factors included age >40 years (57.14%), BSA >10% (53.57%), and tachycardia >120 bpm (35.71%).

3.6. Comorbidities

Table 14 Comorbidities distribution of patients with epidermal necrolysis

Comorbidities	SJS	SJS/TEN overlap	TEN	Frequency (n)	Percentage (%)
Sepsis	3	1	5	9	32.14%
Anemia	5	0	2	7	25.00%
Hypoosmolar hyponatremia	2	0	3	5	17,86%
Hypoalbuminemia	3	0	2	5	17,86%
Hypertension	3	0	2	5	17,86%
Pneumonia	3	2	0	5	17,86%
Bilirubin metabolism disorder	3	0	2	5	17,86%
Blepharoconjunctivitis	2	1	1	4	14.29%
Hyponatremia	2	0	1	3	10.71%
Type 2 diabetes mellitus	1	0	2	3	10.71%
Acute renal failure	2	0	1	3	10.71%
Malnutrition	0	2	1	3	10.71%
Epilepsy	2	0	1	3	10.71%
Renal failure	2	0	1	3	10.71%
HIV	2	0	0	2	7.14%
Hyperkalemia	2	0	0	2	7.14%
Candidiasis	2	0	0	2	7.14%
Candidal stomatitis	1	1	0	2	7.14%
Type 1 respiratory failure	1	0	1	2	7.14%
Hypernatremia	1	0	1	2	7.14%
SLE	2	0	0	2	7.14%

Note: One patient may have more than one comorbidity. Source: Research data, processed

Sepsis (32.14%), anemia (25%), and electrolyte disorders (17.86%) were leading comorbidities. Sepsis correlated with higher SCORTEN and mortality, confirming its role as a major prognostic determinant [5,21].

3.7. Treatments

Table 15 Treatments distribution of patients with epidermal necrolysis

Treatments	SJS	SJS/TEN overlap	TEN	Frequency (n)	Percentage (%)
Discontinuation of medication	16	3	9	28	100.00%
Injections	13	3	7	23	82.14%
Wound care	11	3	7	21	75.00%
Infusions	8	1	6	15	53.57%
Oral medication	5	1	2	8	28.57%
Fluid balance	6	0	0	6	21.43%
Monitoring vital signs	3	1	1	5	17.86%
Maintaining hygiene	2	1	0	3	10.71%
Oxygenation	1	0	2	3	10.71%
NGT	1	0	2	3	10.71%
Occupational therapy	1	0	0	1	3.57%
Change position every 2 hours	1	0	0	1	3.57%
Total	68	13	36	117	100.00%

Note: one patient may receive more than one treatment. Source: Research data, processed

All patients underwent discontinuation of the suspected drug (100%), along with systemic corticosteroids or antibiotics (82.14%), wound care (75%), IV fluids (53.57%), and oral antihistamines (28.57%). These interventions follow standard epidermal necrolysis management emphasizing causative drug withdrawal and supportive therapy [6,19].

3.8. Consultations

Table 16 Consultations distribution of patients with epidermal necrolysis

Consultations	SJS	SJS/TEN overlap	TEN	Frequency (n)	Percentage (%)
Internal Medicine	13	3	7	23	82.14%
Ophthalmology	4	0	4	8	28.57%
ENT	3	0	2	5	17.86%
Dermatology and Venereology	2	0	2	4	14.29%
Cardiology	0	0	2	2	7.14%
Pediatrics	1	0	0	1	3.57%
Neurology	1	0	0	1	3.57%
Psychiatry	0	0	1	1	3.57%
Total	24	3	18	45	100.00%

Note: One patient may consult with more than one department. Source: Research data, processed

Consultations were mainly with internal medicine (82.14%), ophthalmology (28.57%), and ENT (17.86%).

3.9. Outcomes

Table 17 Outcomes distribution of patients with epidermal necrolysis

Classification	Outcomes				Frequency (n)
	Improved	Deceased	Forcibly discharged	Referred	
SJS	10	4	1	1	16
SJS/TEN overlap	1	1	1	0	3
TEN	5	4	0	0	9
Total	16	9	2	1	28
Percentage (%)	57.14%	32.14%	7.14%	3.57%	100.00%

Source: Research data, processed

Recovery was achieved in 57.14% of cases, while mortality reached 32.14%, mostly among TEN patients with high SCORTEN scores.

4. Conclusion

This study identified 28 cases of epidermal necrolysis at Dr. Soetomo General Hospital, Surabaya, between 2021 and 2023, with Stevens-Johnson Syndrome (SJS) being the most common subtype. The condition predominantly affected individuals aged 36–45 years, with a higher incidence in females, residents of Surabaya, and private-sector workers. Paracetamol was the most frequently associated causative drug, and the primary clinical manifestation was macular skin lesions. Most patients presented with low SCORTEN scores (0–1) and sepsis as the leading comorbidity. Drug withdrawal was the most frequently applied management approach, and the Department of Internal Medicine was the most consulted specialty. The overall recovery rate reached 57%, while mortality was recorded at 32%. These findings emphasize the importance of early recognition and prompt cessation of the causative drug to improve survival outcomes. This study contributes to enhancing clinical awareness and supports preventive efforts through better drug monitoring and patient education, ultimately benefiting public health and guiding future research on drug-induced epidermal necrolysis.

Compliance with ethical standards

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Disclosure of conflict of interest

The authors declared there is no conflict of interest.

Statement of ethical approval

The study was approved by the Ethics Committee of Dr. Soetomo Regional General Hospital.

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