

**IJCRR**

Vol 06 issue 12

Section: Healthcare

Category: Case Report

Received on: 13/05/14

Revised on: 01/06/14

Accepted on: 12/06/14

CANTHARIDIN POISONING IN TWO MONTH OLD INFANT: CASE REPORT

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ABSTRACT

Cantharidin is a lipid soluble irritant extracted from the blister beetle. Manifestations of cantharidin poisoning range from local vesiculobullous formation to systemic manifestations involving central nervous system, renal system and gastrointestinal system. We report a case of systemic cantharidin toxicity in 2 month old infant secondary to cutaneous cantharidin toxicity which was managed conservatively and discharged in good health after 6 days.

Keywords: Cantharidin, poison, blister beetle, infant, Saudi Arabia

INTRODUCTION

Cantharidin (haemolymph exudation through leg joints or/and antennal pores) is among the most widely known insect natural products and primarily found in the true blister beetles, Meloidae, and secondarily in false blister beetles, Oedemeridae. It was discovered in haemolymph and gonads of the blister beetle, commonly known as Spanish fly *Lytta vesicatoria* (Linnaeus), in quantity larger than any other member of blister beetles. It is one of the oldest-known toxins from insects and has been known to humans for more than 2000 years due to its physiological activities such as blistering. Also, it is highly toxic to a wide variety of animals, including birds, amphibians and mammals.¹

Historically, the best known true blister beetle is the Spanish fly *Lytta vesicatoria* Linnaeus which fills its breathing tube with air and closes its breathing spiracles (pores) to elevate body pressure in order to force out some droplets of haemolymph containing the toxic cantharidin through its leg joints. Taken internally or absorbed through the skin, cantharidin (or cantharides) is highly toxic to mammals. For man, the most

common beetle injury is not from a bite or sting but from the formation of blisters (dermatosis) when roughly contacted with the soft skin and from the cantharidiasis (cantharidin poisoning) when ingested orally.¹ Few cases of cantharidin toxicity were reported in pediatrics through ingestion of the beetle itself but as far as we know there is only one reported case of cantharidin toxicity due to skin blistering secondary to skin contact with the beetle.

In this case, we report cantharidin toxicity in 2 months old infant after skin contact with beetle blister.

CASE REPORT

A 2 -month - old Saudi girl previously healthy presented with one attack of generalized tonic clonic convulsion for 5 minutes. Convulsion was associated with high grader fever and irritability which started 2 days before. The girl had 3 attacks of coffee ground vomitous and 3 to 5 attacks of watery diarrhea with mucus but no blood. Her oral intake was poor. Her urine was concentrated and the color was dark yellow. There was no history of skin rash or contact with sick patient. She has no

history of previous seizures or other medical problems. She is developmentally normal. Family history is noncontributory. Her family has no medical problems and living in Khamis Mushayt city (Aseer region) in the Southwest of Saudi Arabia.

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On arrival to pediatric emergency, she was in hypovolemic shock with Glasgow coma scale of 11/15. Capillary refill time was more 3 seconds. She was hypotensive with blood pressure of 70/32 mm Hg. Pulse rate was 160/minutes. Respiratory rate was 54/minutes and temperature was 39°C. She was maintaining normal oxygen saturation at room air. The examination of the heart, respiratory system, gastrointestinal system was normal. She had hypertonia and hyper-reflexia for both upper and lower limbs with no apparent skin rash initially.

Immediately, resuscitation was started with normal saline boluses and she showed response after the second bolus of normal saline informs of improving her blood pressure but she continued to be irritable.

Her initial complete blood count showed leukocytosis (29000/cc), normal hemoglobin level (12.3 mg/dl) and normal platelets count (238000/cc). Blood urea nitrogen was 161 mg/dl and creatinine was 2.3 mg/dl. Her serum sodium was 156 mmol/l, potassium 4.8 mmol/l, calcium was 6.7mg/dl and serum ammonia was 157 mmol/l. Alkaline phosphatase was 351 u/l, serum alanine aminotransferase (ALT) was 275 u/l, Serum aspartate aminotransferase (AST) was 279 u/l and lactate dehydrogenase was 1215. Total bilirubin was 1.8 mg/dl. Her blood gases showed severe metabolic acidosis, PH:7.0, PCO₂:27 and HCO₃:10. Blood gases were normalized after 24 hours.



Figure 1: 2 small ulcers with dirty sloughing base and ragged edges which was found during physical examination

After stabilization she was shifted to pediatric ICU for close monitoring and management. Full sepsis screening was done including cerebrospinal fluid analysis and culture and was started on broad spectrum antibiotics. In the second day, her hemoglobin dropped to 7.2 mg/dl and here urine analysis showed numerous RBCs with 2 plus proteins and he was transfused with packed RBCs.

