Journal of Neurological Research and Therapy

Open Access - Peer-Reviewed - ISSN 2470-5020

Portico Archived | Crossref DOI | CC BY 4.0 Licensed

Case Report

A Meningeal Syndrome Revealing A Tetanus in A Togolese: Case Report and Review of the Literature

AGBA Léhleng [1,*], ANAYO K Nyinèvi [2], DJALOGUE Lihanimpo [3], GUINHOUYA K Mensah [2], AWIDINA-AMA Awissoba [4], APETSE Kossivi [4], KUMAKO V. Kodzo [1], KOMBATE Damelan [4], BELO Mofou [2], BALOGOU K Agnon [4]

[1] Neurology Department, University Hospital Center of Kara, Kara University, PoBox 18 Kara (Togo)

[2] Neurology Department, University Hospital Center of Sylvanus Olympio, Lomé University, PoBox 57 Lomé (Togo)

[3] Internal Medicine Department, University Hospital Center of Kara, Kara University, PoBox 18 Kara (Togo)

[4] Neurology Department, University Hospital Center of Campus, Lomé University, PoBox 57 Lomé (Togo)

[*] corresponding author

*** Correspondence:** AGBA Léhleng. Neurology Department, University Hospital Center of Kara, Kara University, Kara – Togo

Published citation: AGBA Léhleng, ANAYO K Nyinèvi, DJALOGUE Lihanimpo, GUINHOUYA K Mensah, AWIDINA-AMA Awissoba et al. (2019) **A Meningeal Syndrome Revealing A Tetanus in A Togolese: Case Report and Review of the Literature**. *Journal of Neurological Research and Therapy* - 3(1):29-34. https://doi.org/10.14302/issn.2470-5020.jnrt-19-2983

Article DOI: 10.14302/issn.2470-5020.jnrt-19-2983

Abstract

Although it is a vaccine-preventable disease, tetanus is frequently found in sub-Saharan Africa. Because of its rarity, this disease poses two problems for doctors of the 21st century: to make early diagnosis in order to refer patients to appropriate care structures, and to continue to ensure correct prevention of an affection that few current doctors have met. In its generalized form, the diagnosis of tetanus is easy, but when the beginning is localized, tetanus can be changed with other diseases leading to a diagnostic wandering and a delay of adequate management. We report a case of tetanus in an 18-year-old male, who was received for neck pain and stiffness of the neck with a positive Kernig sign associated to fever for 48 hours. Initially treated for meningitis, the patient will develop at day 3 of hospitalization the signs of generalized tetanus which led to evoked the diagnosis of tetanus. This diagnosis was reinforced by the notion of a rusty nail injury to the soles of the right foot 3 weeks before hospitalization and the absence of anti-tetanus vaccination. After using tetanus serum and vaccination with antibiotics (Metronidazole and Penicillin) and Diazepam in association with stripping of the wound under the foot, the patient was improved. This case illustrates that any neurological sign with the first trismus must evoke until

proof of the contrary, a tetanus especially in case of association with a wound even if the immunization schedule is up to date.

Keywords:
Meningeal syndrome; tetanus; trismus; Subsaharan Africa

Article Information	
Academic Editor	Pengcheng Han, Dignity Health St Joseph Hospital and Medical Center, United States.
Received Date	27 July 2019
Accepted Date	23 August 2019
Published Date	26 August 2019
Online	26 August 2019
Publication	Volume 3; Issue 1; Pages 29–34
Copyright	© 2019 AGBA Léhleng, et al.
License	This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited. https://creativecommons.org/licenses/by/4.0/

Introduction

Although it is a vaccine-preventable disease, tetanus is frequently found in sub-Saharan Africa [1]. It is an infectious disease caused by tetanospasmin, produced by Clostridium tetani. This toxin secreted from a wound contaminated by this ubiquitous bacillus, once migrated to the level of the anterior horns of the spinal cord and cerebellum, an increase in muscle tone [2]. Because of its rarity, this disease poses two problems for doctors of the 21st century: to make early diagnosis in order to refer patients to appropriate care structures, and to continue to ensure correct prevention of an affection that few current doctors have met [3]. When tetanus presents itself in generalized form, its diagnosis is easy. However, localized beginnings can change with other diseases leading to a diagnostic wandering and a delay of adequate management. We report a case of tetanus whose onset mimicked meningitis, and in this case we will review the literature of this rare but potentially life-threatening condition. Written informed consent was obtained from the patient for publication of this case report.

