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Research Article

**CLINICAL FEATURES OF TETANUS PATIENTS IN
PEDIATRIC ICU****Dr. Zain-ul-Harman, Dr. Syed Ammad Saeed, Dr Tariq Mehmood**
¹BVH Bahawalpur**Article Received:** November 2019 **Accepted:** December 2019 **Published:** January 2020**Abstract:**

Objective: *This research work aimed to examine the demographic & clinical traits, findings, treatment expenses & complications of the tetanus patients who got admission in Pediatric ICU (Intensive Care Unit) in General Hospital Lahore.*

Methodology: *This research work is descriptive study based on observations carried out in General Hospital, Lahore from August 2017 to July 2019. Tetanus patients who got admission in pediatric ICU in the duration of this research work were the participants of this research work. We collected the data from files of the patients and we also included the data about demography, clinical appearance, and severity grade, duration of stay in hospital, outcomes and complications. We also included the treatment expenses. We applied the descriptive statistics for the description of the findings.*

Results: *In the duration of this research work, total twenty three patients of tetanus got admission in pediatric ICU in which 12 patients were male and eleven patients were females. Most of the patients (13) were in the age group of two to six year of age. There were 17 unvaccinated patients and six patients received only OPV & BCG. No patient was present suitable vaccinated for the age. Nine patients were present with tetanus after surgery, among them six patients were males, five patients had otogenic tetanus and nine patients were present with no identifiable portal of entry. Total 11 patients were in the Grade-3 severity of classification of Ablett and six patients were in Grade-4 severity. There was rate of mortality in our patients of 26.0%. We noticed autonomic instability in seventeen patients and there was requirement of ionotropic support in all these patients. The estimated expense of every day tetanus treatment with use of mechanical ventilation was about 31979 rupees and with no mechanical ventilation, it was 20000 rupees.*

Conclusion: *Tetanus is completely preventable complication with high rate of mortality. The therapy of this disease is much expenses in comparison with the vaccination which is free in our country. Proper care of wound and complete vaccination is the best option to decrease the tetanus burden.*

Keywords: *Tetanus, complication, mortality, frequency, therapy.*

Corresponding author:**Dr. Zain-ul-Harman,**
BVH Bahawalpur

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INTRODUCTION:

Tetanus is the outcome of the Clostridium Tetani which creates a strong neurotoxin tetanospasmin which has the ability to affect the CNS (Central Nervous System) [1]. This disease is completely preventable with immunization, there is very large burden of this disease in complete world. Global occurrence of tetanus is about one million patients per year with mortality rate of 20.0% to 50.0% [2]. Majority of the patients of tetanus follow penetrating injury of skin. There is association of tetanus with the burns, ulcer, snake bite, delivery, injections and surgical intervention [3]. Tetanus outbreaks have relation with injuries linked with the natural disasters like earthquakes and tsunamis [4-6]. With the immunization programs, there is always decline in the occurrence of tetanus [7]. The incidence of tetanus is endemic in many countries of the world because of the deficiency of immunization programs [2]. In fully developed countries high utilization of the active immunization have contributed a lot to decline the occurrence of tetanus and this fact also decreases the high rate of morbidity as well as mortality [8]. This research work carried out to determine the occurrence of tetanus patients in our region, associated complications and outcomes.

METHODOLOGY:

Children having the age of less than twelve years were the recruits of this research work. We collected the data from the records of the patients. Information contained data about profile of demography, clinical appearance, severity grade, duration of stay in ICU, related complications and outcome of disease. This record also contained the treatment expenses. We applied the descriptive statistics for the description of the findings. The tetanus management emphasizes upon the care of wound, toxin's neutralization, antibiotic treatment, supportive preventive measures as good nursing care with convulsions control and active immunization. We evaluated the patients completely for their respiratory condition, severity

grade, and portal of entry and status of wound. We kept all the patients in isolation. We carried out strict aseptic measures in complete treatment duration. We gave the patients 0.50 ml tetanus toxoid as part of active immunization for their treatment. We started diazepam 5.0 to 10.0 mg/kg/day, 50.0% of dose being given IV, and 50.0% orally in 4 divided doses in all patients. There was requirement of a dose of 20.0 mg/kg/day six hourly in some patients. We also gave phenobarbitone to our patients. We also gave 0.50 to 1.0 mg/kg/dose every six hourly, initially IV & later through oral way. We also started injectable magnesium sulphate for all patients with a dose of 70.0 to 75.0 mg/kg and maintained them on 20.0 to 25.0 mg/kg/dose eight hourly for a mean duration of one single week. This dose decreases the catecholamine release [9].

