International Journal of Medical and Health Research
ISSN: 2454-9142
Received: 16-08-2019; Accepted: 21-09-2019
www.medicalsciencejournal.com
Volume 5; Issue 10; October 2019; Page No. 144-146

Study on clinical profile of adult tetanus patients at infectious disease hospital, N.M.C.H, Agamkuan, Patna

Dr. Shachindra Chaudhary[1], Dr. Kaushal Kumar[2*]

[1] Associate Professor, Department of Medicine, Nalanda Medical College and Hospital, Agam Kuan, Patna, Bihar, India

[2] Senior Resident, Department Of Medicine, Nalanda Medical College and Hospital, Agam Kuan, Patna, Bihar, India

[*] Corresponding Author: Dr. Kaushal Kumar

Abstract

Introduction: Tetanus is endemic and it remains a major public health problem even today, with a high morbidity and mortality.

Aims and Objectives: To study socio-demographic characteristics, clinical presentations, complications, treatment and the outcome of the adult tetanus patients admitted to the Infectious Diseases Hospital, N.M.C.H., Agamkuan, Patna.

Materials and Methods: The data of all the patients of tetanus who were admitted from February 2019 to July 2019, were collected, compiled and analysed.

Source of Data: During this period all tetanus patients who were admitted to the Infectious Diseases Hospital, N.M.C.H., Agamkuan, Patna were included in this study.

Type of study: Prospective study with detail history taking and clinical examination.

Statistical Analysis: Statistical analysis was done by using MS Excel 2007

Results: Out of 50 cases of tetanus, 37 were males and 13 were females. Most common presenting symptoms were trismus, neck stiffness, body spasms/stiffness and dysphagia. Majority of patients belonged to low socio-economic group. The ages of the patients and the presence of complications had a statistically significant relationship with respect to the outcome (survival versus death).

Conclusion: Tetanus is a vaccine preventable illness and effective immunization, proper wound management & awareness in the society is needed. Its prevalence is high among lower socio economic groups with high morbidity and mortality among extremes of age.

Keywords: tetanus, clinical presentation, treatment outcome, tetanus complications, tetanus mortality in india

Introduction

The word 'tetanus' comes from the greek word, *tetanos*, which is derived from *teinein*, which means, to stretch. It is caused by a spore forming bacterium, *Clostridium tetani*, & it is an acute and often a fatal disease that is manifested by skeletal muscle spasm and autonomic disturbance characterised by a generalized muscle rigidity and convulsive spasms [1, 2].

The *C.tetani* spores are found in soil and in animal and human faeces & contamination of wounds with its spores result in germination and toxin production like tetanospasmin & tetanolysin. The released toxin binds to the peripheral motor neuron terminals, enters the axon, and it is transported to the nerve-cell body in the brain stem and the spinal cord by a retrograde intraneuronal transport. The toxin is translocated across the synapse to the GABA-ergic presynaptic inhibitory interneuron terminals, where it blocks the release of neurotansmitters glycine and gamma aminobutyric acid (GABA) from the vesicles.

The blocking of the inhibitory neurotransmitter release by tetanospasmin, results in increase of resting firing rate of the alpha motor neuron, thus producing rigidity. The loss of inhibition of the preganglionic sympathetic neurons may produce a sympathetic hyperactivity and high circulating levels of catecholamines [3, 4]. Role of tetanolysin is unknown, but it is believed to contribute to pathogenesis of tetanus.

The muscle tone is increased, thus producing the characteristic trismus, risus sardonicus, and opisthotonus. The spasms typically develop one to four days after the initial symptoms [4]. Tetanus is a non-communicable disease and it is not transmitted from person to person [2].

The global incidence of tetanus is estimated to be one million cases annually, with a case fatality rate which ranges from 6% to 72%, depending on the availability of well-equipped intensive care units [5]. In the developed countries, its incidence has genuinely declined since 1940, mainly due to the wide spread vaccine coverage [1].