Case Presentation

An 18-year-old male was received on January 15, 2019 for neck pain and stiffness of the neck, associated with fever for 48 hours. The symptoms began on January 13, 2019, prompting a consultation at the health center of the prefecture where a lumbar puncture was performed in front of the suspicion of meningitis. Examination of cerebrospinal fluid (CSF) showed pleocytosis, normal glycorrhachia and slight high of proteins (0.60 mg / l). These results conducted to suspect a viral meningitis then the patient was referred to Teaching Hospital Center of Kara, 48 hours later. In his medical story before this hospitalization, he has no known personal or family disease; he has never been hospitalized or operated. He is a single childless who certifies that he has never been vaccinated against tetanus. He does not take any neuroleptic treatment. On initial evaluation, he was febrile with 38°2C of temperature, but hemodynamically stable. The neurological examination noted a meningeal syndrome with neck stiffness and a positive Kernig sign. There was neither photophobia, nor phonophobia. There was no vomiting or nausea. The patient had no neuropsychological disorder or sensorimotor deficit. The examination of the cranial nerves was normal. On examination of the other apparatus, there was a pulmonary condensation syndrome, a regular tachycardia at 104 beats per minute without signs of heart failure. Examination of the oral cavity and the ENT (ear, nose, and throat) sphere was normal.

The following ancillary examinations were performed: complete blood count, C-Reactive protein, and sedimentation rate were normal; X-ray of the chest showed some basal alveolar opacities on the right; HIV serology was negative. Examination of the CSF showed pleocytosis with still the slight high protein at 0.57 g/l and normal glucorrachia; the search for Mycobacterium tuberculosis in CSF by Protein Chain Reaction was negative. On the basis of the results of the additional examinations, the diagnosis of decapitated meningitis was retained and antibiotic therapy was initiated. At day 3 of hospitalization, an apyrexia was obtained but the patient reported thoracic pain occurring in a burst in the form of oppression and one could note a severe hyperextension of the neck with complete impossibility of any cervical movement. The patient presented with hypersudation and during any change of position a generalized muscular contracture appeared showing an attitude in opisthotonos. The opening of the mouth was possible and there was no dysphagia but a trismus appeared fleetingly. Consciousness was always preserved. These new signs supported the diagnosis of a generalized tetanus in the state phase. This diagnosis was reinforced by the notion of a rusty nail injury to the soles of the right foot 3 weeks before hospitalization and the absence of anti-tetanus vaccination. This wound had been treated by self-medication with an anti-inflammatory ointment. The patient was classified as stage 2 of Mollaret and had 2/6 according to the classification of Dakar (1975). The treatment was modified by administering 3 million Penicillin G and 500 mg parenteral Metronidazole every 12 hours, diazepam 20 mg every 4 hours. The punctate wound under the foot was stripped and the patient received anti-tetanus serum and a dose of tetanus toxoid vaccine. Sufficient water intake has been done to prevent dehydration. The paroxysms of contractures regressed and the complete mobilization of the neck was possible on day 18 of hospitalization. The patient is released without sequelae after 25 days of hospitalization with a well-established vaccination schedule.

