

Clinical Tetanus in an 11 year old boy

Abstract:

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Introduction

Following the implementation of a successful vaccination programme, there are many infectious diseases we consider effectively dealt with, almost to the point of eradication, tetanus is one such condition that the majority of currently practicing clinicians will never encounter. We report a recent case of tetanus in an unvaccinated 11-year old Irish boy.

Case Report

An 11-year old boy presented to the emergency department (ED) 12 days following a puncture wound to his right foot sustained while playing barefoot outdoors. Four days prior to presentation, he experienced pain in his left jaw and teeth, and over the following two days developed chest tightness, and became unable to open his mouth fully, tolerating only pureed food and liquids. He attended his general practitioner (GP), and was commenced on amoxicillin/clavulanic acid for a possible dental infection. Owing to worsening symptoms he presented to his GP at which time clinical tetanus was suspected and he was referred to the ED; no medical history of relevance; the child was unvaccinated. On examination, the patient was noted to be well in no acute distress, vital signs within normal range for age. Of significance, there was marked spasm of the patient's jaw muscles with limited opening demonstrated (Figure 1). Neurological exam revealed hypertonicity of upper and lower limbs with brisk deep tendon reflexes throughout; gait was scissoring in nature. At the site of the initial foot injury, was a small eschar with minimal local tenderness. The remainder of the examination was unremarkable.

Baseline laboratory investigations were all within normal range. Baseline tetanus toxoid level was negative. Wound debridement and cleansing of the puncture wound site revealed a one-inch thorn which was removed from the patient's foot (Figure 2). Intra-operatively obtained samples of purulent material failed to identify any anaerobic pathogens, *Staphylococcus aureus* was identified from aerobic plates. Intramuscular tetanus immunoglobulin 5000 IU (150 IU per kg) was administered. The patient completed a 10-day course of flucloxacillin and metronidazole. Apart from naso-gastric feeding (severe tongue swelling and ulceration) and repeated painful muscle spasms for a 7-day period, the patient had an uncomplicated hospital course. The patient remained hospitalised for 17 days, 9 in the intensive care unit. Tetanus immunisation (6:1 vaccine) was commenced prior to discharge; despite advice and education, his siblings remain unvaccinated.

Discussion

Tetanus can be acquired at any point in an unvaccinated child's life; a rare clinical entity but with associated mortality figures approaching 50%. Tetanus has been a notifiable disease in Ireland since November 1981, in the intervening 31 years there have been 12 reported cases (most recently in 2008), no reported cases in children to date. Of the 12 cases there were 2 deaths in individuals > 60 years old. The last reported case in the United Kingdom was in 2004, an incompletely vaccinated 8-year old Asian child. As with the case reported here a trismus or lockjaw is one of the classic presenting symptoms noted in infected individuals due to painful spasm of the muscles of mastication. Additional clinical findings include, risus sardonicus, neck retraction, difficulty in swallowing, dysphasia, spasms, hyper-salivation and intense muscle rigidity. Diagnosis is typically based on clinical findings and is supported by isolation of *Clostridium tetani* from wound cultures (rare), or the detection of circulating unbound tetanus toxin (10% of cases).

The most common cause of death in individuals with severe tetanus in the absence of mechanical ventilation is spasm-related respiratory failure, whereas in ventilated patients it is tetanus-associated autonomic dysfunction. Benzodiazepines are typically indicated for the management of muscle spasms however doses required for clinical benefit typically result in excessive sedation. Current evidence suggests the benefit of magnesium sulphate for the control of both severe spasms and autonomic dysfunction. Metronidazole (7 to 10 days) is the antibiotic of choice although evidence to support eradication of *C. tetani* with antibacterial therapy alone is not beneficial without adequate wound debridement.

Tetanus immunoglobulin (3000 to 6000 units) is administered once the diagnosis is clinically suspected to neutralize any unbound toxin, followed by active tetanus immunization two weeks later as immunity against tetanus is not produced following acute illness. Tetanus vaccine provides protection in 90-95% of children who are fully vaccinated. The childhood immunisation schedule in Ireland recommends children receive a dose of tetanus toxoid-containing vaccine at 2, 4, and 6 months of age and booster doses at 4-5 years and 11-14 years old. This case highlights the importance of awareness of tetanus especially in non-immunised individuals; the importance of ensuring adequate tetanus prophylaxis in the routine ED setting is also highlighted.

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