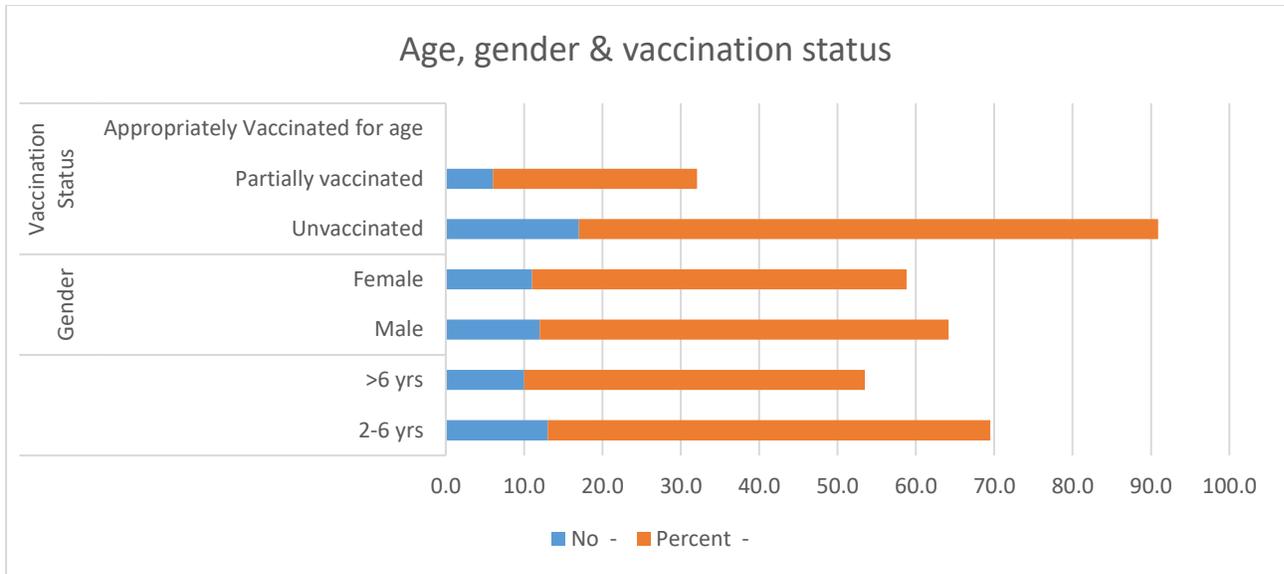
We gave Midazolam 0.10 mg/kg/hour & atracurium 1.0 mg/kg/hour to the patients who were in need off ventilation. In these patients, we decreased the diazepam dose to 50.0%. There was also requirement of inotropic in seventeen patients. We also provided physiotherapy after their stabilization. We gradually tapered the muscle relaxants for the prevention from stiffness and spasms and we advised the patients to use for at least three to four months. We counselled the patients about the vaccination importance and we also provided them complete schedule for the active immunization and other family members.

RESULTS:

There were total twenty three patients of tetanus who got admission in our institute in the duration of this research work from August 2017 to July 2019. There were twelve male and eleven female patients. Most of the patients were present in the age group of two to six years. We saw no patients with less than 2 years of age. There were seventeen unvaccinated patients, 6 patients were present with partial vaccination (only BCG and OPV at time of birth) and no patient was present with appropriate vaccination for age (Table-1).

Table-I: Age, sex and vaccination status of tetanus patients (n=23).

Variables		No	Percent
Age	<2 yrs	-	-
	2-6 yrs	13.0	56.500
	>6 yrs	10.0	43.470
Gender	Male	12.0	52.170
	Female	11.0	47.820
Vaccination Status	Unvaccinated	17.0	73.910
	Partially vaccinated	6.0	26.080
	Appropriately Vaccinated for age	-	-

