

An Unusual Case Report of Tetanus with Convulsion and Breathlessness in Child

Deepak Jha^{1,*}, Dipali Rathod¹, Md Akbar², Ayaz Shaikh³

¹Department of Pharmacy Practice, ASPM's K. T. Patil College of Pharmacy, Dharashiv, Maharashtra, INDIA.

²School of Pharmacy, Al-Karim University, Katihar, Bihar, INDIA.

³Department of Pediatrics, Sparsh Children Hospital, Latur, Maharashtra, INDIA.

ABSTRACT

Tetanus is an uncommon, severe infection that poses a life-threatening risk and is primarily caused by the bacterium *Clostridium tetani*. In this case report, we present the clinical manifestation of tetanus in a 6-year-old boy, which includes symptoms such as fever, jaw and neck muscle contraction, convulsions, and difficulty in breathing. The patient was treated with a combination of tetanus immunoglobulin, antibiotics, antipyretics, and sedatives. Laboratory investigations unveiled an increased white blood cell count with a normocytic, hypochromic blood profile with neutrophilia. The patient recovered successfully after 10 days of hospitalization. This case report highlights the significance of tetanus vaccination and the crucial role of prompt management of tetanus, and if left untreated can lead to severe complications and death.

Keywords: Tetanus, Convulsion, Breathlessness, Child, Life-threatening.

Correspondence:

Mr. Deepak Jha

Department of Pharmacy Practice,
ASPM's K. T. Patil College of Pharmacy,
Dharashiv-413501, Maharashtra, INDIA.
Email: drdbjmw@gmail.com

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INTRODUCTION

Tetanus is an uncommon acute infection caused by spores of the bacteria called *Clostridium tetani*, and it occurs within 3 to 21 days, with an average onset of 14 days following infection.^{1,2}

This infection is not transmissible;² however, it enters the body through various means, such as contaminated wounds containing dirt, feces, or saliva, puncture wounds caused by nails or needles piercing the skin, burns, crush injuries, surgical procedures, dental infection, etc. It can lead to the death of 1 to 2 in 10 cases. Therefore, tetanus vaccination is recommended for people of all ages.¹

This case report discusses a serious case of tetanus in a child characterized by convulsions and breathing difficulties. We wanted to report this unusual case as we could not find any similar case in the PubMed database during our literature search.

CASE REPORT

A 6-year-old boy presented with a fever (102°F), cough, muscle contraction of the jaw and neck, convulsions, and difficulty in breathing at Sparsh Children Hospital, Latur, Maharashtra, India. Additionally, we found that the patient had tachycardia (141 beats

per minute [bpm]), tracheitis, an ear infection, and complaints of dysphagia.

Further, on laboratory examination, we found white blood cell count was significantly elevated, which is indicative of an underlying condition such as infection, inflammation, or stress. The mean corpuscular volume and mean corpuscular hemoglobin were non-significantly lower than the normal range.

We initiated treatment with Normal Saline (NS), Potassium Chloride (KCL), and a half bottle of Dextrose and Sodium Chloride (DNS) at a dose of 50 mL per hour (mL/hr) (2 bottles per day for 6 days), injection tetanus immunoglobulin (500 International Unit [IU]), and diclofenac sodium (1/150) at 1 mL per hour (mL/hr) (two times a day for one day). Additionally, we administered injections such as ceftriaxone (1.5 g), azithromycin 500 mg, granisetron 1mg, and glycopyrrolate 1mg two times a day for 3 days. Later, we reduced the frequency of injection of granisetron 1mg to once a day for 5 days. We then added an injection of metronidazole and tranexamic acid (three times a day for 4 days), as well as an injection of phenobarbitone, injection of diclofenac, injection of butorphanol, and pantoprazole three times a day for 4 days. On the third, fourth, and fifth day of admission, the patient received injections such as vancomycin, diazepam, and tryptophan twice daily. Finally, an injection of levetiracetam was started two times a day for 5 days from the fifth day of hospital admission, and the patient recovered successfully for discharge.



