CASE REPORT

Eastern Journal of Medicine

East J Med 27(4): 664-667, 2022
DOI: 10.5505/ejm.2022.46353

Is This Scarlet? Bacterial versus Viral Exanthem in Limited Resource Setting

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ABSTRACT

We report a case of a generalized bacterial-induced skin desquamation mimicking viral exanthem in a ten year old boy, providing insight for primary physicians on identifying tricky diagnostic cues in a type C general hospital with no attending dermatologist.

The patient presented with a chief complaint of high fever with generalized desquamation. Initial skin lesion was generalized erythematous skin rash, which evolved into vesicles and pustules, followed by a generalized desquamation. An initial diagnosis of bacterial infection was established. The patient was discharged after 8 days, with no fever but ongoing skin desquamation accompanied by mild sting and itch. Ten days after discharge, previously uninvolved areas of palms, soles, and intergluteal cleft started to exfoliate. Limited by the unavailability of specific supporting examinations, we eliminated differential diagnoses by relying on careful history taking and clinical symptoms, and pinpointed a more precise diagnosis of scarlet fever.

Keywords: Exanthem, scarlet fever, limited resource

Introduction

Exanthems are skin rash that occurs abruptly and simultaneously all over the body, occasionally accompanied by mucous membrane eruption and fever. Infection causes 65% of childhood exanthems; of which, 72% are viral (1).

Childhood exanthems are exceedingly common. However, diagnosis is not always straightforward due to the nonspecific appearance of the rashes. It is crucial to differentiate between harmless viral exanthems with more life-threatening conditions, particularly in settings with limited resources, where primary physicians often can only rely on clinical symptoms to promptly devise a treatment plan.

We report a case of a generalized bacterial-induced skin desquamation mimicking viral exanthem in a ten year old boy, providing insight for primary physicians on identifying tricky diagnostic cues in a type C general hospital with no attending dermatologist.

Case Report

A ten year old boy was admitted with a chief complaint of high fever since six days prior with generalized desquamation. Accompanying symptoms are nausea, vomiting, diarrhea, sore throat, myalgia, shortness of breath and cough.

On the first day of fever, the patient developed generalized erythematous skin rash, which on the second day evolved into generalized vesicles and pustules involving the neck, upper extremities, chest, abdomen, back, and proximal lower extremities (Figure 1), followed by a generalized desquamation on the fourth day (Figure 2). He took paracetamol, cetirizine, and antibiotics prescribed by a general practitioner but no improvement was found. Two days later he was admitted to a hospital with a working diagnosis of sepsis due to bacterial infection.

The patient was moderately ill and conscious. Throat examination revealed strawberry tongue appearance (Figure 3). No lymph node enlargement, dyspnea, respiratory muscle retraction, or additional lung sounds were found. Oxygen saturation was 99% on room air. Scoring using CENTOR score was performed with a total score of 2. Initial laboratory results demonstrated mild anemia (Hb 10.4 g/dL), elevated leukocyte count (29.400/mm^3), slightly high neutrophil count (71%), and low lymphocyte count (17%). Chest radiography showed prominent bronchovascular marking and infiltrates at both lung fields consistent with nonspecific process,

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Received: 0000-0001-6061-5451, **Accepted:** 0000-0001-6675-3310

Fig. 1. Generalized vesiculopapulopustular rash on the second day of fever.

while SARS-COV 2 antigen-detecting rapid test result was negative.

During hospitalization, a working diagnosis of bacterial infection was established. The patient received ringer lactate, paracetamol, ceftriaxone, intravenous dexamethasone, cetirizine, and topical triamcinolone acetonide. Intravenous dexamethasone was later switched to oral methylprednisolone, and ceftriaxone to oral cefixime upon discharge.

The patient was discharged after 8 days, with no fever but ongoing skin desquamation accompanied by mild sting and itch. Final diagnosis upon discharge was bacterial infection with allergic drug eruption. Ten days after discharge, previously uninvolved areas of palms, soles, and intergluteal cleft started to exfoliate. The patient's general condition had improved with only mild stinging from the remaining desquamation.

Discussion

The patient was discharged with a diagnosis of bacterial infection with allergic drug eruption, but taking into consideration the symptoms and the course of disease, a diagnosis of scarlet fever would be more sensible. We excluded allergic drug reaction as the patient had not consumed any drugs up to two weeks prior to the initiation of symptoms.

Scarlet fever, caused by group a streptococcal (GAS) bacteria, manifests as exudative pharyngitis with a spreading maculopapular rash (2). Characteristic features of scarlet fever are high fever over 38.5^{o}C with tachycardia, (3) erythematous sore throat, strawberry tongue, and sandpaper-like rash spreading from groin to the trunk and later to the extremities, before eventual desquamation. Upon admission, our patient had high fever, generalized desquamation, and sore throat. Physical examination demonstrated tachycardia and strawberry tongue appearance. Maculopapulopustular rash spread from the trunk to the extremities, slightly different with the typical presentation of skin rash in scarlet fever. However, it is possible that when the rash started spreading from the groin, the patient had not noticed.

