Case report: Molluscum contagiosum

Toxic shock syndrome following cantharidin treatment

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Molluscum contagiosum is a common childhood viral infection of squamous epithelia that generally appears on skin as waxy, dome-shaped papules.[1] Lesions sometimes regress spontaneously in immunocompetent children, and some experts advise that "benign neglect" is the most appropriate therapeutic approach in most cases.[2]

Other accepted treatments are mechanical removal, topical vesicants (eg, salicylic acid, cantharidin), electrocautery, and liquid nitrogen.[3] Cantharidin preparations are banned by the Food and Drug Administration (FDA) in the United States, although pure cantharidin and flexible collodion can be purchased as separate items and mixed by clinicians.[4] Cantharidin is available in Canada in a variety of topical preparations.

We report a case of toxic shock syndrome (TSS) within 24 hours of topical application of a cantharidin preparation for cosmetic treatment of molluscum contagiosum in a previously well preschooler. Because family physicians frequently see molluscum contagiosum and could be using cantharidin, this case raises some concern.

Case report

A 4-year-old boy came to the emergency department with fever, diarrhea, vomiting, and a decreased level of consciousness. One day before onset of the illness, topical cantharidin (Catharone) had been applied to about 20 molluscum contagiosum lesions on his chest wall and then covered with a transparent, occlusive, waterproof surgical tape. That evening he complained of pain over the treated area and slept poorly. During the night he began to vomit and had loose nonbloody mucous stools, red eyes, and a generalized skin rash. Next morning, his level of consciousness decreased.

The boy was brought to the emergency department, where he was found to be cyanotic, unresponsive to pain, and febrile (39°C). His heart rate was 202 beats/min, and his blood pressure was not measurable. His neck was supple. There was bilateral nonpurulent conjunctival injection and well demarcated weeping erythematous bullae over his right chest wall without induration or swelling of the underlying skin (**Figure 1**). He had blotchy, blanching macular erythroderma on his arms and legs.

The child required intubation, ventilation, volume resuscitation, and inotropic support. Vancomycin (60 mg/kg daily, divided every 6 hours), cefotaxime (200 mg/kg daily, divided every 8 hours), and clindamycin (35 mg/kg daily, divided every 8 hours) were administered intravenously. Within 48 hours, he was hemodynamically stable, afebrile, and extubated.

His white blood cell count was 6.2 x 10^9/L with 63% bands, 22% neutrophils, 12% lymphocytes, and 2% monocytes. His hemoglobin was 104 g/L, platelet count 180 x 10^9/L. His serum creatinine was 128 µmol/L (reference value 10-50) and urea 7 µmol/L (reference value 2-7). On admission alanine aminotransferase was 39 U/L (reference value 10-25) and aspartate aminotransferase was 57 U/L (reference value 15-50); within hours these had risen to 71 and 211, respectively. A Gram stain of serosanguinous fluid from his chest wall showed Gram-positive cocci in clusters and chains. Cerebrospinal fluid was normal, and cultures of blood, urine, and cerebrospinal fluid were sterile. There was no evidence of lower respiratory tract infection

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on his chest radiograph, and computed tomography of his head was normal. A culture of serous fluid from skin bullae grew *Staphylococcus aureus*, which produced toxic shock syndrome toxin-1 (TSST-1) in the laboratory of one author (P.M.S.) using established methods.[5]

The antimicrobial drugs were changed after 5 days to oral cloxacillin (150 mg/kg daily, divided every 6 hours) to complete a 10-day course. The lesions on his chest wall healed with hypopigmented scarring; desquamation was not observed.

