

Severe Tetanus - In Spite of Tetanus Toxoid

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Summary

A 66-year-old man sustained an injury to his right foot while gardening. Despite receiving tetanus toxoid one hour later and adequate wound toilet, he developed severe tetanus complicated with autonomic dysfunction six days later. He died 20 days after admission. This case shows that tetanus toxoid alone may not be sufficient to prevent tetanus in wounded patients. Careful consideration must be given to the immune status of the patient and to the nature of the wound sustained. Incompletely immunised patients or patients with unknown immune status who sustain a tetanus prone wound should be protected with both tetanus toxoid and tetanus immunoglobulin.

Key words: Tetanus; Tetanus prophylaxis.

Case Report

A 66-year-old man was admitted to the medical ward with clinical features suggestive of tetanus. Six days prior to admission, he sustained an injury to his right foot while gardening barefoot in his backyard where he reared chicken. An hour after the injury, he was attended to by the outpatient department doctor. A 3 x 1 cm. laceration was found on the sole of the right foot. Exploration did not reveal any foreign body; the wound was then cleaned and sutured. He was also given Inj. ATT (anti-tetanus toxoid) 0.5ml. and a course of oral penicillin. His previous history of tetanus immunisation was unknown.

On admission, he was found to have trismus and neck stiffness. A clinical diagnosis of tetanus was made and he was transferred to the intensive care unit. He was given human tetanus immunoglobulin, crystalline penicillin, metronidazole and sedated with a cocktail of chlorpromazine, diazepam and phenobarbitone. However, due to frequent muscle spasms, he had to be paralysed and ventilated. Elective tracheostomy was performed on the sixth day to facilitate suction.

From the fifth day of admission, the patient developed signs of autonomic nervous system (ANS) dysfunction. He had sinus tachycardia (the rate was usually between 100 and 130 per minute but on several occasions it was between 150-200 per minute), occasional ventricular extrasystoles, widely fluctuating blood pressure (from 210/110mm to 90mm systolic), peripheral vasoconstriction with cold extremities, fever and profuse sweating. These episodes of ANS dysfunction continued till his death 20 days later. The labile swings in blood pressure and tachycardia were partially responsive to Inj. morphine and labetalol. Hypotensive episodes were treated with simple manoeuvres such as raising foot end of bed, endotracheal suction, passive movement of the limbs or raising the carbon dioxide tension.

CASE REPORT

On the twentieth day of admission, he developed severe and refractory hypotension which did not respond to treatment. Despite fluid challenge and dopamine support, he developed renal failure. The terminal stage of his illness was complicated by sinus bradycardia.

Discussion

Tetanus still constitutes one of the major public health hazards in developing countries and carries with it a high morbidity and mortality (10% - 60%).

This patient had severe tetanus because he had marked trismus, general spasticity, severe and prolonged spasms (both spontaneous and on stimulation), respiratory difficulties and autonomic dysfunction¹. Terminally, he developed protracted and refractory hypotension which may be due to ANS dysfunction, impairment of baroreceptor reflexes, dehydration, septicaemic shock, toxic myocarditis or brainstem lesions. Brain stem lesions have been found in fatal cases of tetanus and may be responsible for cardiac or respiratory arrest, progressive refractory hypotension or labile blood pressure². In the

Guidelines for antitetanus treatment of patient with open wounds.
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Tetanus Immunisation History	Risk of tetanus		
	Not tetanus prone	Moderately tetanus prone	Very tetanus prone
Type of treatment			
Fully immunised 5 yrs. since Td	None	None	None
Fully immunised and 5 - 10 yrs. since Td.	None	Td.	Td
Fully immunised and 10 yrs since Td.	Td.	Td.	Td.
Incompletely immunised or uncertain history	Td.	Td. and TIG-H +* (250U)	Td. and TIG-H (500U)*

Td - tetanus toxoid.

TIG-H - tetanus human immune globulin.

+ - tetanus immune globulin is not recommended for patients with moderately tetanus prone wounds who have had two primary doses of tetanus toxoid.

* - when giving both tetanus toxoid and tetanus immune globulin to the same patient, different syringes needles, and sites of injection should be used.

management of wounds, the question of tetanus prophylaxis often arises. Proper antitetanus treatment for a patient with an open wound depends on the patient's history of tetanus immunisations and the likelihood of contamination by tetanus bacilli. It must be stressed that active immunisation with tetanus toxoid does not provide any immediate protection in a non-immune wounded patient. Tetanus toxoid alone failed to prevent this patient from developing severe tetanus which ultimately proved to be fatal.

Prophylaxis against tetanus in wounded patients requires consideration for tetanus toxoid alone or in combination with tetanus immunoglobulin. For non-immune patients with a tetanus prone wound, passive protection is required and is best provided by human tetanus immunoglobulin (TIG). This is preferred to horse serum because it offers longer protection and is free from adverse reactions. The recommended prophylactic dose for adults is 250 to 500 units intramuscularly which ensures a protective level of antitoxin in plasma for four weeks. Administration of preformed antibodies provides immediate prophylaxis and cannot be replaced by antimicrobial prophylaxis. Tetanus toxoid can be given simultaneously but using separate syringes and separate injection sites. The patient will have to return later for the rest of the course of active immunisation.

A wound should be considered tetanus-prone if it has been exposed to a high level of bacterial contamination, is over 24 hours old at the time of treatment, or contains devitalised tissue that cannot be completely debrided³. Examples of highly contaminated sources are barnyards, sewers, waste material at meat-packing plants and bullet wounds of the colon. This patient sustained injury in his backyard where he kept chicken. The soil there must have been rich in organic matter and chicken droppings, making it a likely source for the presence of abundant tetanus bacilli. Thus the injury sustained should have been categorised as a very tetanus-prone wound. Since the previous immunisation history of patient was unknown, the patient should have received both tetanus toxoid and antitoxin for adequate prophylaxis against tetanus.

This case is reported to emphasise that tetanus toxoid alone may not be adequate to prevent tetanus in all wounded patients. The majority of patients seeking treatment for wounds are only covered with tetanus toxoid. Proper antitetanus treatment for a patient with an open wound depends on the patient's history of tetanus immunisation and the likelihood of contamination of the wound by tetanus bacilli. Incompletely immunised patients or patients with unknown immune status who sustain a tetanus-prone wound should be protected with both tetanus toxoid and tetanus immunoglobulin.

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