



Tetanus Infection from Shared Needle: Analysis of Three Fatal Cases

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DOI <https://doi.org/10.64288/xpv8fa23>

Keywords: tetanus, parenteral drug use, tetanus prophylaxis, non-sterile needles

Abstract *This presentation analyzes the clinical progression and outcomes of three cases of tetanus infection in drug users who used non-sterile syringes and had similar epidemiological risk factors. Despite hospitalization from the emergency and critical care departments and receiving intensive therapy, all three patients succumbed to the disease. A striking observation was that earlier symptom onset correlated with earlier mortality. This aligns with literature findings, particularly studies indicating a sharply increased mortality risk in patients with an incubation period of ≤ 7 days. Although tetanus has become rarer in the era of vaccinations, it remains a significant concern among unvaccinated individuals, among drug users who utilize non-sterile injection methods. This case series underscores the rapid and lethal nature of tetanus in this high-risk group and highlights the urgent need for preventive measures.*

1. Introduction

Although tetanus has become a rare diagnosis since the introduction of widespread vaccination programs, it still contributes to significant morbidity and mortality worldwide. Clinically, tetanus is an acute, life-threatening disease characterized by muscle rigidity and spasms (1). It is caused by *Clostridium tetani* spores, which enter the body through skin abrasions or open wounds. In anaerobic conditions, these spores activate and release tetanospasmin, a neurotoxin that causes painful muscle contractions. High-risk groups include unvaccinated individuals, the elderly, diabetic patients, and intravenous drug users (2).

2.1. Patient 1

A 28-year-old male patient presented to the hospital with trismus, neck stiffness, and dysphagia seven days after using a non-sterile needle. Physical examination revealed widespread muscle spasms and respiratory distress.

Laboratory findings included leukocytosis ($15,200/\text{mm}^3$), elevated creatine kinase (18,000 U/L), mild renal and hepatic dysfunction, and altered mental status. Toxicology screening was negative for drug metabolites.

The patient received 5,000 IU of tetanus immunoglobulin (TIG), antibiotics, sedation with benzodiazepines, mechanical

ventilation support, and supportive therapy. Despite treatment, he succumbed to multiple organ failure three days after symptom onset.

2.2. Patient 2

A 34-year-old female patient presented with neck stiffness, opisthotonus, and dysphagia ten days after a drug injection. She exhibited seizures and cyanosis.

Laboratory findings included leukocytosis (17,300/mm³), elevated CK (21,500 U/L), hyperkalemia, and metabolic acidosis. Drug metabolites were not detected.

She administered 6,000 IU of TIG, antibiotics, midazolam, and mechanical ventilation support. Due to severe spasms, she died five days later.

2.3. Patient 3

A 19-year-old male presented to the emergency department with trismus, rigidity of the neck and back muscles, and difficulty swallowing and speaking on the 12th day after drug use. His vital signs were stable, and he was alert. Physical examination revealed pale mucous membranes, excessive sweating, an edematous hyperemic injection site at the cubital fossa, and old cut marks on his forearms.

Following consultations with infectious disease specialists, toxicologists, and neurologists, a diagnosis of tetanus was confirmed. The patient was administered 5,000 IU of TIG and admitted to the intensive care unit.

His symptoms had begun two days prior, and he had a history of recent drug use. Despite 12 days of intensive care treatment, he succumbed to the disease.

All three patients were brought to the hospital via emergency medical services and underwent initial Emergency and Critical Care Department assessment. None had a known vaccination status, and accurate information on their immunization history could not be obtained from relatives. Additionally, none had a history of typical traumatic injuries or open wounds related to tetanus. However, they had used the same non-sterile syringe multiple times, making it the likely infection source.

