



## Case Report

## Generalized tetanus in an elderly patient: A case report

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## ABSTRACT

**Introduction and importance:** Tetanus is a rare disease caused by *Clostridium tetani* causing painful muscle spasms and respiratory failure.**Case Presentation:** A patient from a rural part of the country presented with a nonhealing and increasingly painful penetrating wound. The patient had a purulent wound and later developed risus sardonicus and muscle spasms of tetanus and his blood culture grew the bacteria. His condition was later complicated by respiratory failure, sepsis, and multiorgan failure. He was managed in the ICU with Intravenous antibiotics, respiratory support with endotracheal Intubation and mechanical ventilation, Intravenous Immunoglobulin, and multiple organ support. The patient was taken off the ICU by the family for financial reasons and ultimately succumbed to the illness.**Clinical Discussion:** Tetanus, is a rare vaccine-preventable illness that is underreported. Spasms control and organ support is still the mainstay of treatment.**Conclusion:** Strict clinical vigilance is important for the early diagnosis and management of tetanus.

## 1. Introduction

Tetanus is a potentially fatal nervous system disorder characterized by muscle spasms that are caused by toxin-producing anaerobe *Clostridium tetani*. It can present in one of four clinical patterns: generalized, localized, cephalic, and neonatal. *Clostridium tetani* is an anaerobe found as spores in soil and in the gastrointestinal tracts of mammals. Tetanus spores enter the body through the skin breaks and germinate to produce a neurotoxin, tetanospasmin, which is responsible for the spasms associated with tetanus [1]. Tetanospasmin blocks the release of inhibitory neurotransmitters like GABA and glycine causing painful and violent muscle contraction [2]. Tetanus is diagnosed clinically when classic symptoms of muscle stiffness and contraction are coupled with a history of inadequate vaccination and recent trauma. Tetanus can also present without prior history of trauma [3]. We report a rare case of an elderly patient who developed tetanus following a penetrating injury in line with the SCARE guidelines [4].

## 2. Case report

A 76-year-old married farmer from a rural background presented to our ER by himself with a non-healing wound to the posterior part of his left thigh for 7 days, which he sustained after falling from a tree. There

was no significant medical or surgical history in the patient and his family, he did not take any drugs and had no known allergies. The patient didn't smoke but used alcohol regularly and was living an independent life with his wife. On examination, there was a 3 × 2 cm ulcerated suppurative wound over the posterior part of the left thigh. The wound was explored, debrided for suspicion of any foreign body, and dressed by the emergency physician on duty who also gave him a tetanus toxoid. On suspicion of an infected wound, a wound swab was sent for culture and sensitivity, and the patient was discharged on oral Flucloxacillin and Metronidazole and analgesics and advised to follow up in the outpatient department. The patient thought that the wound was not healing due to a foreign body retained inside the wound.

He sought help at a local medical center after the injury where the wound was cleaned thoroughly, and analgesics were given. There was a temporary relief of the pain, but it returned and progressively increased along with swelling and purulent discharge which led him to our center.

The next day, the patient presented to the ER as his pain was not relieved by analgesics. Investigation in the emergency showed increasing white blood cell count and the presence of pus cells in urine. He was discharged home on Ofloxacin in addition to the earlier antibiotics.

The patient presented again presented to the ER on the same day with slurring of speech and disorientation. On examination, he had

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board-like abdominal rigidity, muscle spasms, and *risus sardonicus*. These symptoms were easily induced by minor stimuli like noise, lights, and minor procedures like injections, suction, and catheterization. On neurological examination, bilateral plantar reflexes were down going but jaw reflex was found to be increased. On a strong suspicion of tetanus, the patient was admitted to the intensive care unit and was started on Intravenous Immunoglobulin (IVIG). Antibiotics were upgraded to Tazobactam-Piperacillin, Vancomycin, and Metronidazole.

Lumbar puncture was impossible due to a stiff back and a non-contrast CT head was normal. The patient was electively intubated in anticipation of airway obstruction from laryngeal and pharyngeal spasms. To control pain and spasms, the patient was sedated with fentanyl and midazolam. However, sedation alone was not sufficient to control spasms, so he was started on a neuromuscular blocking agent, Vecuronium via infusion pump. A blood culture sent on admission returned with the growth of *Clostridium tetani*.

