



Generalised Tetanus in a Two-Month-Old Child: A Preventable Cause of Morbidity and Mortality

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ARTICLE'S INFO

Article No.: 041526054

Type: Case Report

Full Text: [PDF](#), [PHP](#), [HTML](#), [EPUB](#), [MP3](#)

DOI: [10.15580/gjbhs.2026.1.041526054](https://doi.org/10.15580/gjbhs.2026.1.041526054)

Accepted: 16/04/2026

Published: 23/04/2026

Keywords: Apnoea, Convulsion, Reflex spasticity, Tetanus, Vaccine

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Article's QR code



ABSTRACT

Background: Generalized Tetanus is a vaccine-preventable fatal infectious disease, yet it remains an important cause of death worldwide and is associated with a high case mortality, particularly in the developing world.

Case: A two-month-old male infant presented with features of generalized tetanus: trismus, rigidity, reflex spasticity, and apnoeic attacks. The child had a tiny necrotic area involving the tip of his right big toe. The patient responded poorly to cardiothoracic resuscitation with 100% oxygen. His short hospital stay was characterized by a recurrence of apnoea and active resuscitation. The patient's delivery was at home, unsupervised. He had yet to receive any dose of any vaccine. Mother is a 26-year-old woman, para5, 2 alive, who has never received tetanus toxoid in this pregnancy or previously. The patient received only the first dose of Intravenous (IV) metronidazole 100mg. Anti-tetanus immunoglobulin administration after a test dose, IV diazepam, Chlorpromazine, and Phenobarbitone were given to neutralize the toxins, control convulsion, spasticity, and to relieve symptoms. The patient was commenced on 10% intravenous glucose in 0.9 normal saline at 150mls/kg/day. The patient responded poorly despite interventions and died 6 hours into admission.

Conclusion: Morbidity and Mortality in infants resulting from tetanus are highly preventable through vaccination of both mothers and newborns. There is therefore a need to double our efforts to ensure that the general populace acquires adequate knowledge on the fatality and prevention of tetanus through vaccination. There is a need to scale up our immunization coverage.

INTRODUCTION

Tetanus is a severe infection that poses a life-threatening risk; it is characterised by painful muscular spasm, hypertonia, and autonomic nervous system dysfunction.[1] Tetanus is primarily caused by the bacterium *Clostridium tetani*, with an incubation period of about 7 to 21 days, and an average time of manifestation of 10 to 14 days following infection.[2, 3] Various routes of entry of the organism into susceptible patients have been demonstrated, which include but not limited to puncture wounds caused by nails or needles piercing the skin, burns, crush injuries, contaminated wounds containing dirt, faeces, or saliva, surgical procedures, some traditional practices, dental infection, otitis media, human and animal bites.[4] The diagnosis of tetanus is primarily clinical; reliance on radiology, hematology, clinical chemistry, and microbiology investigations is usually inadequate for confirmation. [5, 6] There is also a need to investigate recent wound incidences, and additional information concerning the patient's immunization status is also crucial. [1] Tetanus infection portends a very high case fatality if adequate intervention is delayed. Hence, prevention of tetanus infection through vaccination of the appropriate target population is the way out in preventing unnecessary mortality in the sub-regions. [7, 8]

This case report presents a two-month-old boy who presented with features of generalized tetanus. However, the patient responded poorly despite interventions and died 6 hours into admission. The purpose of this paper is to emphasize the need for free

or highly subsidized compulsory antenatal care for pregnant mothers and to ensure that the mothers as well as the infants receive vaccination as due.

CASE PRESENTATION

A two-month-old male infant presented with features of generalized tetanus: trismus, rigidity, reflex spasticity, and apnoeic attacks. The child had a tiny necrotic area involving the tip of his right big toe. On admission, the patient responded poorly to cardiothoracic resuscitation with 100% oxygen. His short hospital stay was characterized by a recurrence of apnoea and active resuscitation. The patient's delivery was at home, unsupervised. He had yet to receive any dose of any vaccine. Mother is a 26-year-old woman, para5, 2 alive. Her pregnancy was unbooked; she had no antenatal care, and never received tetanus toxoid in this pregnancy or previously.

CLINICAL PRESENTATION

A 2-month-old male was admitted into our facility unconscious, following a 2-week history of fever, inability to suckle at the breast, reduced activity, inability to cry, and recurrent convulsions characterised by stretching of the upper and lower limbs that lasted 3 to 5 minutes each time.

Clinical examination revealed an unconscious infant with a Glasgow Coma Score (GCS) of 3; he was pale in room air with a packed cell volume (PCV) of

23% and an axillary temperature of 39.60 °C with cold extremities.

There was a dark area of about 0.3 by 0.3-centimetre (cm) necrosis at the tip of the right big toe. The wound, which started as a little dyspigmentation, was noticed by the mother a week before the child's illness. It was left unattended. He had yet to receive any dose of any vaccine. He received only the first dose of Intravenous (IV) metronidazole 100mg 6hly. The plan was to debride and dress the wound after resuscitation. Other interventions included Anti-tetanus immunoglobulin administration after a test dose, IV diazepam, Chlorpromazine, and Phenobarbitone to neutralize the toxins, control convulsions, spasticity, and relieve symptoms. The patient was commenced on 10% intravenous glucose in 0.9 normal saline at 150 mls/ kg /day. The patient responded poorly despite interventions and died 6 hours into admission.

