

Tetanus, a burden on community - A retrospective study in Mewat

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Context: Tetanus, a vaccine preventable neuromuscular disorder, if not diagnosed promptly can be life threatening. It is still a matter of concern in our country though some states had validated tetanus elimination. This study was carried out to highlight the presence of the disease in community and to know the clinical spectrum and outcome of tetanus.

Material method: 41 patients of tetanus up to 14 yr including 9 newborn, admitted between January 2012 to Dec 2014 were studied retrospectively. Data regarding the age, sex, and immunization, source of infection, clinical presentation and outcome were collected from the case sheets of the patients. Diagnosis of case was made based on clinical features. Management of cases was done as per the standard guidelines and outcome was summarized and interpreted.

Result: In neonatal group, home delivery was observed in 100% of cases while maternal immunization was done in only one patient. About 77.7% cases belonged to grade 3 and mortality was observed in 44.4% cases indicating the severity of the disease. Umbilical sepsis, circumcision, head shaving was most common source of infection. However in post neonatal group none of the patient was completely immunized for age. Most common source of tetanus was injury (31.25%) followed by otogenic (21.87%). Feature of autonomic instability was seen in 77.7% cases in neonates and 21.87% cases in post neonatal group.

Conclusion: In spite of effective measures taken by the Government of India and its preventive measures, deaths from neonatal tetanus remained high. This study indicates that the tetanus is still is a major cause of morbidity and mortality in this pocket of the state and needs implementation of immunization programme honestly and sincere reporting at every level in health care system so that a single case will not be missed.

Keywords: Autonomic instability, circumcision, neonatal tetanus.

INTRODUCTION

Despite being vaccine preventable disease, Tetanus is still a cause of high mortality in developing countries like India. It continues to occur in neonates and older children. As per WHO, India has total of 2814 cases of tetanus and 415 cases of neonatal tetanus annually in December 2014 which is much higher than its neighbouring South-east Asian countries and this number of tetanus cases is steady from last 6-7 years.[1,2] By February 2012, 25 countries including 15 states of India and union territories have been validated as having achieved MNT (maternal and neonatal tetanus) elimination in which Haryana is one of the states. [3]

Tetanus is a neuromuscular disorder characterised by muscular spasms and autonomic disturbances. Tetanus is caused by tetanospasmin, a toxin produced by *Clostridium tetani*. However bacterium is isolated in only 30% cases from wound and is often isolated from patients who have not developed tetanus. [4] The incubation period has been reported to vary from 1 day to several months, but the majority of cases occur within 3-21 days following inoculation of spores. This disease is common in areas particularly where soil is cultivated in warm climate.

Mewat is one of the districts in Haryana where the immunisation coverage is poor as compared to rest of Haryana due to multiple factors. The vaccination coverage of DPT is just 16% and BCG is 53% as per DLHS3. [5] Only 12.2% of children are fully vaccinated; less than 30% deliveries are institutional and < 80% mothers received one dose of TT as per DLHS 3. Our department has witnessed a sizable number of tetanus cases in last two years. So we conducted this retrospective study in Department of Pediatrics at SHKM GMC Mewat to know the clinical features, immunisation status, and source of infection and outcome of tetanus in children.

MATERIALS AND METHODS

This study was conducted in Department of Pediatrics at Shaheed Hasan Khan Mewati Government medical college Mewat. 41 patients of tetanus up to 14 yr admitted from January 2012 to Dec 2014 were studied retrospectively. This study was done after taking approval from institutional ethical committee. Data regarding the age, sex, and immunisation, source of infection, clinical presentation and outcome were collected from the case sheets of patients. Diagnosis of case was based on clinical features - presence of trismus, risus sardonicus, provoked or unprovoked spasms, features of autonomic instability in form of labile blood pressure, brady/tachycardia and a clear sensorium. All the cases were segregated to different grades based on Urwadia(1994) staging which is a prognostic scoring system based on trismus, severity of increased tone, respiratory involvement and features of dysautonomia.[6] Management of cases were done as per protocol which included wound care, antitetanus serum to neutralise toxins, antibiotics to eradicate microorganism. Patients were kept in isolation room, their spasms were controlled with intravenous diazepam which was given intermittently with or without phenobarbitone. Patients were kept nil orally in case of uncontrolled spasms and shifted to nasogastric feeds with improvement after few days. After 5 days of spasm free period sedating drugs were tapered and stopped. Patients were either discharged following tetanus toxoid immunisation or referred to higher centre for ventilator support in case of respiratory compromise.