Discussion

Tetanus is described as "a disease of the nervous system characterized by permanent muscle contractures, with brief but violent exacerbations" [4]. It is an infectious disease that remains a major public health issue in developing countries despite the existence of an effective, available and integrated vaccine in the Expanded Program on Immunization (EPI) [5]. In fact, tetanus affects 0.7 to 1 million people / year worldwide, with a mortality rate of between 11 and 50% in adults [6]. In 2013, 12 cases were reported in Morocco, one in Tunisia, 264 in Egypt, 20 in Romania, 9 in France and Spain, 36 in the United States and 2 in Canada [7]. This incidence can be explained by the generalization of vaccination and its ten-year recalls throughout life [8]. Clostridium tetani, a cause of tetanus, is a gram-positive, obligate anaerobic bacillus that produces spores that provide high resistance to desiccation and heat. Its normal habitat is "the earth" [9]. It penetrates the body in favor of a solution of continuity of the skin or mucous membranes. Tetanospamine produced by Clostridium tetani is responsible for irreversible disinhibition of neuromuscular transmission. The consequence in striated muscles is permanent hypertonia, interspersed with spasms [4]. The diagnosis of tetanus is clinical and should be considered after the first symptoms, especially if these symptoms occur after an injury, or in someone whose vaccine status is defective. The main mode of contamination in third world countries differs greatly from that of industrialized countries: in the latter, injuries are related to domestic activities or gardening, while in developing countries, injuries result from contempt or lack of knowledge of the basic rules of asepsis, particularly as a result of neglected foot injuries or certain traditional practices (piercings, scarifications or tattoos) [10,11]. This was the case of our patient who had a foot sore caused by a rusty nail. In addition, the notion of misunderstanding of the basic rules of asepsis is reinforced at home by the poor management of the wound with an anti-inflammatory ointment. The site of entry can also be gynecological in sub-Saharan Africa (deliveries and abortions) [12]. Finally, intravenous drug users are an at-risk group that should not be overlooked as it accounts for up to 15% of tetanus patients in the United States [13]. After 4 to 14 days of incubation on average, the first clinical sign is almost always a trismus: a permanent, invincible and painful contracture of masseter muscles. More or less obvious, the trismus can be quickly associated to facial muscle contracture resulting in a “sardonic facies”, thorny to describe, but quickly obvious for those who saw some tetanus, as well as a stiffness of the neck. There is no fever, no disturbance of consciousness. The diagnosis of tetanus is at this stage based on these only minimal signs [4]. Our patient also presented a trismus occurring fleetingly. But this sign was not put on the account of a tetanus especially since the notion of wound was not yet