INVESTIGATION

The Patient's White blood cell count (WBC), total white blood cell count (TWBC), Packed Cell Volume (PCV), Malaria parasite count (*Plasmodium falciparum*), and serum electrolytes were measured. These investigations were done at the University laboratory, Federal Teaching Hospital, Lokoja. The results of the analysis are presented in Table 1.

DISCUSSION

Tetanus is a rapidly fatal disease, which continues to pose a very high disease burden in sub-Saharan Africa. The solution to preventing unnecessary morbidity and mortality due to tetanus infection is through vaccination of the appropriate target population. [3, 4] Achieving this goal involves resourceful and strategic public health outreach. [9, 10] Additionally, there is a need to educate people on the significance of adhering to the tetanus toxoid vaccine booster schedule and seeking medical attention after sustaining a tetanus-prone wound. [1] This case report demonstrates the importance of antenatal care for pregnant mothers and the need for both maternal and neonatal vaccination. Studies have shown that most of the children with cases of post-natal tetanus are those who have never been immunized or those who had incomplete tetanus toxoid shots. [11] In this case study, both the mother and the infant had no history of receiving immunization of any sort in the past. Before this child's illness, the mother had no information about tetanus or tetanus immunization. [1] In addition, the mother has never attended antenatal care nor

delivered in the health care facility. Her delivery was usually at home, with no neonatal and maternal immunization. She had a history of child death, which occurred due to neonatal tetanus. Similar incidences of mothers not receiving tetanus immunization and having deliveries outside health facilities have been reported from previous cases of neonatal and post-natal tetanus among children, who were admitted to a clinic between year 1995-2015, in which the fatality rate was 45%. [11] There is therefore a need to overcome cultural barriers to vaccine administration. Furthermore, this underscores the importance of improving community health-seeking behavior and further strengthening primary healthcare services. The mother of this patient lives within a sixteen-kilometre radius of a state capital with four tertiary health facilities, eighteen well-equipped secondary care facilities, numerous primary health care centres, and many private health institutions. The patient's father works as a junior staff member in a company; he also keeps sheep, goats, and cows within the family residence of about 2,220²M, which could serve as a reservoir for *Clostridium tetanus*. [12, 13] Hence, cost-effective prevention by immunization of pregnant mothers with tetanus toxoid and infants is key to combating morbidity and mortality due to tetanus in newborns and children. [12-15]

CONCLUSION

Generalised tetanus is a preventable, life-threatening clinical condition that requires early diagnosis and appropriate treatment. It is unfortunate that the disease still constitutes a significant quantum of morbidity and mortality despite the efforts of the government, non-governmental, and other development partners. This child's death was preventable because the sub-region has a well-structured program for tetanus prevention with the ultimate goal of its eradication. As an institution or individual, there is a need to double our efforts using every means available to ensure that the general populace acquires adequate knowledge of the prevention of tetanus as well as other preventable diseases. There is a need to scale up our immunization coverage. Inter-ministerial collaboration is also important in achieving this seemingly huge but achievable objective. More support and priority should be given to policies and programmes in this direction, such as the Universal Health Coverage (UHC) and Sustainable Development Goals (SDGs). Government at all levels should scale up support, both financial and logistics to the Primary Health Care (PHC).

Table 1: Tabular Representation of the Patient's Laboratory Results

	Day 1	Reference value
Full blood count		
PCV (%)	23.0	42.0 – 50.0
Haemoglobin (g/dL)	7.7	14.0 - 16.7
Platelet count (/cmm)	205,000	150,000-450,000
TWBC (/cmm)	15,500	4000-11000
Neutrophils (%)	76.0	40.0 – 65.0
Lymphocytes (%)	21.5	20.0 – 40.0
Eosinophils (%)	0.7	0.0 – 6.0
Monocytes (%)	0.3	0.0 – 8.0
Basophils (%)	0.5	0.0 – 1.0
Rapid malaria test		
m-RDT	Negative	NA
Peripheral blood film examination		
Malaria Parasite /200 WBC	NIL	NA
Serum Electrolyte		
Sodium (mmol/L)	135.0	135-145
Potassium (mmol/L)	3.5	3.5 – 5.5
Chloride (mmol/L)	102.0	94.0 – 110.0
Calcium (mmol/L)	1.26	1.15-1.30
Urea (mmol/L)	7.0	1.70 – 8.3
Creatinine (mmol/L)	106.0	60.0 – 130.0

ACKNOWLEDGEMENT

We do appreciate the family of this two-month-old child and the management of Grand Specialist Hospital, Lokoja, Kogi State, Nigeria, for giving their consent to use this medical record to carry out this case reporting. We sincerely sympathize with them for their loss.

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Cite this Article: Ajetomobi, A; Bello, AJ, Olanrewaju, PO; Tunmise, TO; Toye, II (2026). Generalised Tetanus in a Two-Month-Old Child: A Preventable Cause of Morbidity and Mortality. *Greener Journal of Biomedical and Health Sciences*, 9(1): 60-64, <https://doi.org/10.15580/gjbhs.2026.1.041526054>.