

International Journal for Pharmaceutical

Research Scholars (IJPRS)



ISSN No: 2277 - 7873

CASE STUDY

A Case Series on Tetanus

 Vijay Jagadeesh Kakimani^{1*}, T. Hari keerthana¹, Kali. chandra sekhar², N. Surendra Reddy³, D. Ranganayakulu⁴
¹Pharm D Intern, Department of General Medicine, SVRRGGH, Tirupati
²Assistant Professor, Department of General Medicine, SVRRGGH, Tirupati,
³Assistant Professor, Department of Pharmacy Practice,
⁴Principal, Sri Padmavathi School of Pharmacy, Tiruchanoor, Tirupati – 517503, India Manuscript No: IJPRS/V6/I2/00053, Received On: 27/05/2017, Accepted On: 05/06/2017

ABSTRACT

Tetanus is a neurotoxin-mediated disease characterized by a progressive spastic paralysis of multiple muscle groups. The toxin is transported through the axons and reaches the areas such as the spinal cord or brainstem. Muscle rigidity and spasms are the clinical hallmarks of tetanus and opisthotonus position of the abdomen. Complications of tetanus are broken bones, pulmonary embolism, and even death. According to WHO guidelines the treatment should include immunotherapy, antibiotic treatment, muscle spasm control, respiratory control, adequate fluids, and nutrition. This article explains about the cases which are diagnosed with tetanus with same cause and similar symptomology.

KEYWORDS

Tetanus, Muscle stiffness, Opisthotonus posture, Tetglob.

INTRODUCTION

Tetanus is a neurotoxin-mediated disease characterized by a progressive spastic paralysis of multiple muscle groups. The Tetanospasmin is a neurotoxin that disrupts neurotransmitter release in inhibitory neurons leading to muscle rigidity spasms1. peripheral and Tetanospasmin is produced by the obligate anaerobic species Clostridium tetani, of which spores are well distributed in the its environment. This may cause unavoidable risk of tetanus infection after contamination of the wound. Tetanus has become rare in developed countries because of implementation of primary immunization series, but infants who are not immunized on religious base are still at risk2.

*Address for Correspondence: Vijay Jagadeesh Kakimani, Department of Pharmacy Practice, Sri Padmavathi School of Pharmacy, Tiruchanoor, Tirupati – 517503. E mail ID: ijprs.publication@gmail.com

Tetanus mainly affects skeletal muscle which is a type of striated muscle, generally involved in voluntary movements and the other type of striated muscle are cardiac, or heart muscle cannot be tetanized because of its intrinsic electrical properties1. At first tetanus toxin binds to peripheral nerve terminals and then it is transported within the axon and across synaptic junctions until it reaches the central nervous system. There it attaches to gangliosides very quickly at the presynaptic inhibitory motor nerve endings and is taken up into the axon by endocytosis. The significant effect of the toxin to block the release of inhibitory is neurotransmitters like glycine and gammaaminobutyric acid (GABA) across the synaptic cleft, which is required to check the nerve impulse. If nerve impulses cannot be checked by typical inhibitory mechanisms, then generalized muscular spasms which are characteristic of tetanus are produced3.

Muscle rigidity and spasms are the clinical hallmarks of tetanus e.g. trismus (lockjaw) and opisthotonus position of abdomen4. Tetanus can present in four clinical patterns-generalized, local, cephalic and neonatal. Mainly, the onset of tetanus infection is always not associated with the clinical signs which are enlisted above. Tetanus presenting with only oropharyngeal symptoms can be misdiagnosed as a common oropharyngeal infection. Nevertheless. unnoticed tetanus may quickly progress into a critical condition with severe muscle spasms, autonomic dysfunction, respiratory failure and sometimes even death5. Patients with an unsure clinical signs of tetanus should receive local tetanus immunoglobulins, wound care. antimicrobials and therefore should be transferred to a specialized intensive care unit without any delay. In this case, we report a female child who presented to the hospital in critical condition and was admitted to emergency care and on the seventh day she died with respiratory failure.

