Tetanus: A case report

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A seven-year-old unimmunized girl presented to the emergency department with dramatic findings of tetanus eight days after puncturing herself with a wooden stick. The clinical course and treatment of generalized tetanus are reviewed. The immunization recommendations for traumatic wounds are presented.

Key Words: *Immunization, Puncture injury, Tetanus*

Tétanos : rapport de cas

RÉSUMÉ : Une fillette de sept ans, non immunisée, a été amenée au service des urgences avec des signes flagrants de tétanos, huit jours après s'être blessée avec un bout de bois. L'évolution clinique et le traitement du tétanos généralisé sont passés en revue. Les recommandations quant à l'immunisation en présence de blessures traumatiques sont présentées ici.

Tetanus is uncommon in Canada. The last published report of tetanus in Canada was in July 1992 (1). Tetanus results from inoculation of a susceptible wound with *Clostridium tetani*. A case of generalized tetanus is discussed.

CASE PRESENTATION

A seven-year-old, right hand dominant, unimmunized, Mennonite girl suffered a through and through puncture wound to the first web space on her right hand with a sharp stick. A fragment of wood was retained in the wound, and no attempt was made to remove it. Eight days after the injury, the child presented at the emergency department of the local hospital with severe neck and back pain, dysarthria, dysphagia and trismus (Figure 1). She was immediately referred to a tertiary care children's hospital.

At the children's hospital she received diazepam, metronidazole and tetanus-diphtheria vaccine, as well as both intramuscular (750 U) and intralesional (250 U) human tetanus immune globulin (HTIG). The wound was irrigated and debrided, and the fragment of wood was removed (Figure 2).

The patient was transferred to the intensive care unit, where her spasms worsened and respiratory difficulties arose, leading to intubation and ventilation. An early tracheostomy was performed. Vecuronium, morphine and midazolam infusions were required for the majority of her four-week stay in the intensive care unit. Over this period she developed hypertension as a result of autonomic instability, which was controlled with labetalol.

Five weeks after admission the patient was discharged. She did not suffer major sequelae. Complete immunizations were arranged for the patient and her siblings.

DISCUSSION

C. tetani is a large spore-forming anaerobic Gram-positive bacillus. It is shaped like a club with a spore at one end. The bacteria produces two toxins: tetanolysin and tetanospasmin. Tetanospasmin causes the clinical picture of tetanus, while the role of tetanolysin is not known. Tetanospasmin enters the central nervous system via axonal transport in peripheral nerves and causes disinhibition of the motor and autonomic systems. Uncontrolled muscle contraction is the result (2).

Our report gives an overview of the recommended treatment protocol for generalized tetanus. The primary concern is maintaining airway and ventilation. Intubation is usually

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Figure 1) A seven-year-old unimmunized girl presented to the emergency department with severe neck and back pain, dysarthria, dysphagia and trismus eight days after puncturing herself with a wooden stick

required. Early tracheostomy is recommended because of the prolonged course of tetanus with the attendant requirement for ventilation. Control of the tetanic spasms is obtained with benzodiazepines and often neuromuscular blockade. Sedation is desirable and is produced with benzodiazepines (3). Passive immunization with HTIG is recommended at a dose of 500 U intramuscularly. Lower doses (500 U) appear to be as effective as large doses (10,000 U) of HTIG (4). There is no benefit of injecting HTIG directly into the wound (2). At a site distant from where the HTIG is administered, 0.5 mL of adsorbed tetanus toxoid vaccine should be administered. Antibiotic therapy – preferably using metronidazole instead of penicillin – should be given intravenously for seven to 10 days (5). Appropriate wound management is necessary depending on the status of the wound.

Nutritional requirements are addressed by the placement of a nasal feeding tube or by total parenteral nutrition (3).

The overall fatality rate for tetanus is about 30%. On average, the intensive care unit stay is one month for patients with tetanus. Long term neurological sequelae are not common in survivors (2).

Figure 2) The wound was irrigated and debrided, and the fragment of wood was removed

TABLE 1
Recommendations for tetanus immunization in wound management

History of adsorbed tetanus toxoid (doses)	Tetanus-prone wounds		Nontetanus-prone wounds	
	Tt*	TIG	Tt*	TIG
Unknown or < 3	Yes	Yes	Yes	No
≥3 [†]	No [‡]	No	No [§]	No

*For children younger than age seven years, diphtheria-polio-tetanus vaccine may be considered; [†]If only three doses of fluid toxoid have been given a fourth dose of adsorbed toxoid should be given; [‡]Yes if more than five years since last dose; [§]Yes if more than 10 years since last dose (more frequent boosters are not needed and can accentuate side effects). TIG Tetanus immune globulin (human); Tt Tetanus toxoid adsorbed (for adult use)

The recommendations for tetanus immunization in wound management are listed in Table 1 (6). Tetanus toxoid is an effective vaccine. Completion of a primary vaccination regimen provides immunity to tetanus for 10 years in at least 95% of patients receiving vaccination. Booster doses are recommended every 10 years (1).

This case underscores the importance of tetanus immunization and reminds us of the severe consequences of tetanus.

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