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## TETANUS IN A MALAYAN TAPIR (*Tapirus indicus*)

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### SUMMARY

A female adult Malayan Tapir was presented with clinical signs of stiff gait, spasm of the snout, difficulty in food prehension, mental depression, apparent blindness and ulcerations of the gingiva. Based on classical features, a diagnosis of tetanus was made. Treatment was initiated with 0.5 mL of tetanus toxoid (TT vaccine, 10Lf/dose) administered intramuscularly. All clinical signs were observed subsided within three days post treatment.

Keywords: Malayan tapir, Tetanus, Tetanus toxoid

### INTRODUCTION

Tetanus is an infection caused by a gram positive, anaerobic bacillus, *Clostridium tetani* (Springer et. al., 2009). The potent neurotoxin (tetanospasmin) produced by this organism caused nervous and musculoskeletal system abnormalities manifested by trismus/lockjaw, dysphagia, opisthotonos, or rigidity and spasm of the respiratory, laryngeal, and abdominal muscle. Generalized rigidity and muscle spasm may exacerbate by light, touching and noise (Springer et. al., 2009; Hassels, 2013). Death may ensue due to respiratory failure due to laryngospasm or respiratory muscle paralysis. The spore-forming bacillus is commonly found in soil (Bleck, 2005). Incubation period varies from one to several weeks but averaged 10 - 14 days.

Tetanus cases had been reported in few species of wildlife such as Eastern Grey Squirrel (*Sciurus carolinensis*) (Wobeser, 1969) and hippopotamus (*Hippopotamus amphibius capensis*) (Vos and De Klerk, 1980). Clinical signs showed in affected hippo differ from the classical picture in domestic herbivores where the front leg is inclined backwards instead of forward. In addition, cases of tetanus had been reported in rhinoceros in 1979 and 2003 (Miller, 2003) but no report was found on tetanus infection in tapir. A possible tetanus cases in an Asian elephant was made based on clinical signs and presence of deep wound in the elephant's leg (Burke, 1975). In India, tetanus is listed as one of less frequent observed condition based on retrospective study of zoo/wild animals (Sharma et. al., 2014). High mortality rates are reported between 77

– 100% in non- human primates (Rawlins and Kessler, 1982).

### CASE REPORT

A five-year old female Malayan tapir, weighing 250 kg was reported by a keeper to be inappetent, having a rigid head and restless for a week. The tapir had lacerations on chin, head and shoulder. Physical examination revealed stiff gait, spasm of the snout, mental depression, apparent blindness (bumping into things while walking) and ulcerated gingiva. When forced, the animal was able to swallow food but mastication was very slow and unable to grasp food independently. Extension of neck (Figure 1) and rigidity of leg and abdominal muscle were observed during two tetanus episodes.



Figure 1. Tapir showing general muscular rigidity manifested by extension of neck and forelimbs.

Based on clinical signs, a treatment using tetanus toxoid (TT) (TT vaccine 10Lf/dose, PT Bio Farma,

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Indonesia) at a dose of 0.5 mL was given intramuscularly. In addition, 40 mg of Xylazine HCl (Ilium Xylazil-100, Troy Animal Healthcare, Australia), was given intramuscularly to relieve spasm. Procaine penicillin G (Norocillin, Norbrook Laboratories Limited, Northern Ireland), at 10 mg/kg and Dexamethasone (Dexavet 0.5%, Range Pharma, Malaysia) at 0.2 mg/kg were also administered. Within 10 hours post TT injection, no episodes of tetanus were observed and all clinical signs subsided. The tapir became more alert and was able to grasp food independently. Appetite was normal within three days. As positive results were observed after the first toxoid injection, antibiotic and anti-inflammatory treatment were continued for another one week. A second dose of TT was injected after two weeks. Full body re-examination revealed a deep wound with necrotic tissues on the fourth nail of the left front leg.