known at his admission. However, the neck pain and the infectious syndrome of our patient evoked in the beginning a meningitis thus causing a delayed diagnosis. Anna Moniuszko [14] in Poland in 2015, reported the case of a 75-year-old woman who had previously been vaccinated against tetanus, who was suspected of having meningitis in front of headaches, photophonophobia, neck stiffness, trismus and fever. Therefore, any trismus should be considered as of tetanus origin until proven otherwise because any misdiagnosis can be fatal for the patient. In unlikely cases, the diagnosis is confirmed by the sign of the tongue depressor described by Armengaud [15]. Although the generalized form of tetanus is the most common, there are other clinical forms that are also sources of diagnostic error. It is cephalic tetanus of Rose which associates a facial contracture with peripheral facial paralysis on the side of the entrance door [16]. It can generalize secondarily. Ophthalmoplegic tetanus of Worms follows an eyelid sore or orbit and is manifested by ocular nerves palsy affecting mainly the third cranial nerve [4]. Tsuchiya reported in 2018 in Japan a case of localized tetanus in the form of spastic paraparesis erroneously evoking myelitis. This patient of 35 years presented no trismus or opisthotonos at the beginning. It was on the eleventh day that the appearance of an opisthotonos helped to correct the diagnosis [17]. The main differential diagnoses to be eliminated in front of a trismus are a local cause (dental abscess or amygdala, maxillary trauma, maxillary arthritis); acute muscular dystonia caused by certain drugs (neuroleptics, metoclopramide, metopimazine more rarely) [4]. No ancillary examination is essential in the diagnosis of suspected tetanus [4] and the progressive prognosis depends on the severity of the disease. Several classifications have been proposed and those of Mollaret and Dakar are the most used. The latter make it possible to classify tetanus in three groups of increasing gravity [18]. Our patient belonged to group 2 of each of these two classifications and therefore had a good evolutionary prognosis. The interest of therapeutic management of tetanus in intensive care is still relevant. The absence of specific treatment, once the tetanus toxin is fixed on the nerve centers, makes the treatment of tetanus essentially symptomatic, requiring the use of technics of reanimation to treat the respiratory and cardiovascular failures [19]. Symptomatic treatment should be initiated in the intensive care unit (ICU). Strict sensory isolation is no longer mandatory given the use of sedatives [20]. A central venous catheter is placed to meet the fluid and nutritional needs of the patient during his ICU stay. A urinary catheter is often put in place to avoid causing distention of the bladder. Nutritional intake is a prerequisite in patients with tetanus, to prevent the development of immune deficiency, which would increase the risk of acquiring a nosocomial infection [21]. Finally, physical therapies, motor physiotherapy and thoracic therapy, should be initiated as soon as possible to prevent the development of para-osteo arthropathies that may compromise or even worsen the future functional prognosis [22]. Finally, physical therapies, motor physiotherapy and thoracic therapy, should be initiated as soon as possible to prevent the development of para-osteo arthropathies that may compromise or even worsen the future functional prognosis [22]. Disinfection of the entry site, when found, with saline and iodinated polyvidone or chlorinexidine should be part of the therapeutic algorithm [23]. The use of antibiotics, although highly controversial, is still recommended for treating severe forms of tetanus. Specifically, that of penicillin G at 4 to 10 million units per day, although the use of metronidazole 500 mg per 5 hours for a period of 7 to 10 days has significantly improved the survival rate (7% versus 24% in the penicillin group) [24]. The use of tetanus serum is essential in cases of severe tetanus. A dose of 250 IU was administered subcutaneously or intramuscularly. This dose may be increased to 500 IU if the wound is infected or older than 24 hours and in patients weighing more than 80 kg [25,26]. This serum quickly neutralizes tetanus toxin, providing fast and effective protection against tetanus. On the other hand, the vaccine provides long-term protection (from 1 to 14 days) through an active vaccination process. The action of tetanus serum is rapid (detection of serum peaks 2 to 3 days after injection) and lasts an average of 3 weeks [27]. Our patient received the different aspects of this therapeutic protocol but did not need intubation because of his clinical condition. Despite well-conducted treatment, patients with severe tetanus may be at risk for life-threatening complications. Nosocomial infections topped the list of complications, particularly pulmonary infections [28,29]. Neurovegetative disorders are the second most common complications [29]. In 2011, the mortality rate was 47.8% in France [30], 35.7% in Poland [31]. Houari, in 2017, in Morocco found a mortality rate of 55% [8]. Death can be attributed directly to tetanus, through various neurovegetative disorders that it generates, or indirectly, following complications including nosocomial infections with first respiratory infections [32]. The clinical course of our patient was favorable under the treatment he received. The treatment of tetanus is mainly preventive. It

relies mainly on identifying at-risk wounds and verifying the patient's immunization status. The rapid tetanus test is an immunochromatographic, unitary, simple, rapid and reliable test for the detection of tetanus-specific antibodies. It allows the specific targeting of unprotected persons requiring serotherapy. It has a high sensitivity and specificity of 83% and 97.5% respectively [33]. As this test is not available in Togo, vaccination in principle of people who do not know their immunization status should be a rule.

Conclusion

Since tetanus has become increasingly rare in adults, it tends to be forgotten in diagnoses and is therefore only obvious in the case of complications. Any neurological sign with the first trismus must evoke until proof of the contrary, a tetanus especially in case of association with a wound even if the immunization schedule is up to date.

Competing Interests

The authors have declared that no competing interests exist.

