Rovedar

JVPP

Journal of Veterinary Physiology and Pathology. 2026; 5(1): 21-25.

DOI: 10.58803/jvpp.v5i1.83

http://jvpp.rovedar.com/

Case Report

Neonatal Tetanus in A Red Sokoto Kid: A Case Report

Opaluwa Kuzayed Imaben Grace[1*], Gloria Pisha Karaye[2], Andara Joseph Mamani[3], Ayopelumi Tunde-Dada[3], Makchit Galadima[1], and Tughgba Terzungwe[4]

[1] Department of Theriogenology and Production, University of Jos, Jos, Nigeria
[2] Department of Medicine, University of Jos, Jos, Nigeria
[3] Department of Microbiology, Faculty of Veterinary Medicine, University of Jos, Jos, Nigeria
[4] Department of Theriogenology/Production, Joseph Sarwuan Tarka University, Makurdi, Nigeria

* ***Corresponding author:*** Opaluwa Kuzayed Imaben Grace, Department of Theriogenology and Production, University of Jos, Jos, Nigeria. Email: gikuzy@gmail.com

ARTICLE INFO

Article History:
Received: 12/01/2026
Revised: 15/02/2026
Accepted: 03/03/2026
Published: 30/03/2026

check for updates

Keywords:
Muscle
Neonate
Red Sokoto kid
Stiffness
Tetanus

ABSTRACT

Introduction: Neonatal tetanus, known as tetanus neonatorum, occurs in infants born to mothers who lack adequate immunization against the *Clostridium tetani* (*C. tetani*). Tetanus is a disease that affects animals and humans of all ages. The present study aimed to document neonatal tetanus in a 6-day-old male red Sokoto kid.

Case report: A 6-day-old male red Sokoto kid weighing 1.4 kilograms, was presented to the Large Animal Clinic of the Veterinary Teaching Hospital, University of Jos, Nigeria, with a chief complaint of inappetence for suckling milk from its mother and weakness lasting 6 days. Clinical examination revealed a rectal temperature of 36.7°C, a pulse rate of 72 beats per minute, and a respiratory rate of 64 cycles per minute. The kid presented with generalized muscle stiffness, trismus (lockjaw), bilateral opisthotonus, hyperesthesia, a characteristic sawhorse stance, and a prolapsed third eyelid. As tetanus is a clinical diagnosis with no definitive laboratory test, therefore, confirmation was based on the pathognomonic clinical signs and the kids' history. The kid was hospitalized and kept in a dark and quiet room, where procaine penicillin, tetanus antitoxin, piroxicam (analgesic and antipyretic), multivitamin (nerve supplement), diazepam (muscle relaxant), and saline dextrose 5 % (fluid therapy) were administered, but the kid did not survive and died on the third day. Due to the case history, unsanitary environmental conditions where the kid was delivered, and signs observed that were characteristic of tetanus, the disease was diagnosed.

Conclusion: Increasing the hygiene during parturition should be encouraged, the umbilicus should be disinfected after parturition, and treatment of open wounds should be carried out immediately after a cut or injury occurs. The present findings emphasized the importance of preventing and controlling tetanus through vaccination, which can reduce economic losses and enhance overall animal health.

1. Introduction

Neonatal tetanus is a relatively common toxemic, noninfectious Clostridial disease that affects young animals of all species. Tetanus is characterized by generalized muscle stiffness, tremors, lockjaw, and prolapse of the third eyelid[1]. Neonatal tetanus is a highly fatal disease with case fatality rates of over 80% in neonates[2]. Tetanus is a bacterial disease caused by spores of the gram-positive rod *Clostridium tetani* (*C. tetani*), a spore-forming organism ubiquitous in nature[3]. *Clostridium tetani* produces the potent neurotoxin tetanospasmin, which blocks the release of inhibitory neurotransmitters at the synapse, leading to uncontrolled muscle contraction, rigidity, and the characteristic spasms observed in tetanus[3]. Horses, sheep, and goats are more susceptible to the disease, with cattle, dogs, and cats being less susceptible, while birds are resistant[4]. Tetanus spores are commonly found in soil

