

# PERSISTENT PYREXIA IN TETANUS: A CASE REPORT FROM NEPAL

Bikash Khadka<sup>1\*</sup>, Kishor Khanal<sup>2</sup>, Nisha Sharma<sup>3</sup>

## Affiliation

1. Consultant / Department of anesthesiology and critical care, Nepal Medcity, Nepal
2. Consultant / Department of anesthesiology and critical care, Nepal Medcity.
3. MBBS Doctor, KIST Medical College and Teaching Hospital, Nepal

## ARTICLE INFO

Received : 07 July, 2022

Accepted : 03 December, 2022

Published : 27 February, 2023

© Authors retain copyright and grant the journal right of first publication with the work simultaneously licensed under Creative Commons Attribution License CC - BY 4.0 that allows others to share the work with an acknowledgment of the work's authorship and initial publication in this journal.



CR 51

DOI: <https://doi.org/10.3126/bjhs.v7i3.52774>

## Corresponding Author

Dr. Bikash Khadka

Consultant

Department of Anesthesiology and Critical Care

Email : [khadka.vkas@gmail.com](mailto:khadka.vkas@gmail.com)

ORCID ID: <https://orcid.org/0000-0002-4114-8285>

## Citation

Bikash Khadka, Kishor Khanal, Nisha Sharma. Persistent pyrexia in tetanus: a case report from Nepal. BJHS 2022;7(3)19. 1919 - 1921.

## ABSTRACT

Tetanus, an infection caused by the gram-positive, obligate anaerobic bacillus *Clostridium tetani*, is still prevalent in developing countries. Fever is an unusual symptom in tetanus. The disease must be managed by preventing tetanospasmin absorption, treating symptoms, stabilizing autonomic instability, using antibiotics, and controlling the airway with assisted ventilation if necessary. We present a case report of a tetanus patient who had persistent pyrexia despite ruling out all the obvious causes of fever, that coincide with the persistence of muscle spasms and/or use of prolonged duration of benzodiazepines.

## KEYWORDS

*clostridium tetani; diazepam; Nepal; pyrexia; spasm*



## INTRODUCTION

Tetanus, caused by a gram positive, obligate anaerobic bacillus *Clostridium tetani*, continues to be a problem in developing countries like Nepal. One of the reasons could be because of the stable terminal spore formed by *Clostridium tetani* which is ubiquitous in nature and is found in the soil, intestines and feces of domestic animals and humans. However, they are non-invasive and inoculation usually requires the disruption of the skin barrier by a foreign body.<sup>1</sup> The time between inoculation and clinical manifestation varies, reflecting the distance required for the toxin to ascend and interact with the central nervous system.<sup>2</sup> Clinical symptoms usually occur from 7 to 14 days after inoculation, although cases have also occurred almost 2 months after the injury.<sup>3</sup> It usually begins with localized symptoms such as muscle spasms, trismus, and dysphagia before progressing to systemic symptoms such as respiratory failure and opisthotonus. *Clostridium tetani* secretes two toxins: tetanospasmin and tetanolysin. The toxin tetanospasmin causes muscle spasms and trismus even if the organism is still in its immediate environment.<sup>4,5</sup> This is because the toxin travels to the neuromuscular junction through intra-axonal transport in the CNS.

One of the most serious complications is overactivity of the autonomic nervous system.<sup>6,7</sup> It is thought to be the result of central nervous system lesions caused by intraseasonal retrograde tetanospasmin transport<sup>7,8</sup>, though some authors argue that autonomic hyperactivity is more likely the result of impaired inhibitory transmission.<sup>9</sup> Patients with trismus and muscle spasms suggestive of tetanus should be evaluated for dystonia, strychnine poisoning, tooth infection, seizure activity, or hypocalcemic tetany.<sup>10</sup>

To manage the disease, keep tetanospasmin from being absorbed, treat symptoms, stabilize autonomic instability, give antibiotics, and, if necessary, keep the airway open with assisted ventilation. We present an interesting case who presented with fever that persisted despite standard care in ICU.

