Severe Generalized Tetanus: A Case Report and Literature Review

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Tetanus is a toxin-mediated disease produced by the bacterium Clostridium tetani characterized by generalized rigidity and muscle spasms that may cause respiratory arrest and death. Tetanus typically gains access to the body through apparent or unapparent wounds. Implementation of mandatory vaccination programs has successfully decreased the prevalence of this disease worldwide. We report a case of severe, generalized tetanus in a male patient who presented to the emergency department with dysphagia and back stiffness with no clear history of any trauma, except small subungual hematoma found on physical examination. The patient was admitted to the Intensive Care Unit, received the full supportive therapy for tetanus, and discharged home in good condition.

Key words: Clostridium tetani, tetanus, unapparent injury, vaccination

INTRODUCTION

The incidence of tetanus in developed countries has substantially decreased after the initiation of vaccination programs. However, mortality remains above 50% in patients over 60 years who are less likely to have been immunized. In Saudi Arabia, tetanus is considered almost eradicated after the implementation of aggressive vaccination programs and active immunization in hospitals for any wounded patient at risk. However, immigrants, the elderly, diabetics, and intravenous (IV) drug abusers are typical groups at high risk of developing tetanus due to inadequate immunization or repeated exposure to tetanus-prone wounds.

We report a case of tetanus in a 45-year-old Indonesian man who presented to the emergency department with dysphagia and back stiffness. The diagnosis of tetanus was a challenge in this case since there was no apparent port of entry for the organism, except small subungual hematoma found on physical examination. The patient was admitted to the Intensive Care Unit, received the full supportive therapy for tetanus, and discharged home in good condition.
On examination: He looked anxious, sweaty with stable vital signs apart from tachycardia and bouts of hypertensive episodes. The rest of his examination revealed extended stiff neck and partially opened mouth (locked jaw). Blackish discoloration under the right ring finger nail, subungal hematoma, was noticed. Upon questioning the patient about it, he remembered a minor trauma to his finger by a stone 1-week before while he was in Indonesia.

All of his investigations including cultures were unremarkable, except for anti-tetanus antibodies which were weakly positive, indicating inadequate immunization.

**Hospital course**

In the emergency department, the patient was given tetanus toxoid 0.5 ml intramuscular, metronidazole 500 mg started intravenously. Then the patient was moved to the Intensive Care Unit (ICU) for observation. In the ICU, tetanus immunoglobulin (TIG) 3000 IU was administered intramuscularly. Diazepam 10 mg intravenously every 6 h was added. After 6 days of ICU admission, the patient started to develop generalized spasticity, labile blood pressure, and heart rate. Respiratory compromise in terms of difficulty of breathing and low oxygen saturation eventually developed, and the decision was taken to intubate and mechanically ventilate. The patient was maintained on high doses of sedative agents: Midazolam, fentanyl IV infusion, followed by an infusion of cisatracurium, a paralytic agent, and baclofen as a muscle relaxant. Magnesium sulfate Infusion was also added to control his autonomic dysfunction. Tracheostomy was performed and he was kept on mechanical ventilation for almost 30 days before he was switched to pressure support. On day 40, mechanical ventilation was weaned off, sedation stopped, and physiotherapy started. The patient did well on 35% oxygen through tracheal mask. Two days later, his tracheotomy was decanulated, and the patient was eventually sent to the medical ward, where he spent 2 more days before being discharged home, fully ambulated for physiotherapy and follow-up.

**DISCUSSION**

It was a challenge to the emergency physician who thought about tetanus in a nondramatic presentation with a lack of history of an apparent injury.

Transmission of tetanus is primarily by contaminated wounds. Tetanus may also follow elective surgery, burns, deep puncture wounds, crush wounds, otitis media, dental infection, animal bites, abortion, and pregnancy. *Clostridium tetani* produces tetanospasmin, a neurotoxin that is responsible for all the clinical manifestations of tetanus when it reaches the peripheral nerves. Tetanospasmin prevents the release of the inhibitory neurotransmitters glycine and gamma-aminobutyric acid resulting in sympathetic overactivity.\(^2\)

Forms of tetanus are generalized, neonatal, Cephalic, and Local.\(^2\) The diagnosis is entirely clinical as in our case. The absence of other diagnoses in a patient without a clear history of adequate vaccination, and the presence of suggestive symptoms and signs make the clinical diagnosis of tetanus more likely.\(^3\)

The diagnosis of tetanus is purely clinical. There is no laboratory test to confirm it. The wound cultures are often negative with a yield of *C. tetani* in only 30% of the time. The serologic testing for antitetanus antibodies is, usually, done to look for inadequate vaccination which gives low or negative level. Unfortunately, tetanus can occur even in the presence of protective levels of antibodies. Therefore, serology can be used as supportive test if it is negative or poorly positive. However, it cannot be relied on to rule out the disease if it is strongly positive in highly suspicious cases.\(^3\)

Since tetanus is entirely clinical, we do not have a definition of a confirmed case. The Council of State and Territorial Epidemiologists published in 2009 the case definition of probable tetanus.

In the absence of a more likely diagnosis, an acute illness with muscle spasms or hypertonia and diagnosis of tetanus by a health care provider; or death, with tetanus listed on the death certificate as the cause of death, or a significant condition contributing to death.

The goals of treatment include: Prophylactic intubation in patients who are considered clinically to have moderate to severe symptoms. Stopping further toxin production by early source control, that is, surgical debridement, and neutralization of the unbound circulating toxin by administering TIGs are considered essential treatment steps in managing these patients.\(^4\) Antimicrobial therapy is needed, preferably Metronidazole 500 mg IV every 6 h. Metronidazole was found to decrease mortality in these cases.\(^5\) Control of muscle spasms is another important treatment goal with benzodiazepines and muscle relaxants. Intrathacal baclofen, a centrally acting muscle relaxant has been tested in previous studies and has shown good results, in terms of
weaning from the ventilator and decreasing the need for benzodiazepine.\textsuperscript{[6]} Management of autonomic storm using magnesium sulfate infusion.\textsuperscript{[7–8]}

**CONCLUSION**

Tetanus is a rare disease in Saudi Arabia where many physicians might not see a single case in their entire practice. This uncommonness together with subtle presentations of the disease can make its diagnosis a challenge for treating physicians.

Our case demonstrates that all physicians should get acquainted with the less dramatic presentations of tetanus without any apparent injury. Tetanus should be considered in every case of unexplained acute rigidity with no appropriate vaccination history. Despite available treatment options, tetanus still carries a high mortality. Early aggressive treatment and close monitoring might improve the outcome in this group of patients.

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