In India, tetanus is endemic and it remains a public health problem even today. Few studies which were done in India have revealed the prevalence of tetanus and the mortality which is caused by tetanus to be high [6, 7, 8]. The present study was a maiden attempt in this part of the country to know the socio-demographic characteristics and the clinical profile, as well as the outcome of the tetanus patients who were admitted at the Infectious Diseases Hospital, NMCH, Agamkuan Patna.

Aims and Objectives

To study socio-demographic characteristics, clinical presentations, complications, treatment and outcome of the adult tetanus patients admitted to the Infectious Diseases

Hospital, N.M.C.H., Agamkuan, Patna.

Materials and Methods

Study setting and Design

This was a prospective study conducted after approval from Institutional Ethics Committee, on Adult tetanus patients who presented to the Infectious Disease Hospital, NMCH, Agamkuan, Patna between February 2019 and July 2019. This is a referral hospital for infectious diseases run by Government of Bihar. The hospital caters to the people of Patna and neighbouring areas. The consultation, ward charges and drugs are provided free of cost. Hospital has 30 beds, which includes isolation wards for tetanus patients.

Study Subjects

The study included all the patients who were diagnosed clinically to be suffering from tetanus. Details of the demographic data, clinical presentations, management, related complications, duration of the hospital stay, the pre-existing conditions and the outcome were collected and analysed.

Statistical Analysis

Statistical analysis was done by using MS Excel 2007.

Results

The Demographic Profile

A total of 50 patients were studied during the period of February 2019 to July 2019. 18 (36%) patients were above 40 years of age & 11 (22%) were below the age of 10 years. 37(74%) were males and 13(26%) were females, with a male to female ratio of 2.8: 1.

Portals of the Entry and the Type of Injury

Acute injuries like pricks, puncture wounds and lacerations were the most common portals of entry in 27 (54%) cases and a history of a previous wound was present in 9 (18%) patients. The other portals of entry included road traffic accidents (RTA), bites, burns, fissures of the foot and post-surgical wounds. The portals of entry were not identified in 11 (22%) patients. The most common anatomical site of the injury was the lower limb i.e. in 34 (68 %) patients.

Clinical Profile

All the 50 patients had generalized tetanus. About 48. % of the patients who survived, stayed in the hospital for over 3 weeks or more. The most common presenting symptoms were trismus - 48 (96%), neck stiffness- 45 (90%), body spasms and stiffness -37(74%) and dysphagia -23 (46%).

Treatment

All the patients were managed with the tetanus toxoid (0.5ml I.M.), human tetanus immunoglobulin (3000 IU IM), antibiotic therapy [penicillin (2 million Units I.M. every 6 hours) or metronidazole (500 mg I.V. every 6 hours)] and muscle relaxants [diazepam (5-10 mg I.V. q 6 hourly) or methocarbamol (1 gm q 8 hourly), lorazepam (4 mg iv sos) depending on the severity, wound care and throat suction with oxygen through a mask, whenever it was required. Supportive therapy such as fluids and calorie intake, prevention of gastric ulcers and prevention of bed sores were provided to all the patients.

Outcome

Of the total 50 patients, 31 (62%) survived. The case fatality rate was 38%. Of the 18 patients who were above the age of 40 years, 8 (44.4%) died and out of the 11 patients below the age of 10 years, 7 (63.3%) died. Rest out of 21 (42%) patients between 11-39 years only 4 (19%) died. So there was a statistically significant relationship with respect to the age and outcomes (survival and death) [Table-1].