During physical examination on day 2, a oval shape raised redness was observed on the lower part of the neck on the right side (Figure 1). It was about 1.5 by 1.0 cm in size in the middle of the redness there were 2 small ulcers with dirty sloughing base and ragged edges. The family did not notice this redness before but they mentioned that a beetle was seen in the clothes of the girl near

to the site of redness earlier before the girl got sick. The family was asked if they can bring the beetle, which was brought in an empty water bottle (Figure 2). From here the beetle was identified to be *Hycleus maculiventris* (the family Meloidae) and the girl sickness was explained.

The girl was continued on supportive care and she was improving with time and discharged on day 6 with completely normal clinical status and laboratory results. The sepsis screening which was done and came to be normal.



Figure 2: *Hycleus maculiventris* insect which was in contact with the infant at the site of the ulcer.

DISCUSSION

The case above described cantharidin toxicity resulting from the contact of blister beetles with the infant body. The beetle in this case was positively identified as *Hycleus maculiventris* (the family Meloidae). These beetles emit cantharidin laden body secretions which cause painful blisters and lesions on human skin when touched. Beetles of this species are usually black and yellow in colour with some being black and red, and others being all black.³ The bright colours that may warn would be predators, can unfortunately be attractive to children.

Percutaneous absorption of cantharidin leading to systemic toxicity must not be under-rated since its high lipoid/ water partition coefficient permits rapid diffusion across the stratum corneum.¹⁰ As far as we know, this is the youngest patient who presented with cantharidin toxicity. There are few cases of cantharidin toxicity in children secondary to ingestion of the blister beetle.^{2,4,6} The clinical presentation was almost the same. Usually it starts by vomiting and abdominal pain shortly after the ingestion of the insect with drowsiness,^{2,4,6} Associated with fever in 3 patients.

Some of those patients presented with gastrointestinal bleeding with different degrees and some with increasing liver enzymes.⁴ One patient presented with seizure.⁴ Renal involvement was there in most of patients with microscopic or gross hematuria with renal impairment and electrolytes disturbance.^{2,4,6} Usually, the diagnosis was made by identifying the insect in the vomitus. The treatment were supportive in all cases and all patients were discharged in good health without any complications except one who died may be secondary to ingestion of large amount of insects.³ There is only one report of cantharidin toxicity in children secondary to skin contact with blister beetle.² He presented with multiple blebs on his face and hand after touching the blister beetle and shortly after that he started to have hematuria then he became quite deeply stuporous. The child's urine contained much protein and numerous erythrocytes and leucocytes, in proportions similar to those of whole blood. No ova were seen (vesical schistosomiasis does not occur in this district), and no organisms were found on examination of the fresh specimen or after staining. No casts were

seen.² The blood showed a leucocytosis of 12,300 cells per cc. Leukocytosis was present in most cases of cantharidin toxicity including our patient. According to Craven and Polak (1954), cantharidin has a specific effect of inducing a leukoerythroblastic response.⁶ The faeces, though macroscopically normal, contained numerous erythrocytes. The bullae on skin and mucosa increased in size, coalesced, and then burst, leaving ulcers with a dirty sloughing base and ragged edges. He improved in 3 days time and went home in good health.² In our report, the age of the child makes things difficult. She presented with high grade fever with seizure. This raised the possibility of central nervous system infection. The abnormal renal profile and electrolytes disturbance, can be explained initially by pre-renal hypovolemic shock and sepsis. The diagnosis of cantharidin toxicity was suspected after observing the skin lesion (most likely during the stage of ulcer) and by obtaining more history from the family about any presence of such insects at home and then by identification of the insect the diagnosis was made. In adults, there are a lot of reports about cantharidin toxicity^{9,11} and some reports about toxicity in animals.⁸ Spanish flies and other meloids have historically been used medicinally as aphrodisiacs, skin irritants, vesicants and abortifacients,^{1,4,10} such uses cause many cases of toxicity in adults.

All patients with cantharidin were treated by general supportive measures based on the clinical presentation and they did well. There is no anti dote for cantharidin^{1,4,6}

For topical exposure, the affected area should be cleaned with acetone, ether, fatty soap or alcohol, which helps to dissolve and dilute the cantharidin. Topical steroids may be applied to intact skin if it is symptomatic.⁷

CONCLUSION

Cantharidin toxicity is difficult to diagnose and cases can be missed especially in young infants in the absence of history about contact with the

insect. Awareness about such kind of presentation and high index of suspicion is highly needed.

ACKNOWLEDGMENT

Authors acknowledge the immense help received from the scholars whose articles are cited and included in references of this manuscript. The authors are also grateful to authors/editors/publishers of all those articles, journals and books from where the literature for this article has been reviewed and discussed.

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