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CLINICAL PROFILE OF 48 CASES OF TETANUS

General Medicine

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ABSTRACT

Tetanus is an acute disease caused by the exotoxin of Clostridium tetani. The incidence has decreased even in developing countries in recent years due to an effective vaccination program ,however, cases do occur in children of migrant workers and those living in remote areas who may have missed their childhood vaccines. Post-partum or neonatal tetanus is literally not seen nowadays in our country due to the efficient immunization of pregnant women.Adults, especially agriculture workers, are at high risk. The clinical profile of 48 cases of tetanus admitted over 3 years in GMC Aurangabad is presented in this study.

KEYWORDS

Tetanus, immunization, agriculture, migrant

Introduction

Tetanus is an acute disease caused by the exotoxin of Clostridium tetani and clinically characterized by muscular rigidity, punctuated by painful paroxysmal spasms of the voluntary muscles, especially the masseters[trismus or lock jaw], the facial muscles[risus sardonicus], the muscles of back and neck [opisthotonus] and those of the lower limbs and abdomen.[1]

Clostridium tetani is a Gram positive ,anaerobic, spore forming organism that can survive boiling for 15 minutes and can live in soil for months and years.The spores of tetanus are widely distributed in soil and intestine and feces of horses , sheep, cattle , dogs, cat, rats and chicken . Soil with manure contains large quantity of spores . Anaerobic conditions allow germination of spores and production of toxin . Clostridium tetani produces two exotoxins-Tetanolysin and Tetanospasmin .

Tetanospasmin causes clinical manifestations . The incubation period is 3-21 days, average 8 days [2] . Tetanus toxin blocks GABA [that has inhibitory action on motor neuron]. Motornerve activity thus becomes un checked and produce hypertonia and spasms[3]

Clinical features : Trismus[lock jaw] is an important early symptom. This lock-jaw is painless, unlike the spasm of masseters due to dental causes . Contraction of the frontalis muscle and muscles of mouth gives rise to "risus sardonicus ". The back is slightly arched and one hand can be passed in the gap between the bed and the back [Opisthotonus] . The abdominal wall has board like rigidity. In severe cases, spasms lasting for few seconds to 3-4 minutes may occur spontaneously due to stimuli, like light /moving the patient. These spasms are painful and exhausting and may involve the laryngeal muscles with serious consequences .Rarely, the only manifestation may be local tetanus – stiffness / spasms of muscles near the infected wound .The diagnosis of tetanus is clinical [4]

Tetanus is not transmitted from person to person . Commonly, tetanus is a disease of 5-40 years (active)age group . Agricultural workers are at special risk because of their contact with soil and it is commoner in rural areas .[5]

Types of tetanus :

1. Post trauma ; most important cause . Wounds may be trivial or even unnoticed.
2. Otogenic
3. Idiopathic
4. Puerperal
5. Neonatal [causes 4 and 5 are well controlled due to vaccination program of pregnant women][5]

Prognostic Scoring Systems in Tetanus, Grading of Severity [Urwadia 1994]

Grade 1 (Mild):	Mild to moderate trismus, general increased tone, no respiratory distress, no spasms, and no dysphagia
Grade 2 (Moderate):	Moderate trismus, marked rigidity, short lasting spasms, tachypnoea ≥ 35minute^{-1}, mild dysphagia.
Grade Three (Severe):	Severe trismus, generalised increased tone, reflex spontaneous or prolonged spasms, respiratory distress with tachypnoea ≥ 40minute^{-1}, apnoeic spells, severe dysphagia, tachycardia ≥120 minute^{-1}, moderate increase in autonomic nervous system dysfunction.
Grade Four (Very Severe):	Features of Grade III, plus severe autonomic dysfunction, persistent labile blood pressure and pulse rate.