## DISCUSSION

In the above case, the observation of classical features of tetanus, the presence of a deep necrotic wound and the positive response to TT treatment support the diagnosis of tetanus. Confirmed diagnosis of tetanus is based on the demonstration of thin bacilli with large terminal spores through bacterial culture of infected wound or via the toxins effect on the inoculated mouse (Kessler & Martinez, 1979). However, an attempt to confirm the diagnosis in the laboratory are challenging due to few factors such as failure of early detection of site of infection/penetrating wound as wound itself may be minor or healed and difficulty to recover bacteria from infected wounds.

The organism is viable for years in soil and direct inoculation of spores into acute, penetrating wound ensue the infection (Farrar et. al., 2000). Wound that is contaminated with soil, dirt, faeces and appear as punctures, avulsions, crushing and burns should be seen as tetanus-prone wounds (Talan et. al., 2004; CDC, 2006). In this case, the animal was kept in enclosure with exercise yard, thus direct contact with soil increasing the susceptibility of tetanus infection (Springer et. al., 2009).

The principal of tetanus treatment is elimination of the *Clostridium tetani* by using antibiotic therapy. Recommended therapy is using intravenous metronidazole, 500 mg three times daily or penicillin, 100,000 – 200,000 IU/kg/day for seven to ten days (Ganesh et. al., 2004; Campbell et. al., 2009). The administration of antitoxin at doses of 500 IU to 3000 IU is required to inactivate tetanus toxin that is still free/not binding at the nerve terminal (Okoromah et. al., 2004). Treatment of musculoskeletal sign is very important as muscle rigidity and spasm of respiratory muscle may lead to death (Bleck, 2005; Amare et. al., 2012; Hassel, 2013). Other than alpha-agonist, benzodiazepines can be used as muscle relaxant (Okoromah et al., 2004).

Prevention of tetanus infection is achieved by vaccination with formaldehyde-inactivated tetanus toxin (toxoid). Tetanus prophylaxis is very effective and were recommended to be done routinely in this species (Ramsay & Zainuddin, 1993; Blood et. al., 1968; Miller

et. al., 1966). Proper husbandry management consists of good hygiene and safe enclosure to minimise injury is of vital importance. In any case of deep wound penetration, the administration of tetanus toxoid is highly recommended (Fowler & Mikota, 2006 and Sentilkumar et al., 2014).

## CONCLUSION

In summary, tetanus in tapir showed similar typical clinical features recorded in other wildlife. With early detection and proper treatment instituted, prognosis is good towards complete recovery.

## CONFLICT OF INTEREST

None of the authors have any potential conflicts of interest to declare. All authors are equally contributed to this work.

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## REFERENCES

- Amare, A., Melkamu, Y., Mekonnen, D. (2012): Tetanus in adults: Clinical presentation, treatment and predictors of mortality in a tertiary hospital in Ethiopia. *Journal of Neurological Sciences*. 317: 62 – 65.
- Bleck, T.P. (2005): *Clostridium tetani* (Tetanus). In *Principles and Practices of Infectious Diseases*, 6<sup>th</sup> ed.; Mandell G.L., Bennett J.E., Dolin R., Eds.; Amsterdam, The Netherlands; pp. 2817 - 2822.
- Blood, D.C. and Henderson, J.A. (1968): *Veterinary Medicine*, 3<sup>rd</sup> edition. Williams and Wilkins. Baltimore, Maryland.
- Burke, T.J. (1975): Probable tetanus in Asian Elephant. *The Journal of Zoo Animal Medicine*. 6(1): 22-24.
- Campbell, J.I., Lam, T.M., Huyunh, T.L., To, S.D., Tran, T.T., Nguyen, V.M., Le, T.S., Nguyen, V.C., Parry, C., Farrar, J.J., Tran, T.H., Baker, S. (2009): Microbiologic characterization and antimicrobial susceptibility of *Clostridium tetani* isolated from wounds of patients with clinically diagnosed tetanus. *The American Society of Tropical Medicine and Hygiene*. 80: 827 – 831.
- Centers for Disease Control (CDC) and Prevention. Preventing tetanus, diphtheria, and pertussis among adults: use of tetanus toxoid, reduced diphtheria toxoid and acellular pertussis vaccine. (2006): *MMWR Recommendation and Reports* 55: 1 – 33.
- Farrar, J.J., L.M. Yen, T. Cook, N. Fairweather, N. Binh, J. Parry, and C.M. Parry. (2000): Neurological aspects of tropical disease: tetanus. *Journal of Neurology, Neurosurgery, and Psychiatry* 69: 292 – 301.
- Fowler, M.E. and Mikota, S. (2006): *Medicine and Surgery of elephants*. 1<sup>st</sup> Ed, Blackwell Pub., USA: 119.
- Ganesh, K., A.V., Kothari, V.M., Krishnan, A., Karnad, D.R. (2004): Benzathine penicillin, metronidazole and benzyl penicillin in the treatment of tetanus: A randomized, controlled trial. *Annals of Tropical Medicine and Parasitology*. 98, 59 – 63.
- Hassel, B. (2013): Tetanus Pathophysiology, treatment, and the possibility of using botulinum toxin against tetanus-induced rigidity and spasms. *Toxins*. 5: 73-83. doi:10.3390/toxins5010073.

