

## Tetanus, a current disease in pediatric population. Case report

### Tétanos, una enfermedad vigente en población pediátrica. Reporte de un caso

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#### Abstract

**Introduction:** Tetanus is an acute disease caused by a toxin produced by *Clostridium tetanii*. The disease can affect people of any age, and the fatality rate is high. Thanks to immunization the number of cases of the disease has decreased, although they are still present in isolation in countries with social and economic backwardness. **Objective:** To describe a case of a pediatric patient with generalized tetanus to reinforce the relevance of prophylaxis and early detection. **Case Report:** 6 years old female patient, with only one dose of pentavalent vaccine, 10 days after sharps injury by wood chips, starts with fever, muscle pain and generalized contractions, Tetanus was diagnosed by clinical symptoms and history. The management was based on the latest recommendations of the World Health Organization (WHO): Penicillin-Metronidazole antibiotic regimen, tetanus toxoid and tetanus high-dose gammaglobulin. After 2 years of follow-up under physiotherapy support, slight motor sequelae were observed. **Conclusion:** Tetanus is still presented in the pediatric population, associated with lack of vaccination. It is necessary to know the disease to provide proper diagnosis and management according to international lineaments.

#### Keywords:

Tetanus,  
opisthotonos,  
trismus,  
tetanus gamma  
globulin

## Introduction

Tetanus is an acute disease caused by a toxin produced by *Clostridium tetanii*, an obligate anaerobic bacillus, Gram positive, unencapsulated, heat, drying and disinfectant resistant, and spore-forming. The disease is produced by the excretion of a toxin, called tetanospasmin, which blocks inhibitory neurotransmitters of the central nervous system producing stiffness and muscle spasms, typical symptoms of tetanus<sup>1,2</sup>.

Globally, the real magnitude of the disease is unknown since the notification is incomplete. In 1997, according to WHO estimates, tetanus deaths reached 275,000, decreasing its rates until 2011, when they were reported 14,132 cases worldwide<sup>3</sup>.

In North and South America, 516 cases were reported in 2015, from which only 27 were reported in Mexico, 48 in Colombia, 273 in Brazil, 10 in Argentina, 14 in Venezuela, 17 in Honduras and 8 cases in Chile. In Mexico, the number of cases has decreased considerably per year after the implementation of the universal vaccination. According to epidemiological reports, from an average of 230 cases in the 1990s, the number decreases to 60 cases per year, from 2001 to 2010, presenting even less than 30 cases in the last 5 years<sup>3-5</sup>.

The disease can affect people of any age, with a high fatality rate (10-80%), even with modern and tecnologic intensive care.

There is no natural immunity against tetanus, thus, all the protection is obtained by vaccines containing inactivated tetanus toxin, or also the administration of an specific tetanus globulin<sup>5-7</sup>.

The incubation period may be between 3 and 21 days, with an average of bwteen 7 and 10 days, which depends on the distance of the injury from the CNS<sup>7,8</sup>.

Generalized or widespread tetanus is usually observed by the presence of trismus, being the first sign, as well as sardonic laughter, abdominal stiffness or epistonts and posterior dorsal stiffness, known as opisthotonos position, which cause serious problems of ventilatory mechanics, which can be mortal, even from the very first spasm<sup>9,10</sup>.

The objective of this report is to describe a clinical case of a pediatric patient with generalized tetanus, reinforcing the importance of vaccination and an early diagnosis.

## Clinical Case

A 6-year-old female patient with a low socioeconomic status, with an incomplete immunization schedule according to her age (only one dose of pentavalent vaccine and rotavirus had been applied). She began her clinical presentation 11 days prior to hospital admission, after having a sharp slice of wood on her right arm.

She went to the emergency department, where she was washed with antiseptic. Doctors gave the indication of domiciliary treatment based on dicloxacillin and paracetamol. Pain persisted in the place of injury, and after 10 days, she started a fever, abdominal muscle stiffness, trismus (sardonic laughter) and difficulty walking, because of her complete limitation to bend her both legs, thus, she went to the emergency department again.

The picture shows the progress during the following hours, with the appearance of opisthotonos (figure 1), initially without alteration of the vital signs nor the state of consciousness. Laboratory tests, cranial computed tomography (CT) and lumbar puncture were performed, all of them with normal results.

