Serratia marcescens infection presenting with papillovesicular rash similar to varicella zoster infection: a case report

Aysenur Bahadir, Erol Erduran
Department of Pediatric Hematology-Oncology, Karadeniz Technical University Faculty of Medicine, Trabzon, Turkey

ABSTRACT
According to the literature, skin manifestations related to Serratia marcescens infections are rarely seen, and observed mostly in immunosuppressed adult patients. Cellulitis, abscess, granulomatous lesions have been reported as skin manifestations of Serratia infections. In our 2 cases with leukemia, papillovesicular rashes were observed resembling those of varicella zoster infection. Serratia marcescens was grown on blood cultures of patients susceptible to meropenem. The patients recovered from the rashes rapidly after treatment. Based on the absence of similar case reports in the literature, we report these two pediatric cases to emphasize that Serratia marcescens infections can present with papillovesicular rash similar to that seen in varicella zoster infections.

Key words: Catheter; leukemia; papillovesicular rash; serratia, varicella.

Serratia marcescens is a gram-negative, opportunistic and nosocomial pathogen belonging to the Enterobacteriaceae family. It is often found in intensive care units, and most importantly grown in the digestive, respiratory and urinary systems, and newborn perineums and health workers. The incidence of S. marcescens-derived nosocomial infections is only 1-2%; while the main sources of risk for Serratia infections in hospitals for bacteremia/sepsis are intravenous, intraperitoneal and urinary catheters [1, 2].

Cutaneous manifestations of S. marcescens infections have been reported as ulcer, abscess, granulomatous and nodular skin lesions [2]. S. marcescens infection-related cutaneous manifestations in pediatric population are rarely reported in the medical literature. Herein, we report two pediatric cases presenting with papillovesicular rash caused by S. marcescens but misdiagnosed as varicella zoster virus (VZV) infections.

CASE REPORTS
Case 1 – A three-year-old female patient was diagnosed with low-risk acute lymphoblastic leukaemia (ALL) in our pediatric hematology clinic, and her treatment was initiated according to the St. Jude
Total XV chemotherapy protocol. A central venous catheter (CVC) was placed on the 5th day of her hospitalization. Neutropenic sepsis developed on the 5th day of her hospitalization while the patient was on chemotherapy. Blood culture was obtained from the patient, and the patient was put on 100 mg/kg of cefepime and 15 mg/kg of amikacin therapy. Growth of Gram-negative bacilli was observed in her blood culture, and the patient developed antibiotic-resistant fever. As a consequence, cefepime treatment was discontinued on day 2, and 120 mg/kg of meropenem treatment was started. Growth of meropenem-sensitive S. marcescens was observed in both CVC and peripheral blood cultures. On the third day of antibiotic therapy, vesiculobullous rashes originating from the dorsum of the hand and abdomen developed which spread to the scalp the next day. The lesions were not itchy, and didn't invade the mucosa.

A sample was tested for VZV IgM based on the resemblance of the lesions to those of a VZV infection, and acyclovir (30 mg/kg/d) treatment was started. After the 48th dose, the patient's body temperature started to decrease, returning to a normal level during the follow-up period. Within 3-5 days rashes diminished and the patient fully recovered. When VZV IgM test results became negative, acyclovir treatment was discontinued. Her skin lesions diminished and healed within three days. Besides, the patient's fever began to drop down on the second day of meropenem treatment. Acyclovir treatment was discontinued after negative VZV IgM test results were obtained. CVC catheter was removed after S. marcescens growth on catheter was twice than that observed in the blood culture. Meropenem treatment was discontinued on the 15th day of hospitalization at the time when microorganism growth in the peripheral blood culture was not observed, however chemotherapy was maintained.

DISCUSSION

According to the literature, skin manifestations are rarely seen in S. marcescens infections, and they are mostly observed in immunosuppressed adult patients. Skin lesions that develop during Serratia infections are classified in two groups. The lesions start as acute cellulitis or abscesses, and may turn into ulcers or even severe necrotizing fasciitis and may take on a chronic form. On rare occasions, granulomatous lesions that start as nodules have been observed in the chronic form [2, 3, 4].

Skin manifestations related to Serratia infections in pediatric cases are rarely reported, although Garcia et al. reported a case of a 10-year-old child diagnosed with S. marcescens, who had skin manifestations in the form of erythematous plaques on
S. marcessens growth was observed in both of their peripheral and CVC blood cultures. The VZV IgM results in both cases turned out to be negative, and so it was deduced that the patients' rashes were associated with a S. marcessens infection. However, in immunocompromised patients, VZV antibody test may be false negative [6]. Patients must be followed closely. In our case, acyclovir therapy was discontinued because the serology was negative for VZV and the patients' lesions began to lessen rapidly after meropenem treatment was initiated. Also, Enterovirus can be the cause of vesicular rash in immunocompromised patients [7]. However, we examined the oral cavity and couldn't find any lesions, so it was not considered as an Enteroviral infection.

A variety of skin rashes due to drug reactions can be seen. Most frequently antibiotics and anti-inflammatory drugs are causing drug-induced rashes [8]. In our cases, skin rashes began to emerge after meropenem treatment. However, meropenem was previously used in our patients without development of allergic reactions. In addition, the lesions were not itchy and disappeared with meropenem treatment. Therefore, skin rashes were not considered as manifestations of drug allergy.
In the first case, the rashes started in the vesicular form located on the arms and legs turning into painful nodular lesions with time. The disease of the patient followed a course similar to the cases of Serratia-infection reported in the literature [2]. Some of these nodules developed into abscesses which were drained.

Maybe, this vesicular rash can be considered as an early sign of nodular lesions. However, these nodular lesions were not observed in our second case.

Serratia infections are more frequently observed in cases with immune deficiencies and may have diverse disease courses. Early diagnosis and treatment are vital in cases with both Serratia and VZV infections, as both diseases can be fatal.

Based on the absence of similar case reports in the literature, we report these two cases to emphasize that: i) *S. marcescens* infections can also lead to development of a papillovesicular rash similar to that seen in VZV infections, ii) *S. marcescens* infection should be considered, when papillovesicular rashes are observed in immunosuppressive patients with an implanted CVC *in situ*.

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