

An epidemiological study of Tetanus cases in a tertiary care hospital of Jaipur, Rajasthan

Dr. Rekha Shekhawat¹, Dr. Nikita Sharma^{2§}, Dr. Vikram Singh Sodha³,
Dr. Suresh Kewalramani⁴

^{1,2}Junior Resident, Department of Community Medicine, SMS Medical College, Jaipur (Rajasthan) India

³Senior Resident, Department of Surgery, Jaipuriya Hospital, Jaipur (Rajasthan) India

⁴Associate Professor, Department of Community Medicine, SMS Medical College, Jaipur (Rajasthan) India

[§]Corresponding author's Email: nikitarishi81@gmail.com

Abstract—In developing countries like India tetanus is still a public health problem as compared to developed countries. Although TT vaccination in pregnant women has given its dividends then also people are having tetanus even now. So this hospital based study was conducted to find out epidemiological factors in tetanus patients; admitted in a tertiary care hospital, Jaipur. This study was conducted on 192 tetanus patients above one year of age, who were admitted in Infectious disease hospital SMS, Jaipur Rajasthan during March 2017 to august 2018. Patient's detailed history was obtained and findings entered in proforma. Scoring was done by modified scoring system for grading of tetanus. Out of 192 cases 77.6% were below 40 years; out of these 60% were in age range of 1 to 20 years and median age was 17.6 year. In the study 73.4% were male and 27% were female and 83.9% of the cases were from rural and 16% from urban area. The completely immunized cases against tetanus were only 2%. The most common cause of tetanus was injury (54.6%) and the foot (42%) was commonest site of injury. The case fatality rate was 16.1%; which was more in above 40 year of age, in partial/non immunized cases and in severe cases. It can be concluded that tetanus cases were seen more in male and from rural area. Trauma was the most common cause of tetanus and among trauma Foot injury was commonest. Immunization status was significantly associated with fatality of cases, there was big lack of immunization which contributed in case fatality of tetanus.

Keywords: Tetanus, Epidemiological Factors, Immunization, Case Fatality Rate, Foot Injury.

I. INTRODUCTION

Tetanus is an acute fatal disease caused by an exotoxin- tetanospasmin which is produced by *Clostridium tetani*, an anaerobic bacillus, whose spores survive in soil and cause infection by contaminating wounds. It is characterised by painful muscular spasms especially of jaw, facial and neck muscles.¹ It is a vaccine preventable disease.¹

The global incidence of tetanus has been estimated at approximately one million cases annually.^{1,2} In Developed countries with effective implementation of immunization programme, prompt wound management, incidence of tetanus is rare now. It was reported that in UK since 1947 tetanus cases and deaths from tetanus have been declined by >95% and >99% respectively.³

India has also achieved maternal neonatal tetanus elimination i.e. < 1 cases per 1000 live birth in May 2015.⁴ It became possible due to improved childbirth practices and increased levels of maternal immunity resulting from tetanus toxoid immunization during antenatal period.

But still tetanus is a public health problem especially in rural areas due to incomplete immunization, lack of health education and poor hygiene. The present study was conducted to study the epidemiologic factors associated with tetanus with their fatality.

II. METHODOLOGY

This hospital based observational study was done at Infectious disease hospital, SMS Jaipur, Rajasthan during March 2017 to August 2018.

The tetanus cases admitted during this period were included in the study. A written informed consent had taken from the cases or their relatives. Total of 192 tetanus cases were included in this study. Patients detailed history like age, sex, residence, immunization status, history of injury were taken. The modified scoring system⁵ was used to grade the tetanus.

The Data was entered in Microsoft excel version 2010 and analyzed by SPSS version 21 (Trial version). Results were expressed in percentages and proportions. Chi square test was applied to find out associations. For significant p value <0.05 considered significant.

III. RESULTS

In present study out of 192 tetanus cases majority were below 40 years of age (77.6%) and mean age was 17.6 years. Most of the patients were males (77.6%) and from rural background (83.9%). The male to female ratio and rural to urban ratio were found 2.8:1 and 5.2:1 respectively. In this study completely immunized, partial and non immunized cases were 2%, 42.1% and 45.3% respectively. Most common cause of tetanus was found trauma (54.6%) followed by ear infections/otic (24.6%) and others (20.8%) like burn, idiopathic, infections etc. (Table 1)

Table 1
Characteristics of Tetanus Cases (N=192)

S. No	Variables	Number	Percentage (%)
1	Age	< 40	149
		>40	43
2	Sex	Male	141
		Female	51
3	Residence	Rural	161
		Urban	31
4	Immunization status	Not immunized	87
		Partial	81
		Unknown	20
		Complete	4
5	Causes of tetanus	Trauma	105
		Otic	47
		Others	40

In present study, it was observed that lower limb injury was the most common site (42.9%) of injury in tetanus cases after that face & head (32.4%), upper limb injury (24.8%) were the common sites. (Figure 1). In present study mild, moderate and severe cases were 52.1%, 27.6% and 20.3% respectively. (Figure 2)

Figure 1
Site of injury wise distribution of Traumatic Tetanus cases (N=105)