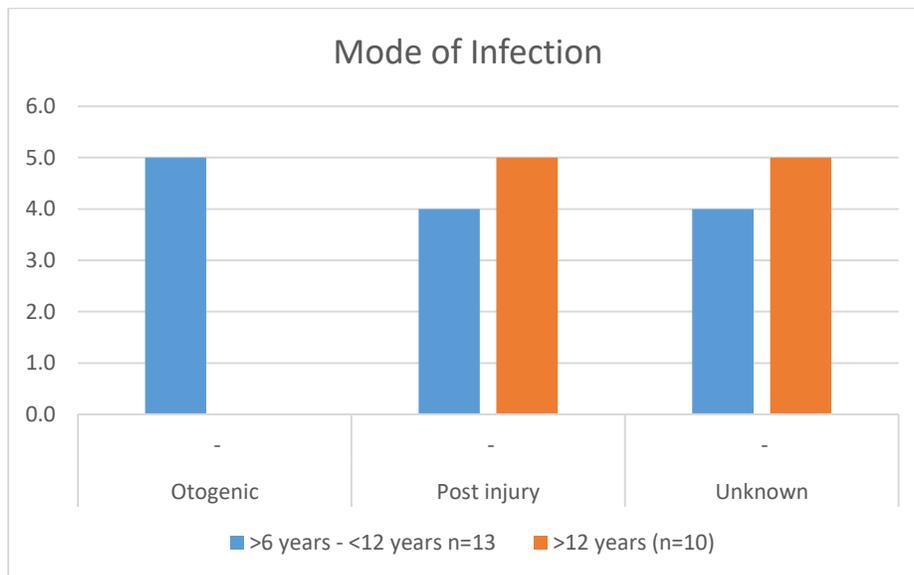


The mode for tetanus acquiring is present in Table-2. We saw the otogenic tetanus in the age group of two to six years. Among nine patients of trauma tetanus, seven patients were present with trauma to the lower part of limbs. We observed the mean IP (Incubation Period) in patients of post-trauma as 7 days. In accordance with the severity grade of Ablett

classification, most of the patients i.e. 47.82% (n: 11) were in Grade-3. Six patients were present in Grade-4 severity and no patient was present in Grade-1 severity. There were four patients with altered GCS with ranging 8 to 12. We shifted seventeen patients to wards and six patients met their death.

Table-II: Mode of infection in tetanus case (n=23)

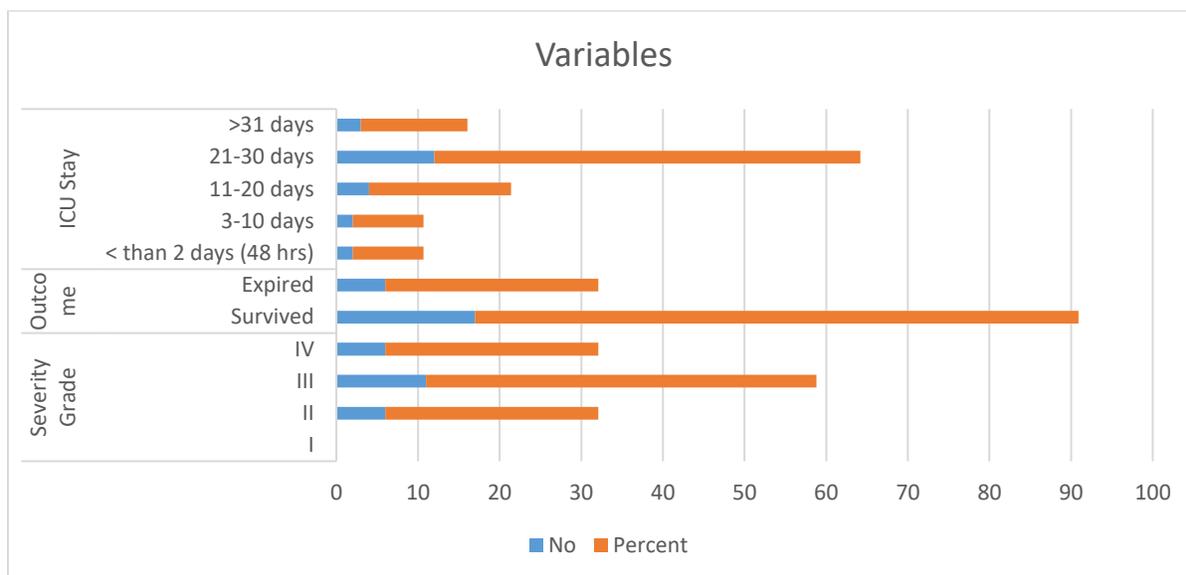
Mode of infection	< 2 years 2-6 years, n=0	>6 years - <12 years n=13	>12 years (n=10)
Otogenic	-	5.0	-
Post injury	-	4.0	5.0
Unknown	-	4.0	5.0



The stay of most of the patients (n: 15) was greater than 3 weeks. Three patients among them stayed for greater than six weeks (Table-3).