Cite this paper as: Imaben Grace OK, Karaye GP, Mamani AJ, Tunde-Dada A, Galadima M, and Terzungwe T. Neonatal Tetanus in A Red Sokoto Kid: A Case Report. Journal of Veterinary Physiology and Pathology. 2026; 5(1): 21-25. DOI: 10.58803/jvpp.v5i1.83

samples from all parts of the world[5]. Sporulation for *C. tetani* occurs under both aerobic and anaerobic conditions, making the bacteria dangerous to both animals and humans[4]. As with most spore-forming bacteria, sporulation depends on environmental temperature, moisture, and pH[4]. The disease usually occurs as a result of wounds infected by the spores of the organism[6]. Incubation period of *C. tetani* ranges from days to months with an average of 10-14 days. In the early stages of the disease, neonates may present with non-specific signs such as fever, congested mucus membranes, and decreased suckling or inappetence for their mother's milk[7].

As the disease progresses, more specific clinical signs become evident, including generalized muscle contractions and stiffness (tetany), as well as hyperesthesia in response to stimuli such as noise, light, and touch[7]. Most muscles of the body usually affected are the masseter muscles which causes the lock-jaw, the ear muscles causing the erect ears, the limbs are also affected causing the characteristic Wooden or Saw-horse stance, the tail is also affected causing tail stiffness, neck and back leading to the extension of the head, ocular involvement leading to loss of corneal reflexes and prolapse of third eyelid. All the affected muscles are characteristic of voluntary muscle hyperactivity, which leads to rigidity and tetanic spasms[7]. Difficulties in moving limbs and seizures are common. Death is usually due to respiratory paralysis, usually of the larynx and diaphragm[4].

The diagnosis of tetanus is usually difficult initially at the onset of the condition, as it is usually misdiagnosed with other paralytic diseases where myopathies occur[8,9]. Recent history of age, environment, hygiene, and traumatic injury, accompanied by presenting clinical signs, is usually sufficient for diagnosis of neonatal tetanus[9,10]. Confirmatory diagnosis is by culture and identification of the spore-forming gram-positive bacteria via Gram staining[11]. Polymerase chain reaction (PCR) can also be performed on wound materials[12]. Differential diagnosis of neonatal tetanus includes starvation or hypocalcemia, poisonings like strychnine intoxication, and other infectious and non-infectious causes of seizures, myopathies, and spastic paralysis[13].

Effective management and recovery depend heavily on early detection of tetanus in neonates. Supportive therapy with tetanus antitoxin (TAT) and broad-spectrum antibiotics is effective and constitutes the Tetanus-specific treatment. The choice of therapy depends on the clinical signs at presentation[12]. Supportive therapy may also include isolating the neonate in a quiet place to reduce hyperesthesia, nursing care, washing, and disinfecting the washed site to reduce the bacterial load at the site of infection[2,14]. In puppies and kittens, care should be taken when administering TAT to observe for hypersensitivity and allergic reactions[15]. Successful treatment and management of tetanus have been achieved with the administration of antibiotics, such as procaine penicillin and tetanus antitoxin[14]. Supportive therapy using an intravenous injection of a muscle relaxant, such as diazepam[16], a respiratory stimulant, such as deriphyllin, an analgesic and antipyretic, such as meloxicam, a multivitamin to serve as a nerve supplement [17,18], and fluid therapy using 5% dextrose saline, can help resolve the animals' condition[14,17].

The prevention of neonatal tetanus can be enhanced through active or passive immunization and proper hygiene practices[19]. Pregnant animals, such as ewes and mares, should be vaccinated with the tetanus toxoid, ideally during the last few weeks of pregnancy, to provide passive immunity to newborns via colostrum[9,10], which is the first milk produced during pregnancy. The colostrum plays an important role in building the young one's immune system[9,10]. A booster dose may be recommended before lambing or foaling, depending on the species and local prevalence of tetanus[10]. The prognosis for tetanus is usually poor to guarded, especially because the condition is not detected when there is a delay in diagnosis.

