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Case Report

Generalized Tetanus in an Unvaccinated Schoolgirl: Case Report

Ulises Alejandro Castañeda Peña[1]*, Ramírez Lara Marissa E[1], García Conde Carlos A[1], Rosas Alfonso Trinidad A[2] and Martínez Tovilla Yaneth[3]

[1]Pediatric Critical Medicine Resident Physician, Hospital for the Poblano Child, National Autonomous University of México, Puebla, México

[2]Doctor Assigned to the Pediatric Intensive Care Unit, Hospital for the Poblano Child, Puebla, México

[3]Department of Pediatrics at Benemérita Universidad Autónoma de Puebla/PRODEP Profile/Member of the Register of Researchers of the Benemérita Universidad Autónoma de Puebla/Academic Secretary of the State of Puebla Health University, Puebla, México

***Corresponding Author**: Ulises Alejandro Castañeda Peña, Pediatric Critical Medicine Resident Physician, Hospital for the Poblano Child, National Autonomous University of México, Puebla, México.

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Abstract

Below is a clinical case of severe generalized tetanus in a 10-year-old patient who did not receive vaccination. The objective of this case report is to provide scientific evidence that allows to generate awareness about the importance of vaccination for the prevention of *Clostridium* tetani infection. Case presentation: 10-year-old woman admitted to the Pediatric Intensive Care Unit (PICU) transferred from a second-level hospital; with a history of a penetrating lesion by wood splinter on the right foot, arriving 2 weeks after the injury and the presentation of the following symptoms prior to transfer to the Hospital for the Poblano Child: trismos, stiffness in the neck, trunk and extremities. Upon admission to our PICU patient in phase III of ventilation and under sedation, however, presented evident opisthotones. During their stay, lack of vaccination is identified, the clinical diagnosis is made and the treatment was multidisciplinary which included Infectology, Neurology, Rehabilitation and Nutrition. Patient with favorable evolution and leaves in good conditions with follow-up appointment to Neurology and Rehabilitation. Conclusions: vaccination is important for the prevention of tetanus; and multidisciplinary management brings good results.

Keywords: *Generalized Tetanus; Vaccination; Case Report*

Abbreviations

C. tetani: *Clostridium tetani*; PICU: Pediatric Intensive Care Unit; UI: International Units

Introduction

Tetanus is a disease caused by neurotoxins produced by *Clostridium tetani* (*C. tetani*); which has not been eradicated by the almost universal distribution of *C. tetani* spores that resist a hostile environment, so it remains a public health problem mainly in Africa and Asia. In Mexico the incidence is low, until epidemiological week 52 of 2021 20 cases of tetanus were reported [1-4]. Mortality without treatment is high, however, it has improved with intensive care units, with autonomic dysfunction being the main cause of death [2].

Clostridium tetani is a gram-positive tetanospasmin-producing *bacillus*, which causes excitatory neurotransmitters to predominate, increasing muscle tone and producing painful muscle spasms that are the cardinal symptoms of the disease [2,5-8].

The objective of this report is to provide evidence of a case of severe generalized tetanus because of the lack of vaccination, we present the aspects of its clinical evolution, treatment and recovery; emphasizing to raise awareness about the importance of vaccination for the prevention of the disease.

Presentation of the Case

A 10-year-old woman from Chiautla, Puebla, México; primary schooling; he was admitted to the intensive care of the Hospital for the Poblano Child on 16/03/22. With a history of being the daughter of anti-vaccine parents, without any immunization and with a puncture wound in the plantar region of the right foot 7 days prior to the onset of symptoms.

It began on March 9, 2022 with poorly referred abdominal pain, without other symptoms; 24 hours later chest pain and muscle spasms of the trunk and neck are added, in addition to trismos (Image 1). After 3 days of evolution he was admitted to a second-level hospital, irritable, with hyperalgesia in extremities and trunk, spastic jaw and sialorrhea. After 4 days of evolution, he suffered neurological deterioration, decreased respiratory effort, cyanosis and laryngeal stridor. It was decided to move to phase III ventilation.