References

1. Aziz R, Colombe S, Mwakisambwe G, Ndezi S, Todd J, Kalluvya S, Mangat H S, Magleby R, Koebler A, Kenemo B, Peck R N. Pre-post effects of a tetanus care protocol implementation in a sub-Saharan African intensive care unit. *PLoS Negl Trop Dis*, 12 (8): e0006667. https://doi.org/10.1371/journal.pntd.0006667
2. Schweiz. Le tétanos en Suisse de 1974 à 2007. *Bulletin / Office fédéral de la santé publique.* 2009; 41: 761-765
3. Sanford JP. Tetanus: forgotten but not gone. *N Engl J Med* 1995; 332: 812-813. https://doi.org/10.1056/nejm199503233321209
4. Trémolières F. Tétanos. *Encycl Méd Chir. AKOS Encyclopédie Pratique de Médecine*, 4-1180, 1999, 4p
5. Manga NM, Dia NM, Ndour CT, Diop SA, Fortes L, Mbaye M, Diop BM, Sow PS. Tétanos néonatal et de la femme en âge de procréer à la clinique des maladies infectieuses de Dakar. *Médecine et maladies infectieuses.* 2009 Dec;39(12):901-5. Pub Med. https://doi.org/10.1016/j.medmal.2008.10.011
6. Mallick I.H. and Winslet M.C. A review of the epidemiology, pathogenesis and management of Tetanus. *International Journal of Surgery.* 2004; 2: 109–112. https://doi.org/10.1016/s1743-9191(06)60056-3
7. *Statistiques sanitaires mondiales de 2013*. Organisation Mondiale de la Santé. OMS. 2013.
8. Houari N., Benjira R., Laamarti H. Severe tetanus in intensive care unit: about 20 cases. *Journal of Medical and Surgical Research.* 2017; 4 (3): 483-9.
9. Kouzmitcheva A, Charlai I, *Maladies infectieuses infantiles*. Edition Mir Moscou. 1989 ; 373-7
10. Bonsignour J.P, Rousseau J.M. Tetanus. Physiopathology, diagnosis, prevention. *Revue pratique* 1996 Feb15, 46 (4) : 479-85.
11. David Tranvan. *Réanimation du tétanos grave de l'adulte à DAKAR* ; Thèse en médecine, Bordeaux ; 2000 n°19.
12. Gentilini M. Tétanos. *Médecine tropicale*. Paris : Flammarion ed, 1993 (médecine-sciences) : 369-72.
13. Talan DA, Abrahamian FM, Moran GJ, Mower WR, Alagappan K, Tiffany BR, Pollack CV Jr, Steele MT, Dunbar LM, Bajani MD, Weyant RS, Ostroff SM. Tetanus immunity and physician compliance with tetanus prophylaxis practices among emergency department patients presenting with wounds. *Ann Emerg Med.* 2004; 43 (3) :305-14. https://doi.org/10.1016/j.annemergmed.2003.09.017
14. Moniuszko A, Zajkowska A, Tumiel E. Meningitis, clinical presentation of tetanus. *Case Rep Infect Dis.* 2015; 2015: 372375. Published online 2015 Feb 18. doi: https://doi.org/10.1155/2015/372375
15. Pichard E, Beytout J, Delmont J, Marchon B. *Malin Trop Afrique*, Paris 2002 : 589 p.
16. Popoff MR, Poulain B. Tétanos : physiopathologie, épidémiologie, formes cliniques, Traitements et vaccination. *Antibiotiques.* 2005 ; 7 : 23-41. https://doi.org/10.1016/s1294-5501(05)80163-3