Active immunity is achieved by administering tetanus toxoid to foals at 5-8 weeks of age[20]. In endemic regions such as Sub-Saharan Africa, foals may be administered tetanus antitoxin immediately after birth and subsequently every 2-3 weeks, especially if the dam was not vaccinated until 2-3 months old, at which time they can be administered toxoid[21]. The environment where an animal stays, where they give birth, and the materials to be used during delivery should be cleaned regularly and disinfected. After parturition, the umbilical stump of the young one should be cleaned with antiseptic (chlorhexidine) for at least three days to reduce the risk of infection[22]. Appropriate wound management should be carried out efficiently. In suspected cases of neonatal tetanus, prompt presentation of the patient to the clinician should be ensured for effective therapy[23]. The present study aimed to describe the clinical presentation, diagnosis, management, and outcome of neonatal tetanus in a 6-day-old red Sokoto kid, and to highlight the importance of hygienic parturition practices and vaccination in preventing tetanus in small ruminants.

2. Case report

A 6-day-old male red Sokoto kid weighing 1.4 kilograms, was presented to the large animal clinic of the veterinary teaching hospital, University of Jos, Nigeria, on the 22nd January, 2026, with the major complaints of reluctance to feed and weakness, which had lasted for about three days since it was noticed. According to the history, the kid was delivered as a twin from an unvaccinated dam. Although the other twin was healthy, this kid was weak and unable to suckle milk without help. The kid had a history of unsuccessful treatment by the owner, which led to presentation to the university of Jos veterinary teaching hospital, Plateau State, Nigeria. Clinical examination revealed a rectal temperature of 36.7°C, a pulse rate of 72 beats per minute, and a respiratory rate of 64 breaths per minute. Upon further clinical examination, there was stiffness in all the limbs (Figure 1A) and inflammation around the naval area (Figure 1B), trismus (lock jaw), opisthotonus to both sides, hyperesthesia, wooden horse appearance (saw horse stance), and prolapse of the third eyelid (Figure 2).

Blood or chemical analysis was not conducted due to financial limitation. The clinical presentation, along with a history of unsanitary environment and neglect of umbilical care, was suggestive of neonatal tetanus. Consent was obtained from the owner before the examination.

