Annals of Clinical and Medical Case Reports

ISSN 2639-8109

Case Report

Hypopyon as an Unusual Complication of Varicella Infection in a Girl with Atopic Dermatitis

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Volume 4 Issue 5- 2020

Received Date: 14 June 2020

Accepted Date: 25 June 2020

Published Date: 29 June 2020

2. Key words

Varicella; Bullous impetigo; hypopyon; Staphylococcus aureus superinfection; Atopic dermatitis Patient consent: Parents´ consent were obtained

1. Abstract

1.1. Background: Varicella-Zoster-Virus (VZV) infection, also known as chickenpox, is a very common childhood affliction manifesting primarily on the skin. Typical skin lesions are small itchy single standing vesicles on erythematous skin in a generalized disseminated manner. Both cutaneous and systemic complications of the VZV-infection may commonly occur in non-vaccinated patients.

1.2. Methods and Results: A three-year-old girl with a previous history of mild atopic dermatitis presented in our Pediatric Dermatology clinic in poor general condition and a skin rash consisting of generalized large blisters with hypopyon formation and erosions. Between the blisters, scattered erythematous papules and vesicles were also visible. A positive Tzanck smear from an intact vesicle as well as Varicella-Zoster-Virus- PCR confirmed the clinical diagnosis of Varicella-Zoster-Virus infection. Cultures from hypopyon-material were positive for Staphylococcus aureus without methicillinresistance. The patient recovered completely under hospital isolation and systemic treatment with antivirals and antibiotics, supportive therapy and topical treatment within ten days.

1.3. Discussion and Conclusion: Hypopyon formation is rarely reported in autoimmune blistering diseases but not yet in varicella infection neither in atopic dermatitis in children. Our exceptional case nicely underscores the necessity of early VZV-vaccination, available and recommended now for more than ten years in pediatric vaccination programs to avoid severe complications.

3. Introduction

Varicella-Zoster-Virus (VZV) is the causative agent of varicella (chickenpox) as primary infection and herpes zoster (shingles) as re-activation of the virus [1]. The primary infection is usually transmitted by the inhalation of airborne droplets exhaled from infected hosts. Chickenpox is largely a childhood disease and still very common in Austria. The most common complication in children is bacterial superinfection of skin and soft-tissue due to itch arising from varicella. Atopic dermatitis (AD) is a chronic pruritic inflammatory skin disease, typically starting in early infancy in genetically predisposed persons [2]. In patients suffering from AD, the skin is often colonized by S. aureus [2], this additionally may lead to S. aureus superinfections and AD deterioration [3].

4. Case Report

A three-year-old, otherwise healthy girl suffering from mild atopic dermatitis (AD) (SCORAD index of <25) presented in our Pediatric Dermatology Outpatient Clinic in reduced general condition with high grade fever and a new skin rash. Her skin exhibited generalized blisters, of 2-5 cm in diameter, partly translucent partly with pus accumulation in the dependent part of the flaccid bullae forming a transverse fluid level (hypopyon formation), [4, 5] erosions were visible at sites of ruptured blisters (Figure 1b, c, d). Only a single plump blister on intact skin of the left arm was visible as the primary lesion (Figure 1a). Further inspection revealed pinhead-sized papules, vesicles, pustules, erosions and crusts surrounded by erythematous skin disseminated between the large blisters (Figure 1b, c, d). Palms, soles, scalp as well as genital and oral mucosa were disease-free. Rapid diagnosis was made by Tzanck smear from a small intact vesicle revealing multinucleated giant cells and acantholytic keratinocytes. Herpes Polymerase-Chain- Reaction from both serum and blisters were positive for Varicella-Zoster-Virus (VZV). VZV-serology demonstrated a recent infection (IgM antibodies positive, IgG antibodies negative). In addition, bacterial culture from the skin smear revealed superinfection with Staphylococcus aureus without methicillin-resistance.

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Author Contribution: T Kinaciyan, A. Gorris, W. Weninger. Hypopyon as an Unusual Complication of Varicella Infection in a Girl with Atopic Dermatitis

Citation: Kinaciya T, Hypopyon as an Unusual Complication of Varicella Infection in a Girl with Atopic Dermatitis. Annals of Clinical and Medical Case Reports. 2020; 4(5): 1-3.