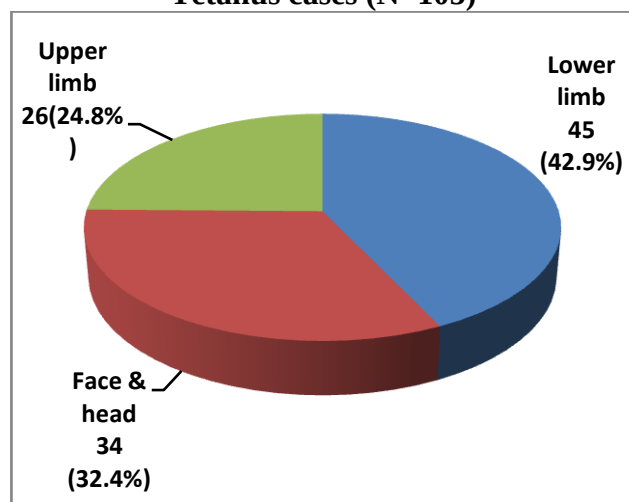
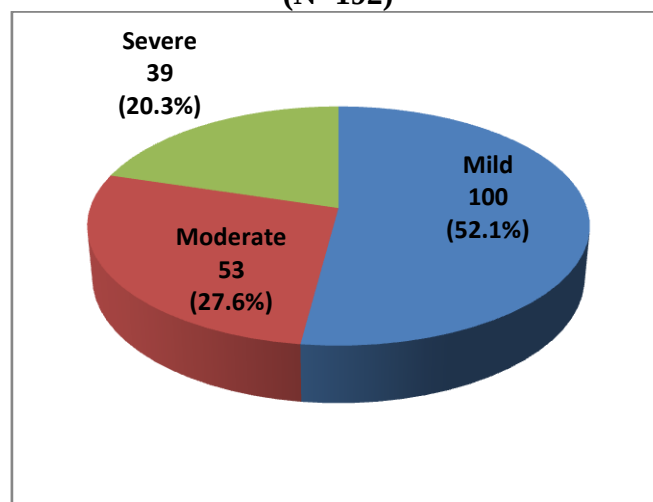


Figure 2
Grading wise distribution of in Tetanus Cases (N=192)



Out of 192 tetanus cases, 161 (83.9%) were cured. The case fatality rate was 16.1% in this study. The case fatality was found significantly associated with immunization status and severity of disease. The mortality was observed 23.2% in above 40 year of age, 21.5% in females, 16.1% in rural, 28.7% in non immunized, 18% in trauma cases and 76.9% in severe cases. (Table 2)

Table 2
Associating Factors of mortality in Tetanus Cases

S. No	Variables		Expired (N=31)	Cured (N=161)	P Value LS
1	Age	< 40 (N=149)	21	128	0. 229 NS
		>40 (N=43)	10	33	
2	Sex	Male (N=141)	22	119	0. 453 NS
		Female (N=51)	11	40	
3	Residence	Rural (N=161)	26	135	<0.001 S
		Urban (N=31)	5	26	
4	Immunization status	Not immunized (N=87)	25	62	0. 229 NS
		Partial (N=101)	6	95	
		Complete (N=4)	0	4	
5	Causes of tetanus	Trauma (N=105)	19	86	0. 694 NS
		Otic (N=47)	6	41	
		Others (N=40)	6	34	
6	Grading of Tetanus	Mild (N=100)	0	100	<0.001 S
		Moderate (N=53)	1	52	
		Sever (N=39)	30	9	

**Chi square test were applied for significance*

IV. DISCUSSION

The present study was conducted on 192 tetanus cases admitted at infectious disease hospital, SMS Jaipur Rajasthan to find out epidemiological factors related to tetanus and their association with mortality due to tetanus.

In present study majority of patients were below 40 year of age (77.6%) and mean age was found 17.4 year. This result was accordance to Indian studies.^{3, 6-7} But in developed nation tetanus occurs mainly in elderly population. In developing nation's younger population affects more from tetanus due to avoidance of proper treatment of injuries and immunization. The majority of cases were males (73.4%) and from rural background (83.9%). The similar findings were observed in other studies.^{6,8} Due to more opportunities of injuries males are more affected from tetanus and due to inadequate environmental hygiene, immunization in rural area more cases are found.

The trauma (54.6%) was the most common cause of tetanus and most common site of injury was lower limb (42.9%) in present study; mainly due to working bare foot in the fields and road traffic accidents. The other studies^{6,7} also reported similar observations.

Majority of cases were none or partially immunized (45.3% and 42.1%) with tetanus toxoid and only 2% cases were completely immunized. Masthi et al⁸ study also found that mostly patients were non or partially immunized. So there is big negligence on the part of both the individuals as well as the health delivery system.

In present study case fatality rate due to tetanus was observed 16.1%. This rate was found quite lower than other studies^{3,7,9} Due to timely and proper institutional management. It was observed that mortality rate was significantly associated with severity of disease and immunization status. Mortality was found significantly more in severe cases and in non immunized cases than their counterparts.. The other studies^{8,10-12} also revealed severity of tetanus and immunization status of cases had association with mortality.

V. CONCLUSION

This present study concluded that tetanus cases were seen more in male and from rural area. Trauma was the most common cause of tetanus and among trauma Foot injury was commonest. Immunization status and severity of disease were significantly associated with fatality of cases, there was big lack of immunization which contributed in case fatality of tetanus.

CONFLICT OF INTEREST

None declared till now.

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