ORIGINAL ARTICLE J. Med. Sci. (Peshawar, Print) April 2012, Vol. 20, No. 2: 90-93

TRENDS OF TETANUS PATIENTS IN NORTH OF PAKISTAN

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ABSTRACT

Objectives: To do prospective analysis of tetanus patients, especially with respect to mode of presentation, complications & outcome.

Material and Methods: This study was conducted from January 2009 to July 2011, at Khyber Teaching Hospital, Peshawar. All the patients above 14 years of age who presented with signs, symptoms or complications of tetanus were included in the study.

Result: Total 29 patients were managed, 23 were males and 06 females. Age ranged from 14 to 72 years. Source of infection was evident in 25 (86.20%) patients. The most common site of injury was right lower limb, involved in 13 (44.82%) patients. 14 patients (48.27%) presented with pain at the site of wound. Tachycardia was present in 24 patients & labile blood pressure in 08 patients. Incubation period varied from 05 to 25 days, while onset time varied from 01 to 05 days. History of immunization was present in 10 patients. All the patients were managed in intensive care unit. Five patients were treated with Benzyl penicillin while rest with Benzyl Penicillin and Metronidazole. Wounds were cleaned and debrided. Tetanus toxoid and human tetanus immunoglobulin was injected to all the patients. One patient expired, the rest recovered completely. Recovery period varied from 16 to 31 days.

Conclusion: Tetanus is more common in males, to reduce mortality all the patients should be managed in intensive care unit.

Key Words: Tetanus, opisthotonus, benzyl penicillin, metronidazole.

INTRODUCTION

Tetanus is caused by tetanospasmin, elaborated by *Clostridium tetani.* Spores of this organism are ubiquitous in soil, germinate when introduced into a wound. Vegetative bacteria produce tetanospasmin, a zinc metalloprotease that cleaves synaptobrevin, a protein essential for neurotransmitter release. Tetanospasmin interferes with neurotransmission at spinal synapses of inhibitory neurons, so minor stimuli result in uncontrolled skeletal muscle spasms, also acts on sympathetic nervous system resulting autonomic dysfunction. Tendon reflexes are exaggerated[1].

Incubation period varies from 5 days to 15 weeks. Persons at risk are unvaccinated individuals, the elderly, newborns, and injection drug users. Any wound but particularly puncture wounds, bites or decubiti, may become colonized by *C tetani.* First symptom may be pain and tingling at site of inoculation, followed by spasticity of muscles nearby. Stiffness of jaw, neck stiffness, dysphagia, and irritability are other early symptoms. Hyperreflexia develops later, with spasms of masseter muscles (trismus) or facial muscles, muscles of abdomen, neck and back. Painful tonic convulsions precipitated by minor stimuli are common. Spasm of glottis and respiratory muscles may cause acute asphyxia. The patient is awake and alert throughout the illness. Sensory examination is normal. Temperature is normal or slightly elevated[2]. Death results from aspiration, hypoxia, respiratory failure, cardiac arrest or exhaustion[3]. Mild cases with rigidity usually recover. Poor prognostic indicators include short incubation period, short onset time, extremes of age, autonomic nervous dysfunction, delay in treatment and contaminated lesions about the head and face. Gallais prognostic score is applied[4].

Localized tetanus is a milder form of the disease. Pain and stiffness are confined to site of wound, with increased tone in surrounding muscles. Recovery usually occurs. Cephalic tetanus, uncommon but invariably fatal, occurs when the portal of entry of C. tetani is middle ear. Cranial nerve abnormalities, particularly of the seventh nerve, are usual. Generalized tetanus may or may not develop.

Diagnosis is made clinically, rarely C tetani is isolated from the wound[2]. Complications include

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airway obstruction, aspiration pneumonia, respiratory arrest, dysphagia, cardiac arrhythmias, urinary retention and constipation result from spasm of the sphincters. General management includes complete bed rest, quietest conditions possible, sedation and mechanical ventilation. Penicillin, 20 million units IV daily, is given to all patients to eradicate toxin-producing organisms. Wound must be cleaned and debrided to remove source of toxin. Human tetanus immunoglobin 500 IU should be given along with an intramuscular injection of tetanus toxoid. Protection by passive immunization with either the equine or human antitetanus immunoglobulin is short-lived, lasting only about 2 weeks[1,2]. Aims of our study were to do prospective analysis of patients presenting with Tetanus, especially with respect to mode of presentation, complications and outcome.

MATERIAL AND METHODS

This study was conducted from January 2009 to July 2011, at Khyber Teaching Hospital, Peshawar. All the patients above 14 years of age who presented with signs, symptoms or complications of tetanus were included in the study. Pulse and BP was recorded four hourly, those having suspicion of arrhythmias were put on holter monitor. Readings were not taken during tetanic spasms. A standard proforma was filled regarding the demography of the patients. Nature and site of the wound were recorded. Patients were followed up upto two months after discharge from the hospital. Gallais score was recorded, data was analyzed. Outcome was defined as death, partial recovery or complete recovery. Partial recovery comprises of neck pain, back pain, difficulties in walking and gait abnormalities. Complete recovery means absence of all the above problems. Data was analyzed on SPSS version 10.0.