Table 1: Distribution of tetanus patient's outcome according to various parameters

Variables	Total (n)	Outcome of treatment	
		Survive [n (%)]	Dead [n (%)]
Age (years)	50	31 (62)	19 (38)
</= 10	11	4 (36.3)	7 (63.6)
11-39	21	17 (81)	4 (19)
>/= 40	18	10 (55.5)	8 (44.4)
Sex			
Male	37	23 (62.1)	14 (37.8)
Female	13	8 (61.5)	5 (38.5)
Incubation Period (Days)	28		
<7	5	2 (40)	3 (60)
>/= 7	23	15 (65.2)	8 (34.8)
Complications			
Yes	21	8 (38)	13 (61)
No	29	27 (93)	2 (7)
Place of residence			
Urban	4	3 (75)	1 (25)
Rural	46	29 (63)	17 (37)

Discussion

Tetanus is still prevalent in the developing world with a significantly high morbidity and mortality, despite the availability of an effective vaccine. Of the total 50 cases which were studied in the 6 months period between February 2019 to July 2019, 37 were males and 13 were females.

The male preponderance in this study can be explained by the fact that men spend more time in farming activities and other field work and are more likely to be exposed to the Clostridium tetani spores in the soil and that the females are protected against tetanus bythe TT immunization which is given during the antenatal period. This study is in accordance with the findings of other studies which were done in India [6, 7, 8, 9] & developing world [10, 15]

About 46 (92%) patients were from the rural areas as compared to 4 (8%) patients from the urban areas, which reflected the high risk population in terms of the occupation and the general propensity to the risk of injury among daily wage workers or farmers who worked barefoot & were exposed to poor environmental conditions [8].

In the present study, 18 (36%) patients were above 40 years of age, which was in sound agreement with the findings of the studies which were done in Malaysia, Bangladesh & United States of America [11, 15]. This could be attributed to a low immunity against tetanus, as they would have never received the vaccination, or, the protective levels of the tetanus antibody declined rapidly with age. This was also is in agreement with the findings of a study which was done by Chalya *et al*. [10].

All the 50 cases were of generalized tetanus in the present study, with the most common presenting symptoms of trismus - 48 (96%), neck stiffness- 45 (90%), body spasms and stiffness -37(74%) and dysphagia -23 (46%) which was in accordance with the findings of other studies. Of the total

50 patients, 2 patients were known cases of Diabetes mellitus and 1 patient had chronic suppurative otitis media (CSOM).

The most important risk factor for the disease was acute injury, which was seen in 27 (54%) cases. 14% patients had a history of wounds and 6% patients developed tetanus after meeting with road traffic accidents (RTA). 1 patient developed tetanus secondary to dog bite, 1 patients developed tetanus after undergoing a surgical procedure and 1 patients developed tetanus secondary to burns.

In 11 (22%) patients, there was no identifiable portal of entry, thus reflecting that the injuries were very trivial for the patients to be recalled. A majority of the injuries occurred on the lower limb, which was in accordance with the findings of other studies [6, 8, 10, 12].

The incubation period, which is defined as the time between the inoculation of the wound and the onset of the symptoms, was identified in only 28 patients. Of these, 5 (17.8%) patients had an incubation period which was lesser than 7 days and 23 (82.1%) patients had an incubation period of more than 7 days. The duration of the hospital stay for the patients who were discharged alive, was between 1 to 32 days, with a mean of 12 days. Only 7 (14%) patients had received the post injury prophylaxis with the tetanus toxoid. None of the tetanus cases which were identified had a documented evidence of the primary immunization against tetanus.

Complications were seen in 21(42%) people, with cardio-respiratory arrests being seen in 11 (22%) patients and aspiration pneumonia in 2 (4%) of the total patients. The presence of the complications had a statistical significance with respect to the outcome of the patients [Table-1]. None of the patients underwent tracheostomy or were they put on mechanical ventilators for want of an ICU facility. Some patients survived after frequent cardiac arrest & CPR.

In this study, the mortality was found to be 38% which was comparable with the observations by L Ramachandra *et al* . [8] who reported mortality of 23.3% and Patel *et al* . [6] who reported a mortality of 58.3%.

The poor prognostic factors which were seen in this study included age more than 40 years, the presence of complications and a lack of tracheostomy due to the absence of a well-equipped ICU facility. Most of the deaths were due to cardio-respiratory arrests, an observation which was similar to those which were seen in other studies [10, 15].