CASE STUDY: 1

A 13 years old Female patient was brought by her parents to the general medicine Female Department of SVRRGGH, Tirupati with the complaint of pain & spasm of cervical muscles which is associated with restriction of movement at cervical region and inability to open mouth from that morning. Patient's past medical history revealed that she had trauma, headache in the occipital region, fever which is insidious in onset, abdominal pain, loose motions, bowel & bladder disturbances. Her laboratory data include Blood urea- 26mg/dl, Serum creatinine- 0.7mg/dl, Serum electrolytes: Na+ - 155mmol/l, K+ - 4.5mmol/l, Cl- -103mmol/l, Hb- 10.5. Based on the complaints, past medical history and of the patient she was diagnosed as "TETANUS." On the first day of admission, she was treated with inj. Tetanus immunoglobulin 3000IU IM, inj. Augmentin 1.2g IV BD, inj. metrogyl 400mg/100ml IV TID, inj. 25% dextrose IV TID, inj. Midazolam 8mg continuous IV drip, inj. Optineurin 1amp in 1NS IV. On the second day, the patient was in opisthotonus posture, and her pulse rate was

110 bpm. On examination her abdomen was rigid and initial, her partial pressure was 80% with room air and 90% with oxygen 10 l/min. After 2hours partial pressure was decreased to 67% with room air and treatment given was same except midazolam as they increased the dose of midazolam to 10 mg and then spasms controlled with 2mg/hr midazolam. On day three the patient was unconscious, on examination, her pulse rate was 130 bpm, and the partial pressure was found to be 70% with oxygen so, patient intubated with 7.0 size endotracheal tube which is fixed at 18 cm after confirming bilateral air entry equal on both sides. The treatment given was same as day two, and they added inj.vecuronium 2mg IV OD. On day four, five and, six the patient was on mechanical ventilation and examination she had tachycardia, rigid abdomen and spasm. Treatment given was same except inj. vecuronium. Later on day seven.



The patient was unable to withstand on mechanical ventilation and died due to respiratory failure.

CASE STUDY: 2

A 45 years old Male patient was brought to the general medicine Male Department of SVRRGGH, Tirupati with the complaints of Stiffness of the both upper limb & lower limb associated with stiffness while opening mouth since 5days. The patient was unable to open mouth and had difficulty in chewing and swallowing. He can swallow liquid but had difficulty in swallowing solid food. Patient's past medical history reveals that he had epilepsy and was on T.GARDENAL 60mg OD and also had a trauma 1month back. His laboratory data include Blood urea- 35mg/dl, Serum creatinine- 1.0mg/dl, Serum electrolytes: Na+ - 147mmol/l, K+ - 4.1mmol/l, Cl- -99mmol/l. Hb- 9.7. Based on the complaints and past medical history, the patient was diagnosed as "TETANUS." He was treated with inj. tetglob 4000 iu iv stat, I. metrogyl 500mg iv qid, I. diazepam 1 amp in 100 ml NS, T. liofen 10mg po tid, I. pan top 40mg iv od, I. optineuronv1amp in 100ml NS iv od, iv.fluids 5% dextrose & RL 1 unit @ 100ml/hr. The patient had improved symptoms but not resolved fully, and later the patient was discharged.

DISCUSSION

Tetanus is caused by Clostridium tetani which are a large spore forming anaerobic gram-positive bacillus. It is club-shaped bacteria which have a spore at one end. The spores are found naturally in soil, animal feces, and manure(Rizwan). Spores are entered into the body through an injury that causes a crack in skin structure such as a laceration, puncture or burn. Once C. tetani spores are entered into the body, they convert to their vegetative forms and multiply in the tissues at the site of injury8,10. Two toxins are produced by this anaerobic bacteria, one is tetanolysin, and the other is tetanospasmin. Tetanospasmin can cause characteristic features of tetanus, whereas the cause of tetanolysin is unknown(Rizwan). The tetanospasmin targets vesicle-associated membrane protein (VAMP) that are involved in neurotransmitter release from nerve endings.

