



## Case report

## Generalized tetanus in a landscaper without obvious wounds



Geetha Sivasubramanian

University of California, San Francisco, 155 N Fresno St, Suite 307, Fresno, CA 93701, United States

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## ABSTRACT

Tetanus is rare and potentially fatal infection in the US. Its incidence has declined dramatically over the years in developed countries due to robust immunization programs. We describe a case of generalized tetanus in a 66-year-old inadequately vaccinated landscaper who presented with classical symptoms but did not have any open wounds leading to delay in initial diagnosis but was successfully managed once the diagnosis was established.

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## Introduction

Tetanus is caused by the neurotoxin of the bacterium *Clostridium tetani* [1]. Universal vaccination programs and post exposure prophylaxis protocols have greatly reduced the incidence of tetanus in the US. Between 2001–2016, 459 non-neonatal tetanus cases were reported to the National Notifiable Diseases Surveillance System (NNDSS) and occurred almost exclusively among persons who are unvaccinated or inadequately vaccinated [2]. However due to the decline in incidence of tetanus, clinicians may have become more unfamiliar with its clinical presentation especially if it occurs in the absence of open wounds. Delay in diagnosis and effective management increases the mortality associated with this infection [3].

## Case report

A 66-year-old Hispanic gentleman with no past medical problems presented to an urgent care with 3 days of jaw pain, dysphagia and unable to eat or drink fluids. He was noted to have signs of mild dehydration and was initially thought to have possible parotitis. However, a week later he presented to Emergency room with progressive trismus, dysphagia as well as severe spasmodic back pain, bilateral hip pain and leg cramps. He was a landscaper by occupation and would work with soil and manure without wearing any gloves. He denied any open wounds. He never got any vaccinations after his teen years. His vitals showed a heart rate of 110 beats per minute, respiratory rate of 30 per minute and blood pressure of 120/80 mm oh Hg. There were no

open wounds, but he did have superficial scratches in his fingers and dirty fingernails. He was noted to have trismus, risus sardonicus and opisthotonus as well as board like rigidity of the abdomen. Initial labs and inflammatory markers were normal. A clinical diagnosis of generalized tetanus was made. He was given aggressive supportive care with intravenous benzodiazepine, neuromuscular blockade and placed on ventilator support. Antibiotic therapy with IV metronidazole was initiated and antitoxin with dose of 500 IU of Tetanus Immunoglobulin. He improved clinically with reduction in muscle spasms and over the course of next several weeks was successfully weaned off mechanical ventilation and neuromuscular blockers. He was eventually discharged to long term care facility and then home after short rehabilitation.

## Discussion

*Clostridium tetani* spores are present abundantly in the soil. Once the organism gains access to damaged human tissue, it can inoculate and turn into vegetative state. From the site of inoculation, the bacteria can spread to the spinal cord and brainstem via retrograde axonal transport [4]. It then secretes a neurotoxin called tetanospasmin into the synaptic cleft blocking neurotransmission across the synaptic cleft leading inhibition of modulation of anterior horn cells causing uncontrolled muscle contraction and spasms as well as autonomic instability [5]. The incubation period ranges from 3 to 21 days, averaging about 10 days. Generalized tetanus is the most common form and most common initial sign is spasm of the muscles of the jaw, trismus or “lockjaw” [6]. This is followed by painful spasms in other muscle groups in the neck, trunk, and extremities. The spasms of facial muscles give the classic “risus sardonicus” and the back

E-mail address: [gsivasubramanian@fresno.ucsf.edu](mailto:gsivasubramanian@fresno.ucsf.edu) (G. Sivasubramanian).

contraction leads to arching of back or opisthotonus [7]. In severe cases, the patients exhibit symptoms of autonomic overactivity such as sweating, tachycardia, arrhythmias, labile blood pressure, and fever [8]. Diagnosis is clinical. Tetanus should be in the differential diagnosis of trismus, especially if in patients who are inadequately vaccinated, or their vaccination history is unknown. Even though most cases present following a contaminated wound, sometimes there may be no obvious wounds and the spores may gain access through simple scrapes, as seen with our patient. Management includes 3 strategies: a. Reducing bacterial load to prevent further toxin production by debriding wounds and initiating metronidazole intravenous therapy; b. neutralizing any unbound toxins with tetanus immunoglobulin intramuscularly; c. controlling the effects of toxin bound to central nervous system with intravenous benzodiazepines, neuromuscular blockade, muscle relaxants [9]. Along with these strategies aggressive supportive care, ventilator management and treatment of autonomic disturbances are crucial. Prevention with vaccination remains the best strategy to control this deadly infection.

### Conclusions

Vaccination programs have largely reduced the incidence of tetanus. However, as clinicians we need to remain familiar with the presentation and management of this deadly infection. Our case illustrates that with gaps in immunizations, this deadly infection may still land at our doorstep when we least suspect it, such as without an obvious open wound source. Astute clinical diagnosis and prompt management with reducing bacterial load,

neutralizing unbound toxin and aggressive supportive care may be lifesaving.

### Declaration of Competing Interest

The authors report no declarations of interest.

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