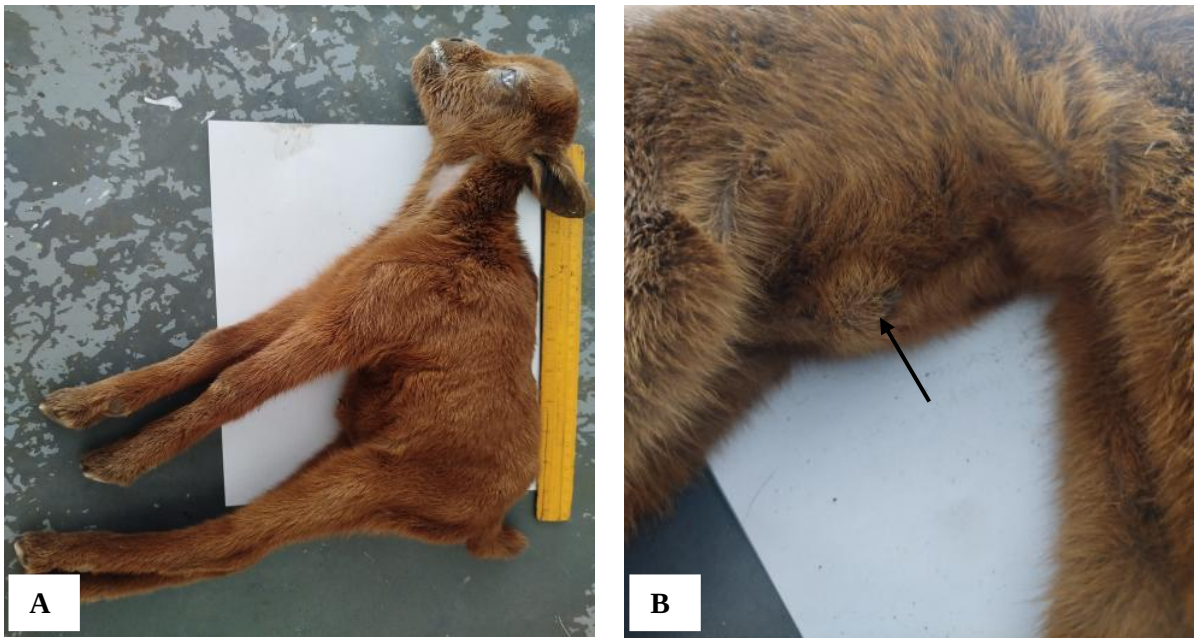

Figure 1. Saw horse stance in a 6-day-old male red Sokoto kid. **A**: showing stiffness in all the limbs, wooden horse appearance (saw horse stance), **B**: Inflamed naval area (Arrow).

Figure 2. Locked jaw and prolapse of the third eyelid (trismus; black arrow) in a 6-day-old male red Sokoto kid

3. Management and treatment

The kid was kept in a dark, quiet room, where 1 mL of tetanus antitoxin® (ATS, 1,500 IU; Jiangxi Institute of Biological Products Inc., China) was administered intramuscularly (IM) as a single dose to neutralize circulating toxin. Additionally, 1 mL per 10 kg body weight of procaine penicillin antibiotic (Penstrep-400®, 200,000 IU/200 mg; Interchemie werken "De Adelaar" BV, Netherlands) was administered IM, thrice daily for two days. Diazepam (10 mg/mL; Pfizer Inc., New York, NY, USA) was administered IM to assist with muscle relaxation, and 5% saline-dextrose at 10 mL/kg/hour was given IV to maintain hydration[22]. Piroxicam was given subcutaneously at 1 mL/50 kg body weight for analgesia and antipyresis, and 1 mL of multivitamin was administered subcutaneously as a nerve supplement[22]. During and after treatment, the kids' clinical signs were closely monitored for any signs of improvement. Unfortunately, the kid did not show any obvious sign of improvement and later died three days after hospitalization.

4. Discussion

In the present case, delivery occurred without skilled supervision in an unhygienic environment, and there was no documented evidence of maternal tetanus immunization; all these factors are known to increase the risk of *C. tetani* infection[6,10]. Inflammation of the umbilical area and clinical signs observed in the present study suggested tetanus, consistent with the findings of Siddiqui et al.[14], Tizzard[9], and Esmaeli et al.[25], who reported that tetanus infection is generally acquired through open wounds in any part of the body. The umbilical stump is the most common route of entry for *C. tetani* in neonates, usually under unsanitary parturition conditions[14], which aligns with the present case, as evidenced by the inflamed umbilical area. Traumatic injuries such as accidents or different procedures such as docking, hoof trimming, injection sites, castration, and surgeries have been implicated in causing tetanus in young animals (<1 month of age)[14]. Contaminated materials and fomites, particularly those used in postnatal care such as cutting instruments, cotton wool, bedding material, gloves, resuscitation equipment, are common sources of infection[6], which is consistent with the present findings that the environment

where the kid was delivered was contaminated. This served as the source of infection through the newborn's umbilicus. The age of the kid (seven days) falls within the incubation period of C. *tetani* infection, which ranges from days to months, with an average of 10-14 days.

