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(CASE REPORT)

Paracetamol-induced Lyell syndrome in a 3-year-old child: A case report and review of the literature

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Abstract

Lyell's syndrome (LS), also known as toxic epidermal necrolysis (TEN), is a rare but severe drug-induced mucocutaneous eruption that can be fatal. Although it is a well-known condition in adults, its incidence in children is considerably lower. Among the drugs associated with LS, paracetamol (acetaminophen) is infrequently implicated. We present the case of a 3-year-old male who developed LS following paracetamol administration. This case highlights the importance of early recognition, prompt treatment, and the need for heightened awareness regarding the potential for severe adverse reactions to commonly used medications in pediatric populations.

Keywords: Lyell's syndrome; Toxic epidermal necrolysis; Paracetamol; Pediatric dermatology; Drug-induced hypersensitivity

1. Introduction

Lyell's syndrome (LS), or toxic epidermal necrolysis, is a life-threatening dermatologic condition characterized by widespread skin detachment, mucosal involvement, and systemic toxicity. LS is most often drug-induced, and while it is rare in the general population, it is associated with a high mortality rate. The condition is particularly uncommon in pediatric patients, with the incidence even lower when caused by paracetamol, a drug commonly prescribed and widely regarded as safe, particularly in children [1, 2]. Here, we describe a case of paracetamol-induced Lyell's syndrome in a young child and review the current literature regarding this rare adverse event.

2. Case Presentation

A 3-year-old male child was referred to the pediatric emergency department with a rash that had developed 1 week after receiving paracetamol for a suspected viral flu syndrome. The child had no significant medical history prior to the event. On admission, the patient appeared asthenic and was in moderate distress. Physical examination revealed erythematous macules that had merged into large generalized areas, covering approximately 80% of the total body surface area (BSA) with skin detachment in over 60% of the BSA. The Nikolsky sign was positive, and the skin had a "wet laundry" appearance, indicating active epidermal separation **(Figure 1)**. The child also exhibited cheilitis, conjunctival hyperemia, palpebral synechiae (adhesion of the eyelid to the cornea), and bilateral cervical lymphadenopathy.

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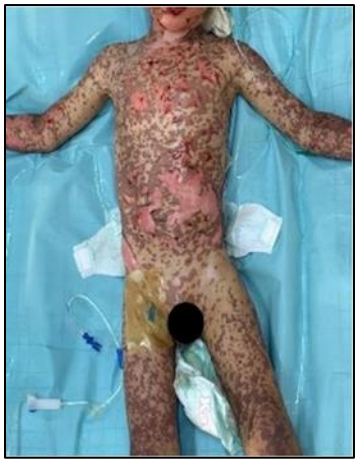

Figure 1 Erythematous macules confluent in generalized sheets with extensive epidermal detachment

Despite the severity of the dermatologic findings, the initial laboratory work-up did not reveal any significant abnormalities. Skin biopsy could not be performed due to the patient's general condition. A comprehensive pharmacological review suggested paracetamol as the probable causative agent. The diagnosis of Lyell's syndrome was confirmed based on clinical presentation and pharmacological imputability.

The child was promptly started on supportive care, including daily local dressings and double antihistamine therapy to mitigate the inflammatory response. The patient also received ophthalmologic care, including the placement of lens dressings to prevent further ocular damage. Continuous monitoring of vital signs was performed, and close attention was given to fluid and electrolyte balance to prevent complications. Over the course of hospitalization, the patient's condition improved, with complete resolution of the skin lesions and only residual dyschromic skin scars at discharge **(Figure 2)**. The child was given a medical alert card, warning that the re-administration of paracetamol was strictly prohibited.

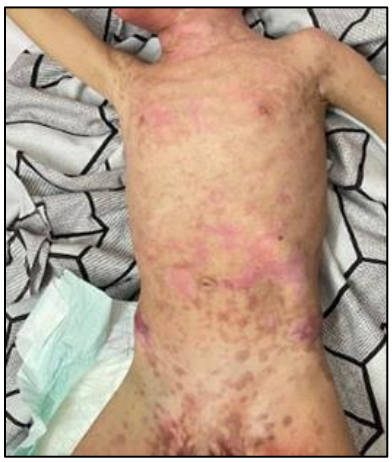

Figure 2 Cutaneous recovery with total re-epithelialization associated with dyschromic scars

3. Discussion

Lyell's syndrome is a rare, but potentially fatal, drug-induced dermatologic emergency characterized by widespread skin detachment, mucosal involvement, and systemic toxicity. The condition typically arises within 1-3 weeks following drug exposure, with early symptoms often including fever and mucosal involvement before the appearance of widespread erythema and blisters. The hallmark of LS is skin detachment exceeding 30% of the total body surface area, which can lead to significant morbidity, including fluid and electrolyte imbalances, sepsis, and multi-organ failure [3, 4]. In our case, the child presented with extensive skin detachment over 60% of the body surface, highlighting the severity of the condition.

Although Lyell's syndrome is primarily seen in adults, it can occur in children, particularly in association with drugs such as antibiotics and non-steroidal anti-inflammatory drugs. Paracetamol, a commonly used antipyretic and analgesic, is infrequently associated with LS, but it has been implicated in several case reports [5, 6]. The U.S. Food and Drug Administration (FDA) has issued a warning about the potential for severe hypersensitivity reactions, including Lyell's syndrome, associated with paracetamol use [7]. This case serves as a reminder that even drugs deemed safe, like paracetamol, can lead to rare but severe adverse reactions in vulnerable individuals.

The pathophysiology of LS remains not fully understood, but it is believed to involve immune-mediated cytotoxicity leading to massive keratinocyte apoptosis and skin detachment [8]. In the case of paracetamol, the mechanism of action may involve the production of toxic metabolites, particularly in individuals with genetic predispositions or impaired detoxification pathways [9]. The patient's response to paracetamol in this case aligns with these theories, as the clinical progression of the condition suggested an immune-mediated reaction.

Therapeutic management of LS centers on the immediate cessation of the causative drug and supportive care. The latter includes fluid resuscitation, wound care, and systemic therapies aimed at controlling the inflammatory response, such as antihistamines and corticosteroids. In severe cases, interventions like plasmapheresis or intravenous immunoglobulin (IVIG) may be considered [10]. Early ophthalmologic care is crucial for preventing long-term ocular complications, especially in cases with conjunctival involvement [11]. In our case, the child received appropriate wound care, antihistamines, and ophthalmologic care, which were pivotal in mitigating further complications. The child's positive response to these treatments emphasizes the importance of timely and comprehensive supportive care in improving outcomes for patients with LS.

Despite aggressive management, mortality rates can remain high, particularly in cases involving more than 50% skin detachment or associated with organ failure [12]. In this case, the child had a favorable outcome, with resolution of the acute symptoms and only residual skin scarring. However, the long-term implications of such severe dermatologic events, including the potential chronic pain and psychological trauma should not be underestimated [13].

4. Conclusion

Lyell's syndrome is a rare but severe drug-induced condition with high morbidity and mortality, particularly with extensive skin detachment. Despite paracetamol's common use, this case highlights its potential to cause severe hypersensitivity reactions. Early recognition, drug cessation, and prompt supportive care are crucial for better outcomes. Furthermore, clinicians must remain vigilant regarding the safety profile of commonly used like paracetamol.

Compliance with ethical standards

Acknowledgments

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Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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