RESULTS

During study period total of 41 patients were admitted out of which 9(21.9%) were neonatal tetanus. Neonatal tetanus (NT) Mean age of presentation was 8.2 days. Majority of neonates were male (77.7%). Home delivery was observed in 100% of cases. Maternal immunisation of tetanus toxoid (2 doses) was done in only one patient. As per prognostic scoring system (Urwadia 1994), majority of cases belonged to grade 3(77.7%) and grade 4(22.2%). The clinical spectrum of disease is mentioned in table 1. Mean duration of stay was 8.1 days. Mortality was observed in 44.4% cases.

POSTNEONATAL TETANUS

Out of the total number of 41 cases, 32(78%) belonged to post neonatal group. Mean age of presentation was 6.61 yrs. Fifteen (46.87%) patients were below 5yr of age. Male and female patients were equal in number. None of the patient was completely immunised for age. 6 patients (18.75%) had received one dose of DPT only. Source of infection was injury in 31.25% patients and otogenic in 21.87% patients. Average incubation period in these patients of injury was 6.4 days (range 2 – 20 days). Determining the incubation period in otogenic cases was not possible because of chronicity of the disease. Clinical features of these patients are depicted in table 1. Mean duration of stay was 10.7days. Mortality was observed in 5(15.62%) patients.

TABLE 1

Post neonatal Tetanus (n=32)			Neonatal tetanus (n=9)		
Characteristics	N	%	Characteristics	N	%
Male	16	50	Male	7	77.7
Female	16	50	Female	2	22.3
Immunisation(3 dosesDPT& boosters, TT)			TT doses (antenatal)		
Complete	0	0	2	1	11.1
Incomplete	6	18.75%	1	0	0

Unimmunised	26	81.25%	0	8	88.9
Source of infection			Source of infection		
Injury	10	31.25	Home delivery	9	100
Otogenic	7	21.87	Umbilical sepsis	3	33.33
Unknown	15	46.87	Head shaving	5	55.55
			Circumcision	3	33.3
Clinical features					
Trismus	32	100	Difficulty in feeding	9	100
Ophisthotonus	15	46.87	Ophisthotonus	7	77.7
Fever	7	21.87	Fever	2	22.2
Autonomic instability	7	21.87	Autonomic instability	7	77.7
Prognostic staging			Prognostic staging		
1	4	12.50	1	0	0
2	13	40.60	2	0	0
3	14	43.75	3	7	77.7
4	1	3.12	4	2	22.2
Outcome			Outcome		
Discharge	21	65.62	Discharge	2	22.2
Death	5	15.62	Death	4	44.4
LAMA	3	9.3	LAMA	2	22.2
Referred	3	9.3	Referred	1	11.1

DISCUSSION

Mewat is a rural underdeveloped district of Haryana which comprises of uneducated especially low female literacy rate, low economic status, families having many children. [7,8] Ignorance, negligence and prevalence of sociocultural taboos is very high among Meo population which besides causing harm and disease among the people, also contribute to poor statistics of health indicators of Haryana and country. So far as the immunisation status of the under 5 children (DLHS-3) data, Mewat occupies the bottom 5 position in the country. Our study has witnessed similar results were found. None of the patient in post neonatal group was fully immunised. Partial immunisation was seen in only 18% of cases who receive one dose of DPT.

Pregnant women who received tetanus toxoid immunisation were just 11.1% and none of the mother was delivered at hospital As per Haryana key indicators, these statistics are much lower in Mewat. As per the DLHS-4 data, 52.1% of children were fully immunised, out of which 51% coverage were in rural Haryana only. [9] None of the delivery was conducted in hospital which is contrary to the reports of DLHS-4 data of Haryana that percentage of institutional delivery is claimed to be 77% in Haryana and 74% in rural area. Therefore this area needs special mention as far as strengthening of implementation of immunisation programme and it requires very sincere efforts at every level in health care system.