The neonate initially presented with nonspecific signs, including fever, but the temperature dropped to 36.7 °C. There were also congested mucus membranes and decreased suckling or inappetence in the kid, which are consistent with signs typically observed in the early stage of tetanus[7]. The drop in temperature signified that there were severe complications, the presence of severe metabolic collapse staging a terminal stage of the disease. The continuous excitatory signals, especially in the muscles, leading to generalized spastic paralysis of the limbs, were caused by *C. tetani*, which produces a neurotoxin, TeNT, and a hemolysin known as tetanolysin[5,24]. *C. tetani*, upon entry through open wounds under appropriate anaerobic conditions, produces both toxins. The hemolysin (tetanolysin) aids in local tissue destruction, while the neurotoxin tetanospasmin is released and travels via the bloodstream and nerves[5]. This tetanospasmin is released into the bloodstream, leading to generalized stiffness of the limbs and tail, and erect ears[25,26], which were consistent with the clinical signs observed during the present study. As the disease progressed, the kid exhibited more specific signs, such as generalized muscle contractions and stiffness (tetany) and hyperesthesia, characterized by increased sensitivity to stimuli like noise, bright light, and physical touch. Most muscles were affected, such as the masseter muscles, evidenced by the lock-jaw, the ears were erect, and the kid's limbs had a wooden or saw-horse stance. Clinical signs included tail stiffness, extension of the neck and back, loss of corneal reflexes, prolapse of the third eyelid, and flared nares, all characteristic of voluntary muscle hyperactivity leading to rigidity and tetanic spasms[7,26]. These signs were observed in the present case before the kid died. Additionally, difficulties in movement and seizures were among the signs presented before the kid eventually died. The death of the kid resulted from respiratory paralysis (usually of the larynx and diaphragm)[4]. Treatment for this kid failed because the goat kid was not presented early for prompt attention, as at the time of presentation, the kid was already showing advanced neurological signs, which made the prognosis for the condition very grave.

5. Conclusion

The present study documented a 6-day-old red Sokoto kid exhibiting classic clinical signs of neonatal tetanus, including generalized muscle stiffness, trismus, opisthotonus, hyperesthesia, sawhorse stance, and prolapse of the third eyelid, which ultimately led to death despite supportive treatment, highlighting the critical role of hygiene and dam vaccination in prevention. Parturition on the farm should be conducted in a sterile environment, using sterile equipment and materials. Following parturition, the umbilicus and any other sustained injuries should be thoroughly cleaned, disinfected, and treated appropriately to avoid occurrences of tetanus infection. Routine vaccination is highly important; farmers should be informed about its importance to prevent future cases of this disease. Handling of neonatal tetanus cases presented or diagnosed in veterinary clinics can be reported in more adequate ways to minimize losses.

Declarations

Acknowledgments

The authors appreciated the efforts of the technical staff and clinical students of the large animal clinic, University of Jos, Veterinary Teaching Hospital, Jos, Plateau State, Nigeria.

Availability of data and materials

Data supporting the present study are included within the article and are available from the corresponding author upon reasonable request.

Authors' contributions

The concept of the present manuscript, clinical handling of the case, and literature search were conducted by Opaluwa Kuzayed Imaben Grace and Ayopelumi Tunde-Dada. Karaye Gloria Pisha, Andara Mamani Joseph, and Makchit Galadima were involved in clinical handling of the case and investigations. The original draft was written by Opaluwa Kuzayed Imaben Grace and Ayopelumi Tunde-Dada and reviewed by Karaye Gloria Pisha, Andara Mamani Joseph, Terzungwe Tughgba, and Makchit Galadima. All authors have read and affirmed the final edition of the manuscript.

Competing interests

All authors have declared no competing interests.

Ethical considerations

The authors declared that this original case report has not been published or submitted elsewhere. Authors hereby declare that no generative AI technologies such as Large Language Models (ChatGPT, COPILOT) and text -to-image generators have been used during the writing or editing of this manuscript. All ethical challenges, including plagiarism and consent to publish, have all been considered.

Funding

The study was not funded by any organization.