Immediately after diagnosing chickenpox in the non-VZV-vaccinated girl combined with bullous impetigo and hypopyon formation due to Staphylococcus aureus superinfection on the basis of atopic skin and VZV infection, the patient was isolated at the pediatric ward and received acyclovir 130 mg TID (10 mg/kg/day) and amoxicillin/clavulanic acid 650 mg TID (50 mg/kg/day) intravenously for 5 days. She also got parenteral fluid substitution, paracetamol infusions and oral antihistamines. Subsequently, treatment was switched to oral therapy for an additional five days. She was discharged after 10 days. The topical treatment consisted of Neomycin-sulfate powder on intact blisters and Methylprednisolone-aceponate 0.1% cream plus sterile paraffin-gauze dressing of the erosive skin. She recovered completely, only some eczema plaques persisted from the known AD (Figure 2a, b, c).

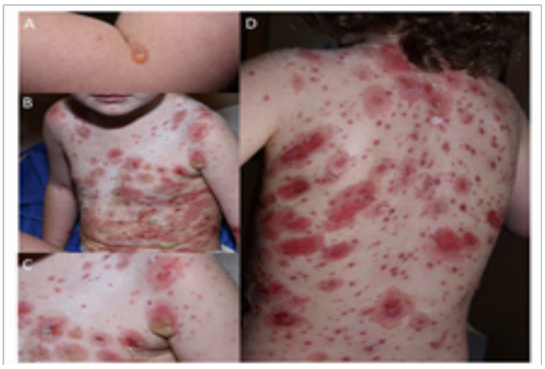

Figure 1: (a) single plump blister on intact skin as the primary lesion; (b, c, d) generalized blisters 2-5 cm in diameter, with pus accumulation in the dependent parts (hypopyon formation), erosions at sites of ruptured blisters and pinhead-sized papules, vesicles, pustules, crusts surrounded by erythematous skin disseminated between the large blisters.

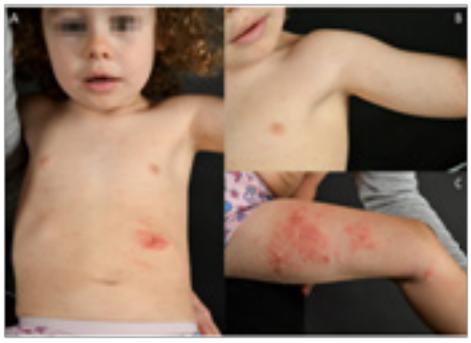

Figure 2: (a, b, c) S. aureus and VZV infection healed without any scars and residue revealing some eczema plaques; (c) Mollusca contagiosa, another AD associated viral superinfection, on the legs that were masked before.

5. Discussion

VZV infection is a common, airborne-droplets transmitted primary, highly contagious, acute childhood infection with typical morphology and distribution of skin lesions easy to diagnose for the trained clinician [1]. While the prognosis is generally good, hospitalization rate is about 6 out of 100,000 children aged 0-15 years [6]. The most common complication in 31 to 70% of all cases is systemic bacterial superinfections and superficial skin infections account for 20 to 50% [7]. Bacterial superinfections are facilitated by skin barrier disruption due to itch and skin excoriation and possibly by transient virusinduced alterations of local immunity followed by staphylococcal infection syndromes [7]. Raulin et al., analyzed the profile of S. aureus-specific toxins in varicella superinfections and highlighted that severe forms are mostly related to Methicillin-resistant Staphylococcus aureus (MRSA) strains [7]. In our patient, smears culture where fortunately negative for MRSA. Hypopyon is rarely reported in secondarily infected vesiculobullous autoimmune disorders7 but not yet in varicella infection neither in atopic dermatitis in children.

In several European countries and the United States VZV vaccination is a fixed component of vaccination programs for children between the 12th and 18th month of life.6 Since 2010, the Austrian vaccination program strongly recommends and provides VZV vaccination for children at the beginning of the second year, which represents the best prevention of infection-associated complications but its implementation is still very inconsistent. A change in the incidence of the infection and its complications can only be expected after nationwide vaccination [8, 9].

6. Conclusion

The peculiarity of our case is that i) the typical distribution of chickenpox was missing as palms, soles, scalp as well as oral mucosa were disease-free, ii) predominant large blisters and unusual hypopyon formation were almost masking the acute VZV-infection, iii) although bacterial superinfections are common in chickenpox, hypopyon formation has, to the best of our knowledge, not been reported yet. In addition, our case nicely underscores the necessity of early VZV-vaccination in children to avoid severe complications and hospitalization.

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