## CASE DETAILS

A 65-year-old farmer presented to the emergency department of our center from another facility with a complaint of difficulty opening the mouth and dysphagia for solid and liquid food for 2 days. He sustained a cut injury to the left great toe 14 days ago while working in the field. Primary care had been given at other health centers but tetanus injection was not given. He had no significant medical history and his childhood immunization status was unknown. On examination, along with stiff neck, patient was agitated, diaphoretic, hypertensive and tachycardic with locked jaw and neck stiffness.

### Treatment Details

Patient was resuscitated and transferred to the intensive care unit. He was diagnosed as a case of severe tetanus and graded 3, according to Ablett classification for tetanus.<sup>11</sup> Patient was intubated and mechanical ventilation was

started. Initial blood tests and computed tomography of the head and neck were within normal limits and laboratory tests were carried out as required on subsequent days.

Tetanus toxoid injection 0.5 ml and tetanus immunoglobulin (TIG) 3000 IU intramuscularly were administered. The left great toe was amputated on the day of admission, and a wound swab was sent for culture/sensitivity. Following that, the patient had routine dressing under local anesthetic. Then, the patient was sedated with diazepam 10 mg per hour and injection labetalol was given to control blood pressure. The vecuronium infusion was started on the day of admission and gradually tapered off. It is the medicine of choice because it decreases autonomic instability and cardiac complications. Nasogastric tube feeding was started for nutritional support. Baclofen was given via nasogastric tube to treat hiccups and jerky abdominal movement. Fentanyl infusion was used for pain management and sedation. Respiratory failure was detected, after discontinuation of muscle relaxants and the decision for an early tracheostomy was made on the third day of the patient's admission. He was put on mechanical ventilation, on and off to alleviate muscular stiffness and improve respiratory muscle function. On day 40, the mechanical ventilator along with sedation was stopped. The patient tolerated 35% oxygen through a tracheal mask well and was gradually weaned off to room air. Metronidazole was given for antibiotic coverage. Magnesium sulfate was continued to be administered at the dose of 1 gram thrice daily with regular serum magnesium level monitoring.

An EEG was performed after the patient developed generalized tonic clonic seizure on the eighth day of admission and abnormal beta wave measurements were noted. The CT scan of the head showed no obvious findings. The patient was put under injection levetiracetam to control seizure. Injection Enoxaparin (Low Molecular Weight Heparin) was given for thromboprophylaxis. Physiotherapy for both the chest and the limbs was provided.

### Persistent Pyrexia: an unusual presentation

Patient developed a fever of 39 degrees celsius on the second day of admission. Based on culture and sensitivity data of infected tissue, urine and sputum samples which revealed fungus, *E. Coli* and *Klebsiella* respectively antibiotic given were injection polymyxin B, injection tigecycline and injection anidulafungin. Routine blood investigations along with inflammatory markers like CRP and ESR along with procalcitonin levels were measured regularly.

Despite appropriate management, including that of intravenous lines and bed sores, fever persisted. Repeat cultures of blood, urine, and sputum were sent. Surprisingly, there was no organism growth in any of them. In addition, WBC count was normal. Hence, autonomic lability was assumed to be the cause of the fever which persisted for 25 days and subsided upon relief of lockjaw.

The patient was eventually transferred to the medical ward, where he stayed for another ten days before being discharged home. He was regularly followed up for rehabilitation.



## DISCUSSION

Tetanus is a clinical diagnosis and laboratory tests are done only to support it. Around 70% of wound cultures are negative for *Clostridium tetani*. Even if the patient has protective antibodies, tetanus can still occur, making serologic testing a secondary test rather than the primary one.

Fever can be an unusual presentation in tetanus and may persist for longer duration. Severe muscle spasms and autonomic dysfunction are some of the possible causes of raised temperature.

For prophylaxis three doses of tetanus toxoid vaccination with booster doses every ten years is advised.<sup>12</sup> Tetanus immunization should be given to patients who have received fewer than three doses or an unknown number of doses of a tetanus toxoid-containing vaccine. Adults who have not previously been immunized against tetanus should receive a series of three vaccines (at least one Tdap vaccine; the other two can be Td or Tdap vaccines).<sup>13</sup> The preferred schedule is a Tdap vaccine dose followed by a Td or Tdap vaccine dose four weeks later and another Td or Tdap vaccine dose 6 to 12 months later. Regardless of prior tetanus and diphtheria immunization, Td immunization should be reviewed when anyone presents with an acute injury or wound and prophylaxis should be administered as soon as possible following a wound but should also be given even to patients who present late for medical attention.<sup>14,15</sup> After treatment and discharge, tetanus patients should be vaccinated to prevent a recurrence.