References

1. Gupta DK, Swaran S, Shukriti S, Bansal BK, and Uppal SK. Occurrence of tetanus in cows with recent parturition – study of two cases. Haryana Vet. 2018; 57(2): 239-240. Available at: https://www.luvas.edu.in/haryana-veterinarian/download/harvet2018-dec/31.pdf
2. Njuguna HN, Yusuf N, Raza AA, Ahmed B, and Tohme RA. Progress toward maternal and neonatal tetanus elimination — worldwide, 2000-2018. MMWR Morb Mortal Wkly Rep. 2020; 69(17): 515-520. Available at: https://www.cdc.gov/mmwr/volumes/69/wr/mm6917a2.htm https://www.cdc.gov/mmwr/volumes/69/wr/mm6917a2.htm
3. Murray PR, Rosenthal KS, and Pfaller MA. Medical microbiology. 9th ed.

Elsevier, 2020. p. 360-363. Available at: https://shop.elsevier.com/books/medical-microbiology/murray/978-0-323-67322-8
4. Popoff MR. Tetanus in animals. J Vet Diag Invest. 2020: 32(2): 184-191. DOI: 10.1177/1040638720906814
5. George Ek, Jesus OD, Tobin EH, and Vivekanandan R. Tetanus (*Clostridium tetani* Infection). StatPearls. Treasure Island (FL): StatPearls Publishing; 2025. Available at: https://www.ncbi.nlm.nih.gov/books/NBK482484/
6. Hassel B. Tetanus: Pathophysiology, treatment, and the possibility of using botulinum toxin against tetanus-induced rigidity and spasms. Toxins. 2013; 5(1): 73-83. DOI: 10.3390/toxins5010073
7. Upadhyay SR, Hussain K, and Singh R. Bovine neonatal tetanus: A case report. Buffalo Bull. 2013; 32(1): 18-20. https://www.bing.com/search?pglt=43&q=Upadhyay+SR%2C+Hussain+K%2C+Singh+R.+Bovine+neonatal+tetanus%3A+A+case+report.+Buffalo+Bulletin.+2013%3B+32(1)%3A18-20.&cvid=4e4e528bb44b4bae97bc8e64100ab30d&gs_lcrp=EgRlZGdlKgYIABBFGDkyBggAEEUYOTIHCAEQ6wcYQNIBCDM3MjZqMGoxqAIGsAIB&FORM=ANSPA1&PC=U531
8. Sprott KR. Generalized tetanus in a Labrador retriever. Can Vet J. 2008; 49(12): 1221-1223. Available at: https://pmc.ncbi.nlm.nih.gov/articles/PMC2583421/
9. Tizzard IR. In: Sheep and goat vaccines. Vaccines for veterinarians. Elsevier, 2021. p. 151-161.e1. DOI: 10.1016/B978-0-323-68299-2.00026-5
10. Banwo OG, Idris I, Bolaji-Alabi FB, and Olaogun S. A case report of tetanus in a West African dwarf ram lamb. Niger Vet J. 2025; 46(3): 110-118. DOI: 10.4314/nvj.v46i3.9
11. Quinn PJ, Markey BK, Leonard FC, FitzPatrick ES, Fanning S, and Hartigan PJ. Veterinary microbiology and microbial disease. 2nd ed. Wiley-Blackwell, 2011. Chapter two. p. 16-18. Available at: https://www.wiley-vch.de/en/areas-interest/medicine-health-care/veterinary-microbiology-andmicrobial-disease-978-1-4051-5823-7
12. Altuğ N, Yüksek N, Karasu A, Ilhan F, Ceylan E, Ekin IH, et al. Diagnosis and treatment of umbilical cord-derived tetanus in neonatal calves. Turk J Vet Anim Sci. 2017; 41(3): 317-322. DOI: 10.3906/vet-1604-28
13. Lotfollahzadeh S, Heydari M, Mohebbi MR, and Hashemian M. Tetanus outbreak in a sheep flock due to ear tagging. Vet Med Sci. 2019; 5(2): 146-150. DOI: 10.1002/vms3.139
