

The Clinical Characteristic and Treatment outcome of Tetanus Patients in Tertiary Care Hospital

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ABSTRACT

Objective: To describe the clinical characteristic and treatment outcome of tetanus patients admitted to Medical Unit of STH Swat.

Study Design: Cross sectional study.

Place and Duration of Study: This study was conducted at the Medicine Department of Saidu Group of Teaching Hospital Swat from 16-02-2013 to 14-07-17.

Materials and Methods: This case series study was carried out on patients with established tetanus admitted to Medical Unit of SGTH Swat, from 16/02/13 to 14/07/17 and later on discharged, expired or referred to other teaching hospitals of the province. A total of 42 consecutive patients were included in the study. The relevant information including complications like cellulitis, autonomic instability, nosocomial pneumonia, acute renal failure, hyperthermia, respiratory failure and cause of death were recorded on a Performa which was maintained for every patient from admission to outcome. Analysis was done in SPSS version 20.

Results: The mean age of the patients presenting with tetanus was 30.5714 with minimum age of 10 years and maximum of 75 years. The male to female gender ratio was 7:1 with 88.1 % male and 11.9% female. None of these patients were previously immunized against tetanus. 28.60% patients were having no apparent route of possible entry while 26.20% had entry wound on lower limb, 19.03% on upper limb, 19.3% had post-surgical/obstructive wound and 7.14% having wound on face or neck. Most of the patients (40.47%) stayed in the unit from 1 to 7 days while 33% for less than 24 hours and 26.20% for more than 7 days. The complications developed were cellulitis in 26.20%, autonomic instability 26.20%, nosocomial pneumonia 16.70%, acute renal failure 11.90% hyperthermia 9.50% and respiratory failure 9.50%. Ten (23.8%) patients needed tracheostomy. 3 (7.14%) patients needed mechanical ventilator support who were referred to other hospitals of the province. Out of 42 patients with established tetanus, 13 (31%) expired. All of these expired patients were having severe disease on the basis of Philips Scoring System. The immediate cause of death was respiratory arrest 30.79%, cardiac arrest 23.07%, renal failure 23.07% and septic shock 23.07%.

Conclusion: The preventable disease like tetanus has a high mortality even in tertiary care hospital due to lack of immunization and proper management of wounds.

Key Words: Tetanus Clinical characteristic, Treatment outcome.

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INTRODUCTION

Tetanus is an acute often-fatal neurological disorder resulting from the contamination of wounds by clostridium Tetani, a spore forming Gram positive, motile, rod shape, obligate anaerobic organism¹.

Under anaerobic conditions tetanus bacillus produces tetanospasmin (atoxin), which binds to peripheral motor neuron terminals. It is then transported retrograde within the nerves to cell of motor neurons of that segment of cord.

In spinal cord and brain stem it block release of the inhibitory neurotransmitter Glycine and GABA. The alpha motor neurons are therefore under no inhibitory control and undergo sustained excitatory discharge causing the characteristic motor spasms of tetanus. The loss of inhibition also affects preganglionic sympathetic neurons and produces autonomic dysfunction².

Wound on the lower limbs, postpartum or post abortion infection, compound fractures and minor trauma provide the common portals of entry. In 30% of the patients no portal of entry is apparent. The incubation period can be as short as 24 hours or as long as many months².

Four clinical varieties are recognized in general. Seventy five percent present with locked jaw. It is the most common type of tetanus (81%) Rigidity, risus sardonicus, opisthotonus and spasms, autonomic dysfunction, tachycardia, tachycardia, labile blood

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pressure, sweating, and cardiac arrhythmia are other clinical features of this type of tetanus. Cephalic, localized and neonatal tetanus are the other varieties³.

Routinely, the diagnosis of tetanus is based on clinical features. In adults, it should be differentiated from tetany, strychnine poisoning, drug induced dystonic reaction, rabies and orofacial infection. In neonates, hypocalcemia, hypoglycemia, meningitis, meningoencephalitis and seizure should be excluded. Respiratory collapse, aspiration pneumonia, bronchopneumonia, and respiratory failure are the common respiratory complications of tetanus³.