Image 1

Upon admission to the Hospital for the Poblano Child, violent muscle spasms were observed that were exacerbated with any tactile, luminous, and sound stimulation, presented a typical position in opisthotones (Image 2). Contraction of the facial muscles and the four limbs and in the plantar region of the right foot scar with perilesional induration of approximately 1.5 cm was observed. Laboratory studies (blood biometry, serum electrolytes, coagulation times, liver function tests and lumbar puncture) and cabinet studies (magnetic resonance imaging, chest x-ray, electroencephalogram) showed no alterations suggestive of neuroinfection, spinal cord injury or other pathology.

Image 2

The diagnosis of generalized tetanus was integrated by clinical characteristics and classified as a grade 4 of Ablett, general measures were initiated; sedation with midazolam, analgesia with morphine, neuromuscular blockade with vecuronium, infusion of lidocaine and magnesium sulfate. A dose of tetanus immunoglobulin 250 IU and antibiotic treatment for 10 days with Metronidazole were administered.

At 19 days of stay in THE PICU, sedation and neuromuscular blockers were suspended without recurrence of symptoms, achieving extubation after 27 days, leaving home at 50 days, awake, conscious, oriented, wandering with help (Image 3).

Image 3

Discussion

The incidence of tetanus in México has increased in recent years due to the anti-vaccine movement, which emerged after the research of Wakefield., *et al*. published in 1998 in the journal *Lancet,* however, it was considered one of the largest scientific frauds in history. In our country the movement has not been registered, but there are minorities who support this trend, as in the case of the parents of our patient [9].

The diagnosis of tetanus is made based on clinical findings, related to uncontrolled muscle contraction, which is characterized mainly by generalized and intentional muscle spasms, trisms, sardonic laughter, opisthotones and dysautonomias. Generalized tetanus accounts for about 80% of cases [2,6,8,10-14]. In our patient, the characteristic clinical signs of generalized tetanus and the development of dysautonomia's could be demonstrated, presenting wide variations in heart rate and blood pressure.

The characteristics depend on the severity of the condition and include from jaw blocked by masseter muscle involvement, the affection of the facial muscles that causes sardonic laughter, the contraction of abdominal muscles causes painful abdominal stiffness, more severe spasms cause retracted neck, bent elbows, bent knees, dorsiflexion of the feet; if the spinal erectors are affected, arching of the back or

opisthotones is observed [2,8,10]. The Ablett classification is used to determine severity. In this case it was classified as a grade 4 of generalized tetanus due to the presence of dysautonomies [2,11].

The treatment is life support, we can divide it into general measures, aimed at reducing visual, auditory, and tactile stimuli; neutralization of the toxin with the administration of anti-tetanus immune gamma globulin; inhibition of toxin production with specific antimicrobial treatment; pain management; and the entry site, as well as management of dysautonomies. Magnesium sulfate with a good response associated with diazepam and dexmedetomidine has been used to improve the control of dysautonomies and reduce the time spent in hospital [15,16]. In this case, the clinical diagnosis was made upon admission to our hospital unit allowing the start of specific treatment in accordance with international guidelines, anti-tetanus gamma globulin was administered within 12 hours after admission; antibiotic treatment with metronidazole, neuromuscular blockers, benzodiazepines, magnesium sulfate and dexmedetomidine was initiated. The time of endotracheal intubation was like that reported in other case series [17].

In this disease prevention is the most important thing since it is impossible to eliminate the spores, vaccination is the most effective way to reduce the incidence of its presentation, the immunity conferred by a vaccinated mother lasts up to 5 months of extrauterine life approximately and natural infection does not confer subsequent protection. In México, a schedule of 4 doses of hexavalent vaccine is applied between 2 and 18 months of age, DPT booster at 4 years and prophylaxis with Td and tetanus immunoglobulin according to the vaccination history in people with wounds. Prophylaxis with these vaccines reports an efficacy close to 100% with complete schedules [18].

Conclusion

Tetanus is an entity that, although it is uncommon at this time, when it occurs with a high morbidity and mortality and high clinical suspicion must be had to be able to address it in a comprehensive way. The main risk factor is the absence of vaccination, so it is important to comply with the national vaccination schedule. Early diagnosis and multidisciplinary management, nutritional support from admission and the timely start of rehabilitation is a pillar to improve the outcome and prognosis of these patients.

Conflict of Interest

The authors declare that they do not present conflicts of interest in relation to the preparation and publication of this article.

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