Table-III: Ablett grade of severity, out come and length of stay (LOS)

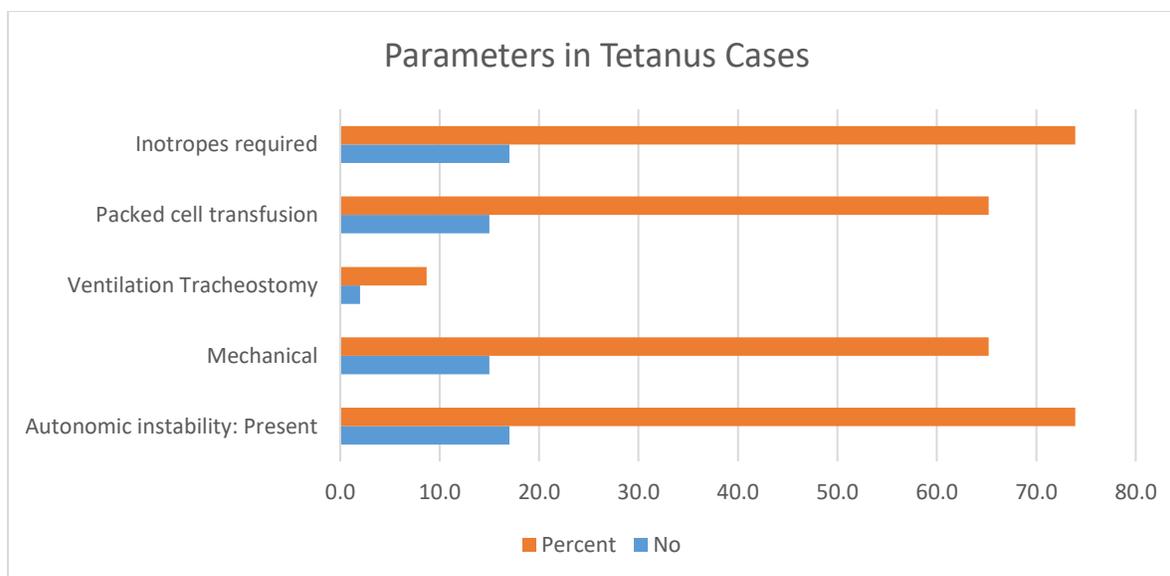
Variables		No	Percent
Severity Grade	I	0	0
	II	6.0	26.080
	III	11.0	47.820
	IV	6.0	26.080
Outcome	Survived	17.0	73.910
	Expired	6.0	26.080
ICU Stay	< than 2 days (48 hrs)	2.0	8.690
	3-10 days	2.0	8.690
	11-20 days	4.0	17.390
	21-30 days	12.0	52.170
	>31 days	3.0	13.040



Total 15 patients had to undergo intubation & mechanical ventilation for a mean duration of ten days with range of eight to twelve days. Out of these fifteen patients, five patients were in Grade-4 and ten patients were in Grade-3 of severity (Table-4).

Table-IV: Different parameters in tetanus cases n=23.

Parameters	No	Percent
Autonomic instability: Present	17.0	73.910
Mechanical	15.0	65.210
Ventilation Tracheostomy	2.0	8.690
Packed cell transfusion	15.0	65.210
Inotropes required	17.0	73.910



We recorded following complications in the patients of this research work; infection of lower respiratory tract in 5, hypotension in seventeen, acute kidney infection in 15, sepsis in 10, constipation in twenty and only 1 patient was present with nephrotic syndrome lapse. There was development of toxic shock syndrome and he expired. We observed the hypoxic brain injury causing in the neurological deficits in 3 patients. We put them on anti-epileptics because of the persistence of convulsions.

DISCUSSION:

This was a retrospective descriptive research work and we found a high prevalence of tetanus in the children having two to six year of age. This prevalence is much comparable with the other research works [10]. There is always prevalence of this disease among males because males remain busy in more outdoor activities [2]. About the trauma site, majority of the patients was present with lower limbs injury which is in support of various research works [10, 11]. Dissimilar to other diseases, this disease is completely preventable by active immunization [12]. There is recommendation of routine tetanus vaccination for adults in every ten years [13]. We also noted that all the patients were present without vaccination, which is much threatening fact that the vaccination rate in our children is falling [14]. Due to being an agriculture country, this complication is much common in our country so, the vaccination of this complication is very important [2]. Much similar to other research works; trismus, stiffness of body and dysphagia were the most common complaints in our patients [2, 6, 10, 11]. There are various grading systems for the severity grading of the tetanus but we selected the Ablett classification [15].

The most common in the patients of tetanus is the autonomic dysfunction [16-18]. It normally initiate after one week of the complication and lasts for one to two weeks. This is because of the impact of tetanus toxin on brain stem. This is mainly because of the paroxysmal increase in the sympathetic activity causing hypertension, pyrexia & tachycardia at times [19]. There was need of mechanical ventilation in our fifteen patients. The range of the rate of mortality of tetanus is from 20.0% to over 50.0% as presented in various research works [2, 6, 10, 17, 20, and 21]. The rate of mortality was 26.0% in this research work.

CONCLUSION:

Proper care of wound and complete vaccination are the suitable options to prevent the frequency of tetanus among children which is a disease with high rate of morbidity as well as mortality and high cost of treatment.

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