RESULTS

Twenty nine patients were managed during the study period, 23 were male and 06 were female patients. Their age ranged from 14 to 72 years. Two (6.89%) patients were from Afghanistan while the rest from Pakistan. Source of infection was evident in 25 (86.20%) patients. Out of six female patients, postnatal tetanus was present in only one patient, one developed tetanus after tooth extraction, one after intramuscular injection in deltoid, one after ear piercing and rest two due to nail thorn piercing. The most common site of injury was right lower limb which was involved in 13 (44.82%) patients, Table 1. Fourteen patients ie 48.27% presented with pain at the site of wound, while 07 patients had paraesthesia around the wound. Tachycardia was present in 24 (82.75%) patients while labile blood pressure was present in 08 (27.58%). The clinical features are shown in Table 2. Incubation period varied from 05 to 25 days, while the onset time varied from 01 to 05 days. Generalized tetanus was present in 27 while one had localized and another one had cephalic tetanus. History of immunization was present in 10 patients. All the patients were managed in intensive care unit of our hospital. Five patients were treated with Benzyl penicillin while rest with Benzyl Penicillin and Metronidazole both. Variable degree of sedation was

Table 1: Showing the site of injury

S. No.	Site of injury	No. of patient and Percentage
1.	Right sole	08 (27.58%)
2.	Right toe	04 (13.79%)
3.	Left foot	03 (10.34%)
4.	Right Hand	03 (10.34%)
5.	Ear piercing	01 (3.44%)
6.	Right Knee joint	01 (3.44%)
7.	Left Thigh	01 (3.44%)
8.	Tooth extraction	01 (3.44%)
9.	Right deltoid	01 (3.44%)
10.	Right otitis media	01 (3.44%)

Table 2: Clinical features

S. No.	Clinical Feature	No. of patient and Percentage
1.	Trismus	26 (89.65%)
2.	Tachycardia	24 (82.75%)
3.	Risus sardonicus	22 (75.86%)
4.	Dysphagia	20 (68.96%)
5.	Opisthotonus	19 (65.51%)
6.	Constipation	18 (62.06%)
7.	Pain at the site of wound	14 (48.27%)
8.	Dyspnoea	13 (44.82%)
9.	Urinary retention	12 (41.37%)
10.	Aspiration pneumonia	11 (37.93%)
11.	Labile blood pressure	08 (27.58%)
12.	Paraesthesia around the wound	07 (24.13%)
13.	Cranial nerve palsy	02 (06.89%)

required by almost all patients. In 09 patients the wound was cleaned and debrided while in 12 patients it was cleaned only. Tetanus toxoid and human tetanus immunoglobulin were injected to all the patients. Only one patient expired because of aspiration pneumonia, septicaemia and respiratory arrest. Rest all the patients recovered completely. Recovery period varied from 16 to 31 days.

DISCUSSION

Tetanus is a preventable but potentially fatal disease first discovered in Egypt about 3000 years ago, kills about one million people each year[4] globally and is a major health problem especially in developing world. Out of 29, 23 patients were male patients reflecting 79.31%, showing that population working in fields and out side the home are predominantly affected. Another local study showed 75.8% male patients in their series[5]. The most common site of injury was right foot, reflecting injury in the exposed part of body in the outdoor working environment. Lower limbs were the site of injury in 17 (58.62%) while upper limbs were involved in 03 (10.34%) patients. In another study lower limbs were involved in 65 (43.30%) patients and upper limbs in 35 (23.30%)[6]. No obvious site of injury was present in 04 (13.79%) patients of our series while literature has mentioned no obvious sight of injury in 17.35%[6]. The onset time in our patients varied from 1-5 days, which is quite short as compared to another study in which the median onset time was 07 days, 15% cases occurred within 03 days and 10% after 14 days[7].

Autonomic nervous system (ANS) dysfunction is defined as persistent or labile hypertension or hypotension, tachycardia, tachyarrhythmias or bradyar-rhythmias alternating with tachycardia. ANS dysfunction is reported in about one third of patients with tetanus and it reflects a bad prognosis as it predisposes to cardiac arrest in this post ventilation era[4,8,9]. ANS dysfunction is known since 1960[10]. ANS Dysfunction results from damage to brain stem nuclei[11] and sympathetic and parasympathetic system disturbances[12]. An ECG study in India has shown sinus tachycardia in 85% tetanus patients[13]. Tachycardia which is a bad prognostic sign[14] was present in our 24 patients reflecting 82.75%. Labile blood pressure which is one of the hard sign of ANS dysfunction was present in 08 patients ie in 27.58%, again signifying that about one third of patients with tetanus develop ANS dysfunction[4,8,9]. Trismus was the most common presenting feature in 26 patients ie (89.65%), followed by risus sardonicus in 22 ie (75.86%) and opisthotonus in 19 patients ie (65.51%). Left facial nerve palsy occurred in 02 patients. Respiratory arrest occurred in 04 patients ie 13.79%, three were saved while one patient died.

The low mortality in our series is probably due to very good ICU care to almost all the patients admitted and partly because the number of our patients, was small. World wide prognosis varies from 10% to 50% for tetanus patients. A local study done in another city of North of Pakistan has shown a mortality of 19.3%[6]. Poor prognostic factors include short incubation period, short onset time[14,15], fever[16], tachycardia, fluctuating BP, tetanus due to intramuscular quinine[18], extremes of ages[17], hypoxia and acidosis at admission[18]. The major cause used to be respiratory arrest before the ventilation era but now after the introduction of ventilation era, infections and ANS dysfunction are the most common causes[19,20].

CONCLUSION

In order to reduce mortaility all the patients of Tetanus should be managed in intensive care units.

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