Conclusion

Though tetanus is a vaccine preventable illness, its prevalence is still high in this part of the country among lower socio economic group. It still remains a difficult disease to treat, with high morbidity and mortality among extremes of age. The incidence of tetanus can be reduced with

- Effective immunization programs & boosters for already immunised adults, as neonates and small children are already covered under the National Universal Immunisation Program.
- An early diagnosis, a proper wound management immediately after the injury, health education programs to create awareness among the public and establishing an ICU facility in the hospital would definitely decrease the morbidity and the mortality.

References

1. Bleck TP. Clostridium Tetani. In: Mandell GL, Bennett JE, Dolin R, editors. Principles and Practices of Infectious Diseases. 6th edition vol 2. Philadelphia: Churchill Livingstone, 2005, 2817-22.
2. Tejpratap SP, Tiwari MD. Tetanus. In: Sandra WR, Lynne M, Linda MB. Manual for the Surveillance of Vaccine Preventable Diseases. 5th ed. Atlanta, GA: Centre for Disease Control and prevention, 2011, 1-6.
3. Elias Abrutyn. Tetanus. In: Fauci AS, Braunwald E, Kasper DL, Hauser SL, Longo DL, Jameson JL, *et al* . Harrison's Principles of Internal Medicine. 20th ed. New York: Mc Graw Hill Inc, 2018, 1102-1104.
4. Farrar JJ, Yen LM, Cook J, Fair WN, Binch N, Parry J, *et al* . Tetanus. Journal of Neurology, Neurosurgery and Psychiatry. 2000; 69(3):292-301.
5. Oladerian I, Meir DE, Ojelade AA, Olaolorn DA, Adeniran A, Tarpley JL. *et al* . Tetanus- a continuing problem in the developing world. World J Surgery. 2002; 26(10):1282-85.
6. Patel JC, Mehta BC. Tetanus: A study on 8697 cases. Indian J Med Science. 1999; 53:393-401.
7. Pawar AB, Kumawat AP, Bansal RK. An epidemiological study on the Tetanus cases which were admitted to a referral hospital in Solapur. Indian Journal of Community Medicine. 2004; 29(3):115-116. Available from: http://www.ispub.com:80/journal/a-retrospective-clinical- study-of-factors –affecting-tetanus.html/.
8. Ramachandra L, Shobha KL, Arun Kannan P. A retrospective clinical study on the factors which affected Tetanus. The Internet Journal of Microbiology. 2009; 7(1).
9. Chavada VK. To study the clinic – epidemiological factors of the Tetanus cases which were admitted to a tertiary care hospital during the last 10 years. Journal of Clinical and Diagnostic Research. 2010; 4:2649-51.
10. Chalya PL, Joseph BM, Ramesh MD, Nkinda M, Stephen EM, Japhet MG. *et al* . A ten-year experience with Tetanus at a tertiary hospital in north western Tanzania: A retrospective review of 102 cases. World Journal of Emergency Surgery. 2011; 6:20.
11. Lau LG, Kong KO, Chew PH. A ten-year retrospective study on Tetanus at a general hospital in Malaysia. Singapore Med J. 2001; 42(8):346-50.
12. Adekanle O, Ayodeji OO, Olatunde LO. Tetanus in a rural setting of south-western Nigeria: A ten year retrospective study. Libyan J Med. 2009; 4:100-04.
13. Amare A, Yami A. The case fatality of adult Tetanus at the Jimma University Teaching Hospital, southwest Ethiopia. African Health Sciences. 2011; 11(1):36-40.
14. Pornchai S, Chutarat S, Kitti L, Suwanna S, Kanitpong P. Tetanus-A retrospective study of the clinical presentations and the outcomes in a medical teaching hospital. J Med Assoc Thai. 2009; 92(3):315-19.
15. Feroz AHM, Rahman MH. A ten-year retrospective study of tetanus at a teaching hospital in Bangladesh. J Bangladesh Coll Phys Surg. 2007; 25:62-69.