Mortality in our study was 15.5% in post neonatal cases and 44.4% in neonatal cases. Causes of death in post neonatal cases were aspiration and cardio respiratory arrest in four patients, one patient died of refractory septic shock. Causes of mortality in neonatal tetanus were DIC in two patients, sudden cardio respiratory arrest secondary to arrhythmias and sympathetic over activity in one patient and one patient died of septic shock. High mortality in neonates was probably due to more severity of disease at presentation as suggested by Urwadia scoring and may be because of associated sepsis in neonates in 3 patients. Complications seen in NT were upper GI bleeding (33.3%) and sepsis (33.3%), aspiration pneumonia; and complications in PNT were aspiration pneumonia in 2cases and acute kidney injury in one patient. Complications were also more seen in neonatal cases and hence the higher mortality.

Poudel et al (2008) reported mortality in 40% and 20% cases in neonatal and post neonatal tetanus cases respectively which is much similar to our study[10]. Quddus et al (2002) found death in 38% of all neonatal cases.[11] Similarly in the post neonatal tetanus group Arbab ali et al(2012) reported same 18.24% cases which was conducted in Larkana, Pakistan in which 148 patients were studied in 2 year period[12], while Millind et al (2000) reported higher mortality 35% which was conducted in 40 PICU patients of Seth G. S Medical College and K E M Hospital Mumbai ,may be because of more severity of disease in these patients as 45% underwent tracheostomy and 35% underwent mechanical ventilation. [13] In spite of the decrease in prevalence, deaths from neonatal tetanus remained high, thus confirming the general opinion that neonatal tetanus mortality is high in developing countries and far from elimination.

Autonomic instability observed in our study was tachycardia, hypotension, and sudden cardiac arrest secondary to sympathetic over activity and cardiac arrhythmias. It was seen in 77.7% cases of neonates and 21.87% cases in post neonatal cases which were directly related to severity of disease. Fever was present in 22.2% NT cases and 21.87% cases which could be multifactorial. Fever could be as part of autonomic dysfunction alone or could be secondary to complication like lower respiratory tract infection or sepsis.

Injury was the commonest cause of tetanus in post neonatal patients followed by otogenic. Arbab ali et al also reported source of infection was wound in 60.8% of cases followed by otogenic cases[12]. While Mondel T et al(1994) reported 49% of otogenic cases followed by injury(29%)[14]. Otogenic mode of infection was again higher than injury cases in Millind S Tull et al study[13]. Source of infection in neonatal cases in our study were home delivery (100%) head shaving (55.55%), umbilical sepsis (33.3%) and circumcision (33.3%). Traditionally, circumcision is done by barbers, or quacks in majority of cases in this Mewat region of Haryana and there is culture of application of kajal, cosmetic powder, sindoor to the umbilical stump for early fall of the umbilical cord which may act as portal of entry for bacteria and hence the disease especially in setting where there is no antenatal vaccination of the mother. Goel A et al (2015) in his study on 317 patients in eastern India found that 76.47% babies developed umbilical sepsis secondary to application unclean substance and 13.7% developed neonatal sepsis following circumcision [15]. Poudel et al reported umbilical sepsis as cause of infection in all 5 neonatal cases included in this study of Nepal.[10]. Richard Onalo et al (2011) reported 80% home delivery in their study also which conducted in Nigeria, and umbilical sepsis and traditional uvulectomy were the attributing factors[16]. So these cultural taboos and illiteracy add to the burden of disease in developing countries.

CONCLUSION

This study may be showing the tip of iceberg of patients with tetanus in this area. Many patients may not be coming to us especially neonatal cases because of high birth rate, low literacy, low socioeconomic status, negligence and ignorance. We are approaching tetanus elimination but this pocket of Haryana needs very hard efforts as were done in eradicating polio to achieve our target and sincere notification of the disease.

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