The patient's renal function deteriorated over the next days, and he underwent 4 sessions of hemodialysis. Similarly, his hemoglobin dropped to 3 and he received five units of packed red cells. The patient's family was counseled about the course of illness and the required cost of treatment. Due to financial difficulties, the patient left the ICU against medical advice on the eighth day of admission and succumbed to the disease a day after discharge.

### 3. Discussion

Because of the universal vaccination of tetanus toxoid in resource-rich countries, the incidence of tetanus has dramatically reduced since 1940. Between 2009 and 2017, the United States Centers for Disease Control and Prevention reported a total of 264 cases of tetanus [5]. In contrast to resource-rich countries, tetanus remains endemic in resource-limited countries. An estimated 40,000–80,000 deaths occurred in the world due to tetanus in the year 2016 [6]. True disease incidence is unknown since it is not a notifiable disease in many countries.

The World Health Organization initiative on maternal and neonatal prevention has seen neonatal tetanus eliminated in 45 countries [7]. Also, cases of generalized tetanus in adults are very rare, even in developing countries, and are probably underreported. We diagnosed and initiated treatment based on the clinical features of the patient as early as possible.

Autonomic involvement is a characteristic feature of generalized tetanus that causes a rapid fluctuation in blood pressure and heart rate which can be challenging to manage [8]. Our patient was hypotensive and tachycardic and required continuous but variable dose inotropic support as the illness was complicated by sepsis from the infected wound and urinary tract infection. A study showed that the severity of symptoms is directly proportional to the incubation period of illness and the interval from the onset of symptoms to the appearance of spasms [9]. In our case patient developed spasms immediately after the appearance of other clinical symptoms, i.e., 7 days after injury, and our patient also had a deep penetrating wound that might have precipitated a severe illness.

Tetanus is strictly a clinical diagnosis. The growth of *Clostridium tetani* in wound culture is only a supportive feature as it can be present without tetanus [10]. Case fatality rates for non-neonatal tetanus in developing countries range from 5 to 50% [11,12]. However, the survival in tetanus patients is increased if they are treated in high facility intensive care units. Our patient was treated with the best available resources, but financial constraints made it difficult to stick to the most updated treatment methods at times.

In a similar case report, a 78-year-old person diagnosed with generalized tetanus recovered after 22 days of MICU stay [13]. Another case in Saudi Arabia survived after over 40 days of medical ICU stay after the patient was diagnosed with tetanus [14]. It is wise to counsel the patient party about a possible long ICU stay.

Optimal management guidelines for tetanus are lacking since it mainly occurs in a resource-poor setting where it is not very feasible to do clinical trials [15]. Current focus of management includes prevention of toxin uptake via the use of antibiotics and early wound dressing, control of muscle spasms, and supportive care. *Clostridium tetani* is sensitive to both metronidazole and penicillin [16]. Our patient was septic and developed multiple organ failures as the illness grew in severity, and we had to upgrade the antibiotics to cover for the hospital-acquired pathogens.

Spasms are what make tetanus such a fatal disease. Benzodiazepines are effective for that and in some cases, like ours, neuromuscular blocking agents are also required. In places with a lack of advanced critical care facilities, depriving the patient of sensory stimuli by isolating them in dark, silent rooms can be useful in decreasing the spasms [17].

Tetanus is a vaccine-preventable disease. The focus should be on regular booster vaccines for the general population to prevent tetanus. Management of tetanus should be done in the ICU setting and the high cost of ICU becomes a problem for financially disadvantaged people. The irony is that it is seen predominantly in resource-limited countries, possibly due to inadequate vaccination opportunities.

### 4. Conclusion

Though tetanus is rare in the modern-day, cases are still encountered especially in unvaccinated patients and in developing nations. A high degree of suspicion and strict vigilance, particularly in unimmunized patients is needed to diagnose the disease. Conservative management and spasms control, often for a longer duration and in the ICU can help the patients.

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#### Author contribution

Surendra Khanal and Shiva Pratik Sah and Sujata Dahal designed the study and the concept and prepared the manuscript. Bulbul Pradhan and Apurva Shrestha collected data and were involved in the management of the patient. All authors reviewed and approved the final manuscript.

#### Registration of research studies

N/a.

#### Guarantor

Shiva Pratik Sah.

#### Consent

Written informed consent was obtained from the patient's family for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

#### Provenance and peer review

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## Declaration of competing interest

None.

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