The Philips prognostic Scoring System is commonly used to categorize tetanus. Short incubation period, cephalic variety, extremes of age and skin poppers, are the poor prognostic indicators of disease⁴.

Tetanus is an entirely preventable disease, which can be prevented by giving tetanus toxoid (TT) or immunization with DPT⁵.

The specific treatment of an established tetanus consists of human anti tetanus immunoglobulin, wound debridement, sedations for fits, antibiotics, nutritional support along with other supportive care.⁶

Tetanus is endemic in Pakistan and prevalent in the rural population of our country⁷.

This study was conducted to find out the clinical characteristic and treatment outcome of tetanus patients admitted to general medical unit in our set up.

MATERIALS AND METHODS

After taking an informed consent, this descriptive study was carried out on patients admitted to Medical Unit of Saidu Teaching Hospitals Swat. The study included 42 patients with established tetanus from 16-02-2013 to 14-07-2017.

All ages and both genders were included in the study. The diagnosis of tetanus was made on clinical features. For severity of the disease Philips scoring system was adopted. Wound of entry, treatment given before coming here, complications developed and the treatment given for this complication were recorded. The final cause/factors responsible for complication and death were also noted.

The neonatal tetanus and patients with ambiguous or localized tetanus were excluded from the study.

Relevant laboratory investigations were carried out where needed. Analysis was done in SPSS version 20. The frequencies and percentages were calculated for all variables. The age group was expressed in range and ratio was determined for gender. The data was presented in tables and figures.

RESULTS

The mean age of the patients with tetanus Mean Age was 30.5714 with a minimum age 10 and maximum of 80. Most of these patients were between 21 to 60 years (60%).

On the basis of Philips scoring System, 5 (12%) Patients were having mild, 7 (17%) patients moderate and 30 (71%) severe disease.

The age and sex distribution of the patients is given in the table.

Table No.1: Age and Sex Distributions

Age	Male N=37	Female N=5	Total N=42
10 – 20	12	2	14
21-40	12	3	15
41-60	10	0	10
Above 60 Years	3	0	3

Ten (23.8%) patients needed tracheostomy and three (7.14%) patients were referred for mechanical ventilator.

Out of 42 patients 13 (31%) expired in our unit.

All of these expired patients were having severe disease on the basis of Philips Scoring System.

The age and sex distribution of these expired patients is given in table.

Table No.2: Age and Sex Distributions of Expired Patients

Age	Male N=10	Female N=3	Total N=13
10 - 20	8	2	10
21-40	1	1	2
41-60	1	0	1
Above 60 Years	0	0	0

The wound of all of these patients were not appropriately treated before coming to the medical unit of Saidu Teaching Hospital Swat.

The route of possible entry is given in the table.

Table No.3: Route of Possible Entry

Route of Entry	No of patients n=42	% age
Entry wound on face, Neck or body wall	3	7.14%
Entry wound on upper limb	8	19.03%
Entry wound on lower limb	11	26.20%
Post-surgical/Obst	8	19.03%
Unknown	12	28.6%

None of these patients were previously immunized (active or passive). The stay of these patients in medical unit is mentioned in table.

Table No.4: Stay in Medical Unit of SGTH Swat

Stay	No of patients N=42	% age
Less than 24 hours	14	33.33%
1-7 days	17	40.47%
More than 7 days	11	26.20%

The important/major complications, which the patients develop during their stay is given in table.

Table No.5: Complications Developed in Tetanus Patients

Complications	No of patients n=42	% age
Cellulitis	11	26.20%
Autonomic instability	11	26.20%
Nosocomial pneumonia	7	16.70%
Acute Renal Failure	5	11.90%
Hyperthermia	4	9.50%
Respiratory Failure	4	9.50%

Most of these complications contributed to the ultimate cause of death which is given in table.