17. Tsuchiya M, Kobayashi F, Yamashiro N. A case of local tetanus presenting spastic paraplegia mimicking myelitis. Rinsho Shinkeigaku. 2018 Nov28,Epub 2018 Oct27 58(11):688-91. https://doi.org/10.5692/clinicalneurol.cn-001196
18. Beytout J, Delmont J, Marchou B, Pichard E. *Manuel de maladies infectieuses pour l'Afrique*. Edition John Libbey Eurotext, Paris 2002, p : 393-401
19. Berton C., Kempt J. Conduite pratique de la réanimation du tétanos de l'adulte. *Encycl Méd Chir* 1994, Anesthésie-réanimation. Tome 5.36-984-A-70.
20. Grosbuis S., Goulon M. The treatment of tetanus. *Revue pratique* 1998 Mar 1, 48(5) : 478-81.
21. Linton Dm., Wells Y., Potgieter Pd. Metabolic requirements in tetanus. *Crit Care Med* 1992; 20:950-952. https://doi.org/10.1097/00003246-199207000-00009
22. Koulla-Shiro S., Kouda-Zeh A., Guemne A. Tétanos de l'adulte à Yaoundé : étude épidémiologique. *Med Mal Inf.* 1994, 24 :67-69. https://doi.org/10.1016/s0399-077x(05)80208-2
23. Gilles P ; Prise en charge des plaies aux urgences. Société Francophone de médecine d'Urgence. *Conférence de Consensus*. 2005 ; 12 : 1-22.
24. Ergonul O, Egeli D, Kahyaoglu B, Bahar M, Etienne, M, Bleck T. An unexpected tetanus case. *The Lancet Infectious Diseases.* 2016 ; 16 (6) : 746-752. https://doi.org/10.1016/s1473-3099(16)00075-x
25. Antona D. Le tétanos en France en 2000. *Surveillance Nationale des Maladies Infectieuses*, Institut de veille Sanitaire. 2003 ; 109-112.
26. Rutschmann O. Prophylaxie antitétanique aux urgences. *Urgences.* 2004 ; 31 : 415-424.
27. Zidani S. Thèse de médecine intitulée « *La sérovaccination anti-tétanique : Evaluation des pratiques au service d'accueil des urgences du Chu Ibn Rochd de Casablanca: Etude prospective à propos de 700 cas* », présentée et soutenue publiquement en 2006 à la faculté de médecine et de pharmacie de Casablanca.
28. Ribereau-Gayon R. Le traitement du tétanos en zone rurale d'Afrique de l'Est (RD. Congo - Zaïre) : Evaluation d'un protocole thérapeutique à propos de 21 cas. *Med Afr Noire.* 2000 ; 47: 132-5.
29. Derbie A, Amdu A, Alamneh A, Tadege A, Solomon A, Elfu B, Biadglegne F. Clinical profile of tetanus patients attended at Felege Hiwot Referral Hospital, Northwest Ethiopia: a retrospective cross sectional study. *Springerplus* 2016, 5(1): 892. doi: https://doi.org/10.1186/s40064-016-2592-8. eCollection 2016.
30. Denise Antona Le tétanos en France entre 2008 et 2011. Le bulletin épidémiologique hebdomadaire BEH26/26. 2012:303-306
31. Zieliński A, Rudowska J. Tetanus in Poland in 2011. *Przeglad epidemiologiczny* 2012; 67(2): 253-4.
32. Chakir S. Thèse de médecine intitulée « *Mortalité du tétanos grave en réanimation* » présentée et soutenue publiquement en 2006 à la faculté de médecine et de pharmacie de Casablanca.
33. Bourée P, Bisaro F, Delaigue S. Intérêt du test rapide dans le diagnostic du tétanos. *Option/Bio* 2010 ; 21(436) : 16-17. https://doi.org/10.1016/s0992-5945(10)70455-4

Publisher's Note

All claims, opinions, data, and conclusions expressed in this article are solely those of the author(s) and contributor(s), and do not necessarily represent those of Open Access Pub, the journal, its editors, or reviewers. Open Access Pub does not guarantee or endorse any product, method, instruction, or claim discussed in the article, and disclaims responsibility for any injury to people or property resulting from ideas, methods, instructions, or products referred to in the content.