The toxin is transported through the axons and reaches the areas such as the spinal cord or brainstem. Once the toxin is taken up by inhibitory GABAergic or glycinergic neurons or both within the CNS, it inhibits release of GABA and glycine8,9. This leads to rigidity and spasms in hyperactive muscles8.

Both patients reported uncertain vaccination status, and the second patient selfreported a history of not receiving any vaccinations within the previous ten years. The tetanus symptomology development of following acute injury is not well documented. Signs and symptoms of these two patients were similar which include difficulty in opening mouth and swallowing. The second patient had limb stiffness whereas the first patient was in the opisthotonus posture. In the both cases trauma is the primary cause of tetanus. Epilepsy can worsen the condition of tetanus as in the second patient.

The treatment given to the patients was according to WHO guidelines which include immunotherapy, antibiotic treatment, muscle spasm control, respiratory control, adequate fluids, and nutrition6. The second patient had improved symptoms with the treatment but not recovered completely, but in the case of the first patient she experienced respiratory failure which is the most common cause of death or lack of oxygen may also induce cardiac arrest and death. Once tetanus toxin has bonded to the nerve endings it is not possible to remove. Therefore, complete recovery from a tetanus infection requires new nerve endings to grow, that can take up to several months which can lead to complications to develop. The main complications of tetanus are broken bones, pulmonary embolism, and even death7.

CONCLUSION

Prior recognition and prompt initiation of advanced critical care are mandatory to prevent rapid clinical failure. Therefore, the differential diagnosis of non-immunized children with an acute onset of muscle stiffness and trismus should always include generalized tetanus. In both the cases, the treatment was given was appropriate according to WHO guidelines but in case one the patient was not able to improve the condition even though the given treatment was prompt. In the second case, the patient had a history of epilepsy which can worsen the condition. Therefore, the patient should be taken care to stop seizure episodes. Hence, tetanus cannot be cured completely but can be managed.

REFERENCES

- De Jong, P. R., de Heer-Groen, T., Schröder, C. H., & Jansen, N. J. G. (2009). Generalized tetanus in a 4-year old boy presenting with dysphagia and trismus: a case report. *Cases journal*, 2(1), 7003.
- Roper, M. H., Vandelaer, J. H., & Gasse, F. L. (2007). Maternal and neonatal tetanus. *The Lancet*, *370*(9603), 1947-1959.
- 3. https://www.omicsonline.org/switzerland/te tanus-peer-reviewed-pdf-ppt-articles
- Cook, T. M., Protheroe, R. T., & Handel, J. M. (2001). Tetanus: a review of the literature. *British Journal of Anaesthesia*, 87(3), 477-487.
- Esslinger, P., Kistler, W., & Berger, T. M. (2003). Severe autonomic dysfunction in an 11-year-old girl with generalised tetanus. *European journal of pediatric surgery*, 13(03), 209-212.
- 6. http://www.who.int/diseasecontrol_emergen cies/who_hse_gar_dce_2010_en.**pdf**.
- http://www.mayoclinic.org/diseasesconditions/tetanus/symptoms-causes/dxc-20200458.
- John, D. H., Eric, W., Jelyn, M. and Gina, M., R. (2016). Tetanus: A Case Report following an Upper Extremity Injury: Hill et al. Clin Med Rev Case Rep, 3:090 ISSN:

2378-3656.

- 9. Hassel, B. (2013). Tetanus: pathophysiology, treatment, and the possibility of using botulinum toxin against tetanus-induced rigidity and spasms. *Toxins*, *5*(1), 73-83.
- Parker, J. (2006). Managing tetanus: Janet Parker describes the nature and treatment of tetanus in emergency care settings. *Emergency Nurse*, 14(4), 14-17.

HOW TO CITE THIS ARTICLE

Vijay, J. K., Hari, k. T., Kali, c. Surendra, S., N. **R**., Ranganayakulu, D. (2017). A Case Series on Tetanus. International Journal for Pharmaceutical Research Scholars (IJPRS), 6(2), 167 -170.