Table No.6: Cause of Death

Factors	No of patients n=13	% age
Septicemia/Septicshok	3	23.07%
Renal Failure	3	23.07%
Respiratory Failure	4	30.79%
Cardiac arrest	3	23.07%

DISCUSSION

Tetanus is prevalent in developing countries and contributes to high morbidity and mortality despite the availability of affective tetanus vaccines since 1923⁸.

Better awareness of tetanus prophylaxis is necessary and future tetanus prophylaxis may be more effective in prevention of the disease. None of these 42 patients in this study had received previously active immunization in the form of T.T.

More than 50% of patients in our study were the young (10-40 years). The same pattern was also observed by Feroz AHM and Lau LG in other developing countries like Bangladesh and Malesia respectively^{9,10}. This is due to non-immunization status of these individuals.

The vanning of immunity, in previously fully immunized individuals, is the major cause of tetanus in developed world¹¹. This was not reflected in ours study. Most of the patients in this study were males belonging to rural areas and former by profession. This is according to the studies carried out by Feroz AHM and Phillip L Chalya1 et al^{9,12}. The reasons for such observations are the outdoor activity in which males are commonly involved. Moreover, mass immunization program for female during antenatal care is the probable preventive factor and for low incidence in female⁵.

A good number of the patient had entry wound on lower limb, which is the commonest site in other parts of world as well^{9,10}. This is also another cause for high incidence of the disease because barefoot walk is more common in young male as compared to other people of the society especially third world¹².

Our twelve (28.6%) patients were having no apparent wound. The minor and forgotten injury is the probable

cause as observed by Phillip L Chalya1 et al in his study at Tanzania where 33.6% of patients with established tetanus had no apparent wound on the body¹².

Generalized fits, locked jaw and dysphagia were the commonest presentations in our patients. This is also according to observations of Feroz AHM and Lau LG et al^{9,10}.

Tracheostomy was performed in ten patients to prevent laryngeal spasm and for suction of secretions. This is more than 15.7% of procedure done as reported by Phillip L Chalya1 et al in Tanzania¹².

Almost all of these patients developed complications. This is much higher than the observations of Younas NJ and Amare A1 et al^{7,13}.

All of those patients who expired in our unit were in the age range of 10-40 years. Komolafe MA et al reported 53.5% mortality in Nigeria in this age group¹⁴.

The overall mortality in patients shifted to our unit during these years was 31%. This is lesser than the mortality of 53.5% in Nigeria.¹⁴

Seven (16.67%) patients had moderate disease with 0% of the overall mortality, which is lesser than the 15.3% mortality in patients with moderate disease in Turkey.¹⁵ Severe tetanus had 92% mortality in Turkey while we observed 65% in our patients.¹⁵ The overall 31% mortality in our study papulation is lesser than the 40% mortality in the other developing countries.^{8,16,17}

The overall worldwide mortality is 10-50%¹⁸.

Three (7.14%) patients who expired, needed artificial ventilator support and were referred to be put on ventilator but unfortunately they couldn't reach the facility. It is due to the non-availability of mechanical ventilator in our setup.

Autonomic instability, cellulitis, hyperthermia and nosocomial pneumonia were the common complications, which develop during the course of illness and were the major contributing factors of mortality in those patients expired in medical unit of our hospital. Such types of complications were also reported by other observer as well^{15,19,20}.

The poor prognostic factor in this study were younger age, wound on lower extremity, late shifting, non-immunization, wound of mismanagement, development of serious complications and non-availability of ventilators. These factors are also responsible for higher mortality in Turkey as reported by Saltoglu N et al¹⁵.

CONCLUSION

Tetanus, which is an entirely preventable disease, has very high mortality in our set up. Lack of active immunization, mismanagement of wounded and complications which develop during the course of management are the major contributing factors of high mortality even in tertiary care hospitals like ours.

Author's Contribution:

Concept & Design of Study:	Wasil Khan and Abdul Jabbar
Drafting:	Wasil Khan and Abdul Jabbar
Data Analysis:	Wasil Khan and Abdul Jabbar
Revisiting Critically:	Wasil Khan and Abdul Jabbar
Final Approval of version:	Wasil Khan and Abdul Jabbar

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