14. Siddiqui MF, Shaikh SR, Sakhare MP, Digraskar SU, Borikar ST, Syed AM, et al. Successful therapeutic management of neonatal tetanus in goat. Int J Chem Stud. 2019; 7(3): 151-152. Available at: https://www.chemijournal.com/archives/?year=2019&vol=7&issue=3&ArticleId=5512&si=false
15. Brooks W. Vaccine allergic reactions in dogs and cats. Veterinary partner. 2001. Available at: https://veterinarypartner.vin.com/default.aspx?pid=19239&catId=102903&id=4951409
16. Rashid I, Ahmad J, Sial AR, Muhammad G, and Sadqib M. Tetanus in a surgically castrated Beetal buck: A case report. Matrix Sci Pharma. 2017; 1(2): 25-26. Available at: https://matrixscpharma.com/archives/2msp2017/2msp2017-25-26.pdf
17. Constable PD, Hinchcliff KW, Done SH, and Grunberg W. Veterinary medicine: A textbook of the diseases of cattle, horses, sheep, pigs and goats. 11th ed. China: Saunders Elsevier's Missouri Publications; 2017. p. 185-189. Available at: https://shop.elsevier.com/books/veterinary-medicine/constable/978-0-7020-5246-0
18. Samal P, Lakshmi K, and Padmaja K. Successful therapeutic management of tetanus in a non - descriptive goat. Pharma Innov J. 2017; 6(6): 202-203. Available at: https://www.thepharmajournal.com/archives/?year=2017&vol=6&issue=6&ArticleId=1096
19. Bardoe D, Hayford D, Owusu-Mensah I, and Bio RB. Maternal immunisation towards prevention of neonatal tetanus: Insight from a cross-sectional study in Pru East Municipality, Ghana. BMJ Public Health. 2025; 3(2): e003200. DOI: 10.1136/bmjph-2025-003200
20. Jansen BC, and Knoetze PC. The immune response of horses to tetanus toxoid. Onderstepoort J Vet Res. 1979, 46(4): 211-216. Available at: https://repository.up.ac.za/items/1c650078-9883-4fb5-a171-5218a205c410?utm_source=
21. Matthew E. Use of tetanus vaccine in veterinary treatment. J Vaccines Vaccin. 2023; 14(2): 1000514. Available at: https://www.walshmedicalmedia.com/open-access/use-of-tetanus-vaccine-in-veterinary-treatment-118503.html
22. Dhir SK, Dewan P, and Gupta P. Maternal and neonatal tetanus elimination: Where are we now? Res Rep Trop Med. 2021; 12: 247-261. DOI: 10.2147/RRTM.S201989
23. Onyeje CK, and Onyeje BT. Successful management of neonatal tetanus with autonomic manifestations at a referral hospital in Nigeria: A case report. BMC Pediatr. 2025; 25: 846. DOI: 10.1186/s12887-025-06253-9
24. Ganesh M, Sheikh NK, Shah P, Mehetre G, Dharne MS, and Nagoba BS. Detection of *Clostridium tetani* in human clinical samples using tetX specific primers targeting the neurotoxin. J Infec Public Health. 2016; 9(1): 105-109. DOI: 10.1016/j.jiph.2015.06.014
25. Esmaeli H, Hamedi M, and Mohammadpour-Baltork B. An outbreak of tetanus in a sheep following insanitary ear tagging in Mazandaran Province, Iran. J Med Bacteriol. 2021; 10(3,4): 28-32. Available at: https://www.sid.ir/paper/1016348/en#downloadbottom
26. Acke E, Jones BR, Breathnach R, McAllister H, and Mooney CT. Tetanus in the dog: Review and a case report of concurrent tetanus with hiatal hernia. Ir Vet J. 2004; 57(10): 593. DOI: 10.1186/2046-0481-57-10-593