- Kessler, M.J. and Martinez, H.S. (1979): Treatment of tetanus in rhesus monkeys (*Macaca mulatta*). *The Journal of Zoo Animal Medicine*. 10:119-122.
- Miller, R.E. (2003): Rhinocerotidae (Rhinoceroses). In Fowler ME, Miller RE, editors: *Zoo and wild animal medicine*, ed 5, St. Louis, MO, Saunders.
- Miller, E.S. (1966): Tetanus in *Principles of Internal Medicine*. 5<sup>th</sup> Edition. Ed. By T.R. Harrison, et al. McGraw-Hill Book Co., New York.
- Okoromah, C.N., Lesi, F.E. (2004): Diazepam for treating tetanus. *Cochrane Database Syst. Rev*.
- Ramsay, E.C. and Zainuddin, Z.Z. (1993): Infectious Diseases of the Rhinoceros and Tapir. 459-466.
- Rawlins, R.G. and Kessler, M.J. (1982). A five-year study of tetanus in the Cayo Santiago rhesus monkey colony; behavioral description and epizootology. *American Journal of Primatology*. 3: 23-39.
- Senthilkumar, K., Senthilkumar, A. and Jayathangaraj, M.G. (2014): Clinical management of chronic abscess in an Asian elephant (*Elephas maximus*). *Journal of Advanced Veterinary and Animal Research*. 1(2): 73-74.
- Sharma, A. K., Nayakwadi, S., Chandratre, G. A., Saini, M., Das, A., Raut, S. S., Swarup D., Somvanshi, R. (2014): Prevalence of Pathological Conditions in Zoo/Wild Animals in India: A Retrospective Study Based on Necropsy. *Proceedings of the National Academy of Sciences India Section B - Biological Sciences*.
- Springer, D. A., Phillippi-Falkenstein, K., & Smith, G. (2009): Retrospective Analysis of Wound Characteristics and Tetanus Development in Captive Macaques. *Journal of Zoo and Wildlife Medicine*. 40(1): 95-102.
- Talan, D.A., F.M. Abrahamian, G.J. Moran, W. R. Mower, K. Alagappan, B.R. Tiffany, C.V. Pollack, M.T. Steele, L.M. Dunbar, M.D. Gajani, R.S. Weyant, and S.M. Ostroff. (2004): Tetanus immunity and physician compliance with tetanus prophylaxis practices among emergency department patients presenting with wounds. *Annals of Emergency Medicine*. 43: 305 – 314.
- Vos, V.D. and De Klerk, B.D. (1980): Tetanus in a free-living hippotamus (*Hippotamus amphibious capensis*) from the Kruger National Park. *Koedoe* 23: 171-175.
- Wobeser, G. (1969): Tetanus in a Grey Squirrel. *Bull. Wildlife Disease Association*. 5: 18-19.