Pastia lines, reddish lines made by confluent petechiae, are sometimes visible in intertriginous folds, and anterior cervical lymph node enlargement, which are often seen in scarlet fever, were not found in our patient. Usually no upper respiratory inflammation is found, and the desquamation typically occurs in the palms and soles, but not in the trunk. The pattern of desquamation was unique as typically in scarlet fever desquamation was only prominent in the palms and soles. Our patient demonstrated evident trunk desquamation, followed by desquamation in palms, soles, and intergluteal folds ten days after discharge. The occurence of late desquamation was also noted by Kerley (4) in a fourteen year old boy, who contracted an indefinite rash diagnosed as urticaria, which disappeared two days after. The desquamation did not occur until three weeks later, involving palms and soles. This author also observed a case of a five year old girl who underwent second desquamation two weeks after the first desquamation cleared five weeks after occurrence of symptoms. Kerley elaborated that at the time there was no means to prove the diagnosis bacterially, and that scarlet fever is often unrecognized when it manifested in atypical rash. (4). Diagnosis of scarlet fever is usually clinical with the aid of the CENTOR score, and it is prudent to consider GAS infection of the CENTOR score is 3 or more.

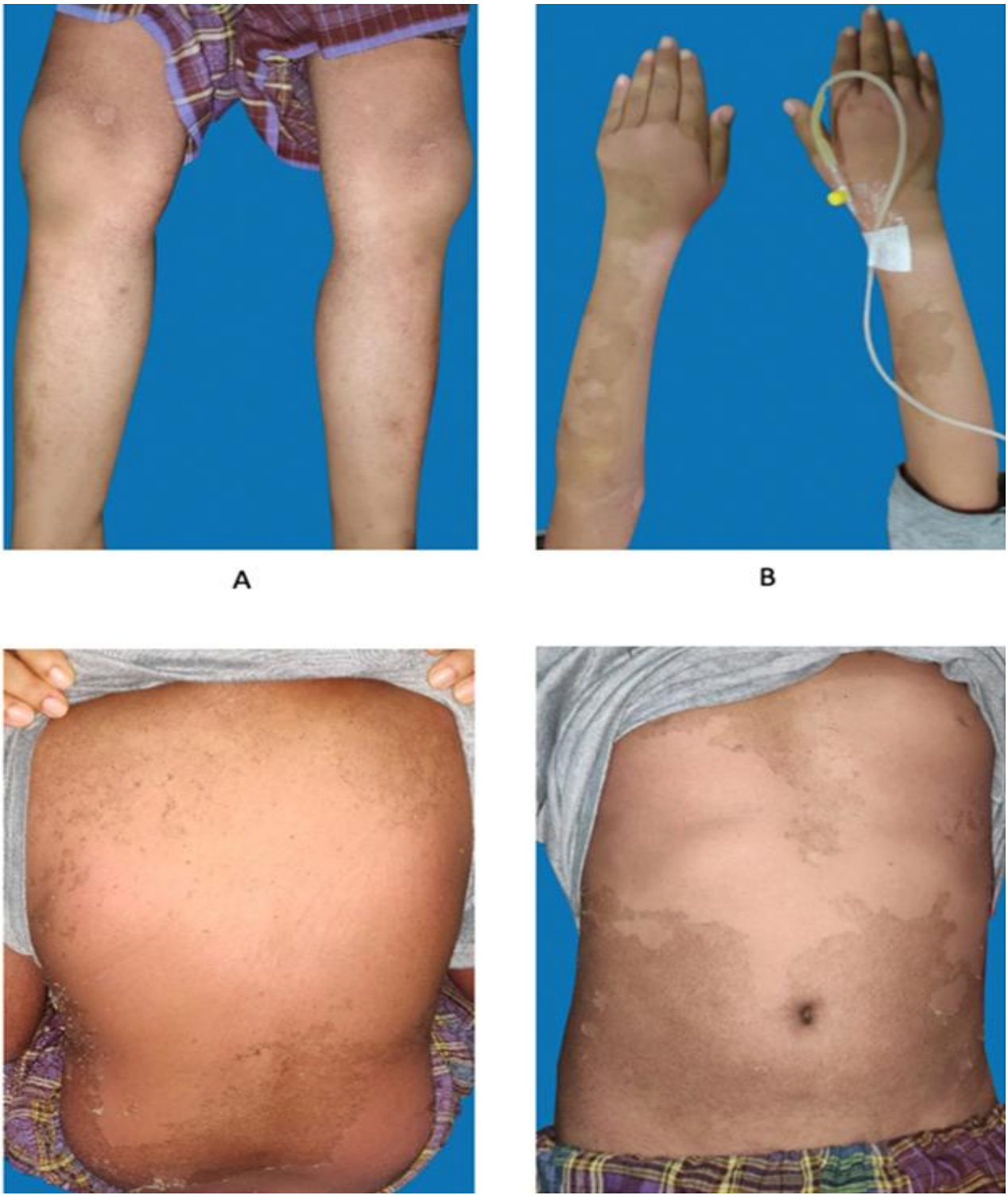

Fig. 2. Generalized desquamation affecting upper extremities (A), lower extremitis (B), and trunk (C and D).