Comparison of Cases

<i>Parameter</i>	<i>Patient 1</i>	<i>Patient 2</i>	<i>Patient 3</i>
<i>Age</i>	28	34	19
<i>Gender</i>	Male	Female	Male
<i>CK (U/L)</i>	18,000	21,500	16,500
<i>Leukocyte Count (mm³)</i>	15,200	17,300	14,500
<i>Symptom Onset</i>	Day 7	Day 10	Day 12
<i>Mortality</i>	Day 10	Day 15	Day 20

3. Discussion

These three cases of tetanus were linked to non-sterile needle use, resembling previously reported international cases where drug users with unknown vaccination status presented with characteristic tetanus symptoms—trismus, muscle spasms, and dysphagia (3).

All three patients received TIG and intensive therapy. However, unlike a previously reported international case where the patient survived, all of our patients died despite their young age. This comparison highlights the critical role of early diagnosis, precise laboratory assessments, and comprehensive intensive care. It also underscores the need for vaccination campaigns and education on

sterile injection practices among high-risk groups.

A case study reported a 45-year-old male drug user with multiple open and purulent injection site wounds, one of which was identified as the infection source. His clinical presentation included trismus, dysphagia, and widespread spasms. Despite intensive treatment, he died (4).

While our three patients also had a history of drug use, they lacked the typical open wounds associated with tetanus infections. They had swelling and edema at injection sites but no visible purulent infections. This suggests that tetanus can develop not only from traumatic wounds but also silently from non-sterile injections. Therefore, clinical suspicion, proactive diagnosis, and prophylactic vaccination are crucial.

One key observation in our cases was the correlation between the incubation period and time to mortality. Patients with earlier symptom onset experienced more rapid disease progression and earlier death. Conversely, those with later symptom onset survived longer. This supports literature findings that severe tetanus is associated with shorter incubation periods.

A study conducted at Çukurova University found a 75% mortality rate among patients with an incubation period of ≤ 7 days, significantly higher than in those with longer incubation periods. This aligns with our findings (5).

A separate study from a tertiary hospital in Turkey between 1990 and 2000 found that patients with an incubation period of ≤ 8 days had a 4.8 times higher mortality risk. Additionally, each day of delayed hospital admission increased the mortality risk. Our cases exhibited a similarly rapid progression

to fatal outcomes, consistent with these findings (6).

In developing countries, including Azerbaijan, vaccine hesitancy due to social and cultural resistance, lack of scientific awareness, and inadequate vaccination monitoring continues to contribute to preventable diseases like tetanus, making them significant public health risks.

4. Conclusion

These three cases highlight how non-sterile needle use, unknown vaccination status, and delayed clinical intervention resulted in fatal outcomes. The inverse correlation between incubation period length and mortality rate suggests that it may serve as a crucial prognostic factor. Tetanus remains a critical issue in high-risk groups such as drug users, emphasizing the urgent need for strengthened vaccination programs and public health awareness initiatives.

5. References

1. Control CfD, Prevention, Program NI, Prevention), Program NI, Education P, et al. Epidemiology and prevention of vaccine-preventable diseases: Department of Health & Human Services, Public Health Service, Centers for ...; 2005.
2. McElaney P, Iyanaga M, Monks S, Michelson E. The Quick and Dirty: A Tetanus Case Report. *Clinical practice and cases in emergency medicine*. 2019;3(1):55-8.
3. O'Malley C, White E, Schechter R, Smith N, Waterman S. Tetanus among injecting-drug users--California, 1997. *JAMA: Journal of the American Medical Association*. 1998;279(13).
4. Francois MP, Roberts JR, Hewlett D. Tetanus in a parenteral drug abuser: report of a case. *Journal of the National Medical Association*. 1994;86(3):223.

5. Saltoglu N, Tasova Y, Midikli D, Burgut R, Dündar I. Prognostic factors affecting deaths from adult tetanus. *Clinical Microbiology and Infection*. 2004;10(3):229-33.
6. Ergonul O, Erbay A, Eren S, Dokuzoguz B. Analysis of the case fatality rate of tetanus among adults in a tertiary hospital in Turkey. *European Journal of Clinical Microbiology and Infectious Diseases*. 2003;22:188-90.