Tetanus vaccination should therefore be carried out more

extensively. It should be included in the primary vaccination series for adults who have never been vaccinated and a booster dose should be administered every 10 years to those who have completed the primary series. Management in an ICU setting gives a better chance of survival in patients with tetanus.

## LIMITATION OF STUDY

Diagnosis of tetanus was made clinically. *Clostridium tetani* could not be isolated from the culture.

## CONCLUSION

Despite routine immunization, tetanus still exists in developing countries like Nepal. In an ICU setting, it can be managed well with low mortality and morbidity. Fever may be an unusual problem in this disease. All the organic causes should be ruled out and muscle spasms could be the cause of persistent fever in a case of tetanus.

## ACKNOWLEDGEMENT

Department of Neuro medicine

## CONFLICT OF INTEREST:

None

## FINANCIAL DISCLOSURE

Self Funded

## REFERENCES

- Ernst ME, Klepser ME, Fouts M, Marangos MN. Tetanus: pathophysiology and management. *Ann Pharmacother*. 1997;31(12):1507-13.
- Farrar JJ, Yen LM, Cook T, Fairweather N, Binh N, Parry J, et al. Tetanus. *J Neurol Neurosurg Psychiatry*. 2000;69(3):292-301.
- LaForce FM, Young LS, Bennett JV. Tetanus in the United States (1965-1966): epidemiologic and clinical features. *N Engl J Med*. 1969;280(11):569-74.
- Bleck TP. Pharmacology of tetanus. *Clin Neuropharmacol*. 1986;9(2):103-20.
- Bleck TP. Tetanus: pathophysiology, management, and prophylaxis. *Dis Mon*. 1991;37(9):545-603.
- Wright DK, Laloo UG, Nayjager S, Govender P. Autonomic nervous system dysfunction in severe tetanus: current perspectives. *Crit Care Med*. 1989;17(4):371-5.
- van den Heever T, Spruyt MGL. The treatment of autonomic dysfunction in tetanus 2017.
- Erdmann G, Wiegand H, Wellhöner HH. Intraaxonal and extraaxonal transport of 125I-tetanus toxin in early local tetanus. *Naunyn-Schmiedeberg's Arch Pharmacol*. 1975;290(4):357-73.
- Chapter 2-12-4. Anaerobic infections (individual fields): tetanus. *Journal of Infection and Chemotherapy*. 2011;17:125-32.
- Mcelaney P, Iyanaga M, Monks S, Michelson E. The Quick and Dirty: A Tetanus Case Report. *Clin Pract Cases Emerg Med*. 2019 Jan 22;3(1):55-58. doi: 10.5811/cpcem.2019.1.41301. PMID: 30775666; PMCID: PMC6366372.
- Cook T, Protheroe R, Handel J. Tetanus: a review of the literature. *British Journal of Anaesthesia*. 2001;87(3):477-87.
- Kim DK, Bridges CB, Harriman KH, Practices obotACol. Advisory Committee on Immunization Practices Recommended Immunization Schedule for Adults Aged 19 Years or Older: United States, 2015\*. *Annals of Internal Medicine*. 2015;162(3):214-23.
- Liang JL, Tiwari T, Moro P, Messonnier NE, Reingold A, Sawyer M, Clark TA. Prevention of Pertussis, Tetanus, and Diphtheria with Vaccines in the United States: Recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR Recomm Rep*. 2018 Apr 27;67(2):1-44. doi: 10.15585/mmwr.rr6702a1. PMID: 29702631; PMCID: PMC5919600.
- Kim DK, Hunter P; Advisory Committee on Immunization Practices. Recommended Adult Immunization Schedule, United States, 2019. *Ann Intern Med*. 2019 Feb 5;170(3):182-92. doi: 10.7326/M18-3600. Erratum in: *Ann Intern Med*. 2019 Apr 2;170(7):512. PMID: 30716757.
- Centers for Disease Control and Prevention. Epidemiology and Prevention of Vaccine-Preventable Diseases. Tetanus. <https://www.cdc.gov/vaccines/pubs/pinkbook/tetanus.html>.