Figure 1. Erythematous weeping bullae on a child who developed TSST-1–associated toxic shock syndrome after topical treatment of molluscum contagiosum with a cantharidin preparation

Discussion

Cantharidin is a potent vesicant used to remove benign epithelial growths, such as verruca vulgaris or molluscum contagiosum. The active ingredient is a blister beetle–derived protein phosphatase inhibitor that penetrates the epidermis and causes acantholysis.[6] In experienced hands cantharidin preparations have been reported safe and effective.[1,4] Reports of lymphangitis with lymphedema and cantharidin poisoning, however, led the FDA to conclude that the hazards associated with its use outweigh any benefits (**http://www.fda.gov/cder/fdama/draft4.pdf**). In this case we believe that the occlusive tape allowed the cantharidin to spread to normal skin, resulting in large blisters. This was a conducive environment for TSST-1 production by commensal *Staphylococcus aureus,* which then had a direct portal of entry over a large surface area.

Toxic shock syndrome was first described among children with localized staphylococcal infections,[7] although the most intense interest has centred on its association with young women's use of tampons during menstruation.[8] In 1999 the Centers for Disease Control and Prevention's passive surveillance system reported an incidence of TSS in children younger than 15 years of fewer than 0.05 cases per 100 000 population. Of the 50 cases of TSS in children 5 years of age or younger reported between 1979 and 1996, more than half were in children 2 years or younger, and most (61.7%) were associated with non-surgical cutaneous lesions.[8] Younger children could be at higher risk of TSS because they have no TSST-1 antibody.

The toxin of TSS is one of a family of bacterial superantigens that bypass normal antigen presentation and directly and massively activate T cells causing massive cytokine release.[9] Cytokine release accounts for the clinical presentation of TSS, which includes high fever, diffuse erythroderma, hyperemia of mucous membranes, rapid-onset hypotension, and consequently, abnormal renal, hematologic, and liver function tests.

Empiric treatment of suspected TSS, in addition to supportive measures, should include a β-lactamase–resistant antistaphylococcal antibiotic and a protein synthesis–inhibiting antibiotic (such as clindamycin).[3] Clindamycin interferes with TSST-1 production in vitro.[10] The role of intravenous immune globulin is controversial.[3] When symptoms suggest TSS, clinicians should determine whether a localized focus of infection or infected foreign body serves as a source. Other illnesses in the differential diagnosis include Group A streptococcus and *S aureus* infection, Kawasaki disease, and measles.

Although TSS is uncommon, physicians should be aware that it can occur in young children without active staphylococcal infection who have *S aureus* colonization. A literature search from 1980 to 2001 using the MeSH terms "toxic shock syndrome" and "cantharidin" did not yield any reports of this syndrome's occurring after application of topical cantharidin. The risk of serious adverse events associated with this blistering agent should be considered when counseling parents about treatment of benign skin growths. If cantharidin preparations are used, it should be recognized that this potent medication can cause extensive damage to normal skin. We suggest that, if benign skin growths are treated, limited areas should be treated at a time. Application of paper tape over

treated areas, to be left on for a few hours, is recommended to prevent ingestion of vesicant by children or spread of the agent after application. Occlusive tape can increase absorption of cantharidin, intensify blister formation, and increase the risk of adverse events, and is therefore not recommended.

Conclusion

This case highlights a potentially life-threatening complication of cantharidin use for a common skin condition.

Competing interests

None declared

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Editor's key points

- A 4-year-old boy suffered toxic shock syndrome caused by *Staphylococcus aureus* following application of cantharidin to about 20 molluscum contagiosum lesions on his chest.
- A key feature, likely to have precipitated this extreme reaction, was the application of occlusive surgical tape over the lesions, permitting more extensive damage to the skin than expected.

Points de repère du rédacteur

- Un garçon de 4 ans a été victime d'un syndrome de choc toxique causé par le *Staphylocoque doré* après l'application de cantharidine sur une vingtaine de lésions de molluscum contagiosum sur la poitrine.
- En provoquant des lésions cutanées supplémentaires, la mise en place d'un pansement occlusif (ruban adhésif de chirurgie) sur les lésions est probablement ce qui a précipité une réaction aussi grave.