This patient had a CENTOR score of 2. In doubtful cases, tonsillar swabs can be performed (2). Unfortunately, ASTO test and tonsillar swab were not done due to limited facility.

Differential diagnoses such as viral exanthem, Kawasaki disease, Sweet syndrome and guttate psoriasis could be excluded. Classical viral exanthem usually exhibits characteristic features, which are notably different from our patient. This patient also has an elevated leukocyte count (29,400/mm3) and a slightly raised neutrophil count (71%), which suggests a bacterial rather than viral infection. Measles and rubella demonstrate dissimilar clinical presentation and the pattern of spread is centrifugal. Exanthema subitum generally occurs in children younger than three years old, and the rash appears after the

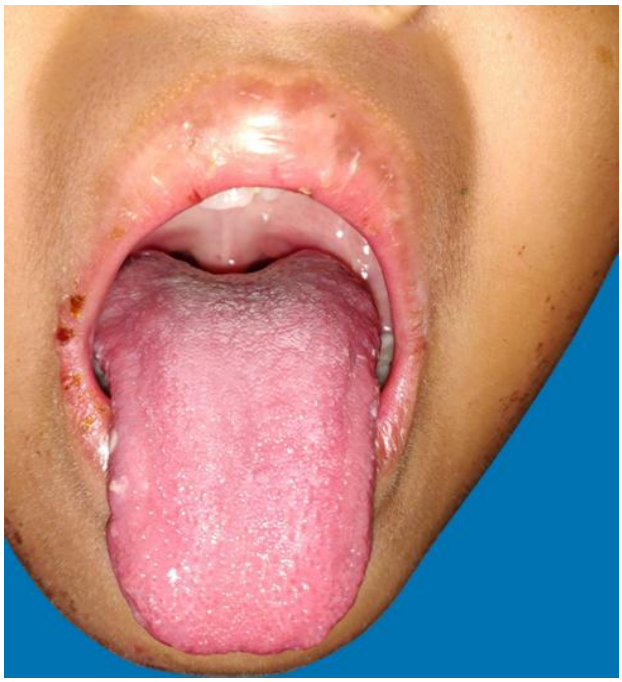

Fig. 3. Strawberry tongue appearance taken during admission in the hospital.

fever subsides. The "slapped cheek" and reticular skin exanthem, pathognomonic of exanthema infectiosum, was not found (5,6). Our patient exhibited several features remarkably similar with Kawasaki disease (7). However, the desquamation was flaky instead of sheet-like, and there was significant improvement in symptoms after administration of antibiotics and antipyretics. Sweet syndrome, characterized by macular rash, fever, and neutrophilia, (8) is mostly found in middle-aged women, and the exanthem is particularly painful – our patient reported only mild stinging during the desquamation. Drug- and malignancy-associated Sweet syndrome was unlikely because no history of malignancy of past use of culprit drugs was noted. Lastly, guttate psoriasis, the second most common psoriasis in childhood (9,10), is an acute form of psoriasis usually manifesting with scaly papules on the trunk two weeks after a ß-haemolytic streptococcal or viral infection (10.) In our case, however, sore throat was not present in the past but a symptom accompanying fever, another trait not attributed to psoriasis. Moreover, the maculopapular rash promptly desquamated, whereas guttate psoriasis tends to remain for months.

This case report is limited in several ways. ASTO test, pharyngeal swab and blood culture were not performed due to limited resources in the hospital. Therefore, we were only able to diagnose scarlet fever clinically, without supporting microbiological confirmation.

Childhood exanthems are incredibly common in childhood. Despite most of them being harmless, physicians are required to be able to identify potentially life-threatening condition. Good clinical knowledge on skin morphology and natural course of disease is eminent. As morphology of the rash is often nonspecific, accompanying symptoms and careful history taking is as essential to reach an accurate diagnosis, particularly in centers with limited resources, as it is vital to differentiate and manage life-threatening exanthems.

Acknowledgements: The authors would like to express our greatest appreciation to Shannaz Nadia Yusharyahya, MD, for her valuable suggestions and guidance during the development of this article.

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