Hemoglobin 11.8 mg/dl Hematocrit 37.1% Leucocytes 7230, Neutrophils 4490, Lymphocytes 1730, Platelets 173000, Glucose 100 mg/dl, Urea 23 mg/dl, Creatinine 0.2 mg/dl, ALT 10 U/L AST 44 U/L, Calcium 9.8 mmol/L, Sodium 136 mmol/L, Potassium 4.1 mmol/L.

She was hospitalized in the Pediatric Intensive Care Unit (PICU) for neurological deterioration, being treated with ventilatory support, sedation, muscle relaxation, and with the administration of antibiotics (metronidazole and Penicillin). In the PICU, a wound was debrided in order to remove a 3cm long wood splint from the previous injury. Due to the clinical picture and her incomplete immunization schedule, generalized tetanus was suspected and a high dose of human immunoglobulin was intramuscular administered (500 IU), as well as one dose of tetanus toxoid.



**Figure 1.** Position of opisthotonos, characteristic of generalized tetanus.

The patient's evolution was torpid as she developed several complications, including: left pneumothorax, *Acinetobacter iwoffii* nosocomial pneumonia, left atrial endocarditis, and complex partial convulsive seizures.

Electroencephalogram reported right temporal paroxysmal discharge, and a new report of CT showed a subcortical cortical atrophy of frontal predominance. After the recovery of the infectious process, the patient was discharged with some neuromuscular compromise.

The monitoring was carried out by 2 years in external consultation with pediatrics, with medication and physical rehabilitation. After this period, the patient is asymptomatic and without evidence of neuromuscular sequelae, totally integrated to her school and social environment.

## Discussion

Tetanus is a serious, highly lethal and completely preventable disease<sup>1</sup>, still alive and present worldwide, with more than 10,000 cases reported in recent years. In Mexico, despite extensive vaccination campaigns, an average of 20 to 30 cases per year are reported, which occur mainly in people who have not been immunized or who have been partially immunized (lack of application of reinforcements)<sup>9</sup>.

It is highly important to apply improvements in vaccination strategies, since, according to WHO, the coverage reached an 86% in 2015. It has been shown that since the 1960s, with the introduction of the tetanus vaccine, the incidence rate worldwide has been significantly reduced<sup>3,5,6</sup>. In our clinical case, the lack of immunization was associated with low socioeconomic and cultural level, associated also to a house located in a remote area, with difficult access to health services.

The definition of tetanus according to WHO is based on the following clinical features: acute onset, hypertonia and/or painful muscular contractures (neck and jaw) and generalized spasms, with no other apparent medical cause. Although there is usually a history of injury, tetanus may also occur in patients who do not remember any injuries<sup>4,5</sup>.

The diagnosis of tetanus is strictly clinical, there is no laboratory test to confirm it, so in this case the diagnosis was suspected by the evolution of the clinical picture and the patient's history, mainly her incomplete immunization scheme and the wound in her right arm in a previous period, which was according to the incubation period of the disease<sup>4</sup>.

The evolution of the disease encompasses an average of two weeks; motor and neuropsychiatric sequelae are frequent in surviving patients<sup>3-6</sup>.

Currently, with airway treatments and ventilatory support, the disease is no longer an important cause

of death (although the autonomic dysfunction is the main cause of death in this type of patients)<sup>9</sup>. Regarding our clinical case, the sequelae were able to be remitted within two years after her hospital discharge.

Recently, anti-vaccination trends have been very common in some social sectors of some countries, so the disease has had increases in the annual incidence rates. It is important to publish the clinical cases, in order to increase awareness of the seriousness of the picture, decrease the resistance of the population to vaccination, to finally eradicate the disease.

## Conclusion

Tetanus is a severe and life-threatening disease that requires timely diagnosis and treatment. It is important to describe the disease in the study programs for medical personnel, as well as to increase strategies in order to fulfil the vaccination schemes and to finally eradicate the disease.

## Ethical Responsibilities

**Human Beings and animals protection:** Disclosure the authors state that the procedures were followed according to the Declaration of Helsinki and the World Medical Association regarding human experimentation developed for the medical community.

**Data confidentiality:** The authors state that they have followed the protocols of their Center and Local regulations on the publication of patient data.

**Rights to privacy and informed consent:** The authors have obtained the informed consent of the patients and/or subjects referred to in the article. This document is in the possession of the correspondence author.

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## Conflicts of Interest

Authors declare no conflict of interest regarding the present study.

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