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LABORATORY TEST RESULTS

Tests	Day 1	Day 4	Day 7	Unit	Reference Range
	Results				
Hemoglobin	12.7	11.3	11.4	g/dL	12-16
R.B.C count	5.08	4.52	4.44	Mil/cmm	4.5-6.5
Total W.B.C count	15800	13100	12000	/cmm	4000-11000
Platelet count	365000	411000	455000	/cmm	150000-450000
Red Cell Absolute Values					
Packed cell volume	40.2	35.7	35.7	%	40-55
Mean corpuscular volume	79.1	79.0	80.4	cu micron	80-90
Mean corpuscular hemoglobin	25.0	25.0	25.7	Picograms	26-34
Mean corpuscular hemoglobin concentration	31.6	31.7	31.9	g/dL	31-37
Differential Count					
Neutrophils	85	78	79	%	40-75
Lymphocytes	12	11	15	%	20-40
Eosinophils	01	05	02	%	0-6
Monocytes	02	06	04	%	0-8
Basophils	00	06	00	%	0-1
Peripheral Smear Examination					
Erythrocytes	Normocytic mild hypochromia	Anisopiokilocytosis - Microcytes-Poikilocytes - Mild hypochromia	Normocytic mild hypochromia	NA	NA
Impression	Normocytic hypochromic blood picture with neutrophilia	Microcytic hypochromic blood picture	Normocytic hypochromic blood picture	NA	NA
Serum Electrolytes					
Serum sodium	138	139	145	mmol/L	135-145
Serum potassium	4.3	5.1	3.6	mmol/L	3.5-5.5
Serum calcium	1.27	1.28	1.24	mmol/L	1.09-1.30
SGOT, serum glutamic-oxaloacetic transaminase	-	-	43.9	U/mL	8-40

Serum Electrolytes: Test done on ROCHE 9180 Electrolyte analyser; SGOT: Reitman and Frankel's; cmm: cubic meter; cu: cubic; g/dL: gram per deciliter; Mil/cmm: million per cubic meter; mmol/L: millimoles per liter; NA: not applicable; RBC: Red blood cell; SGOT: Serum glutamic-oxaloacetic transaminase; U/mL: Units per milliliter; WBC: White blood cell; %: Percentage.

DISCUSSION

Tetanus is a serious, highly lethal, and completely preventable disease³ that still exists worldwide, with more than 10,000 cases reported in recent years. This case report highlights the importance of considering tetanus infection, even in first-world countries, when evaluating non-immunized children exhibiting unexplained oropharyngeal symptoms. The clinical signs of our patient at the onset of his illness were similar to other cases of neonatal tetanus that we have seen or were reported.^{4,5} However, no permanent neurological damage has been reported among survivors of tetanus neonatorum.⁶⁻⁸

Within the existing literature, only two case reports involving adults in first-world countries highlighted the diagnostic difficulty associated with oropharyngeal symptoms in cases of generalized tetanus.^{9,10} Both patients exhibited isolated symptoms of trismus and dysphagia, leading to initial misdiagnosis. However, they rapidly deteriorated, requiring prolonged intensive care due to respiratory failure,⁹ or autonomic dysfunction.¹⁰ These reports underscore the challenge of recognizing generalized tetanus with only oropharyngeal symptoms, which carry a significant risk of rapid clinical deterioration.

In addition to diagnostic challenges, distinguishing between localized and generalized tetanus presents a significant difficulty. Localized tetanus typically manifests with muscle spasms limited to specific areas and tends to have a favorable outcome. However, in rare cases of cephalic tetanus, the condition can progress to generalized tetanus, which is associated with a high mortality rate.⁹

The appropriate treatment of generalized tetanus includes neutralizing the free-circulating tetanus toxin, performing surgical debridement, eliminating the bacterial burden, and delivering comprehensive supportive care. Human Tetanus-Specific Immunoglobulin (TIG) can neutralize tetanospasmin,¹¹ although there is conflicting information regarding the most effective dosage and administration method.¹² According to a recent meta-analysis, the combined administration of TIG via both intramuscular and intrathecal routes has demonstrated superior efficacy in reducing tetanus-related mortality when compared to intramuscular treatment alone.¹³ The eradication of bacterial load can be achieved through the use of regimens based on either penicillin or metronidazole. A clinical trial comparing the two drugs revealed no significant differences in in-hospital mortality or the occurrence of autonomic dysfunction.¹⁴ The most significant factor in reducing mortality associated with generalized tetanus is the provision of treatment in a modern pediatric intensive care unit that implements aggressive sedation protocols and offers advanced ventilatory support. Benzodiazepine derivatives serve as the primary method of sedation in such cases.¹⁵ There have

been reports of direct damage to muscle and peripheral nerves after tetanus,^{16,17} but this was not present in the patient described.

CONCLUSION

Tetanus is a life-threatening disease that requires prompt diagnosis and treatment. Diagnosing generalized tetanus in children can be challenging even in first-world countries, as the typical symptoms may not manifest initially. The early identification and prompt initiation of advanced critical care are vital to prevent swift clinical decline. Therefore, when evaluating non-immunized children who present with a sudden onset of dysphagia and trismus, it is imperative to consider generalized tetanus in the differential diagnosis. It is crucial to educate healthcare personnel about the disease through study programs and to implement strategies to increase vaccination rates and eradicate the disease.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

ABBREVIATIONS

bpm: Beats per minute; **DNS:** Sodium chloride; **F:** Fahrenheit; **KCL:** Potassium chloride; **NS:** Normal saline; **TIG:** Tetanus-specific immunoglobulin.

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