Modified Patel and Joag Criteria for Grading Tetanus

Sign(s)/Symptoms(s)	Points
Rigidity	
Neck	1
Abdomen	1
Limb	1
Trismus	1
Spasms	
Less than 1/hour	2
More than 1/hour	4
Continuous/Laryngeal	6
Vital Parameters	
Temperature >38°C	2
Pulse >120/min	2
Respiratory rate >40/min	2

Grade–Mild: £ 3; Moderate : 4-10; Severe : >10

Treatment of Tetanus:

1. All wounds should be cleaned [5]
2. Injection Tetanus toxoid 0.5 ml im is given and booster after one month .[6]
3. Neutralise the absorbed toxin with Human Tetanus Antitoxin

[3000 IU][6]It is important to emphasize the booster.

4. Prevent further toxin production by debriding the wound .Give antibiotics like Ceftriaxone and Amoxycillin clavulinic acid .Metronidazole is a safe alternative which can be given per rectally or intravenously.[6]
5. Control spasms [7]- Benzodiazepines,Midazolam , Vecuronium, Phenothiazines like Chlorpromazine , Phenobarbital are useful in controlling spasms.[4].Giving muscle relaxants and placing the patient on a ventilator can be life-saving in critical cases.
6. Magnesium sulphate is a pre-synaptic neuromuscular blocker and is useful in reducing spasms as well as autonomic disturbances . It should be given till patellar tendon reflex is present .
7. Propofol is a GABA receptor modulator and may be useful in ICU setting .[8]
8. Percutaneous tracheostomy is a routine technique for severe tetanus that bypasses the larynx and prevents asphyxia due to laryngeal spasms.
9. Tetanus patient should be in a calm, dark environment and minimal handling is mandatory . [8]
10. Botulinum toxin may also be used for treatment of muscle rigidity and spasms associated with Tetanus [8]
11. Steroids are not indicated. Pyridoxine 100 mg per day is recommended in neonatal tetanus[4]

A major factor in the prevalence of tetanus in developing countries is no vaccination/ incomplete vaccination .The facilities available to manage severe cases have a major impact on mortality [4]

Tetanus antitoxin is actively transported by placenta from an immunized mother to her fetus, providing passive protection against tetanus for about 2 months of life after birth . Every pregnant woman should receive 2 doses of tetanus toxoid at 4 weeks interval.[9]

Complications of Tetanus :

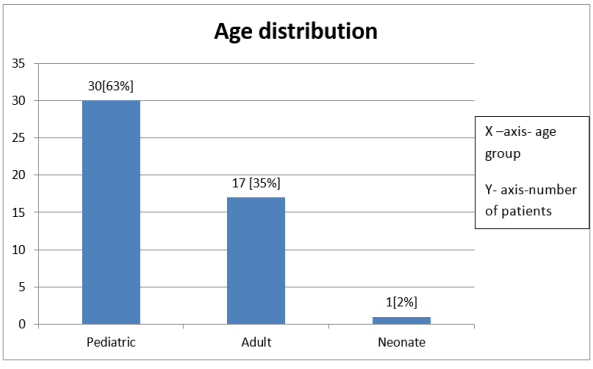
Tetanus can cause cardiovascular instability. Rapid fluctuations in Blood pressure and heart rate can occur. Sedation with intravenous Magnesium sulphate , calcium antagonists, short acting beta blockers may be useful.

Complications can occur due to treatment, eg thrombophlebitis due to diazepam, VAP, septicemia . Recovery can take 4-6 weeks . Afterwards, patient should be given full course of immunization.[10]

Observations :

We got the following results

No. of paediatric and adult patients(total 48):(Paediatric [1-12 years]30, 17 adults, 1 neonate)



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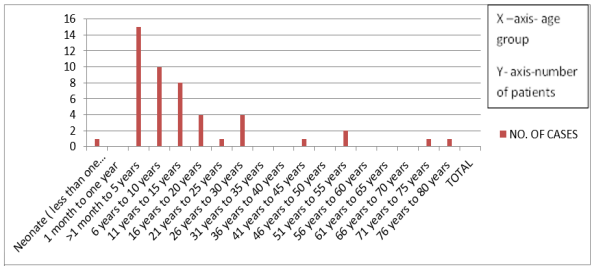
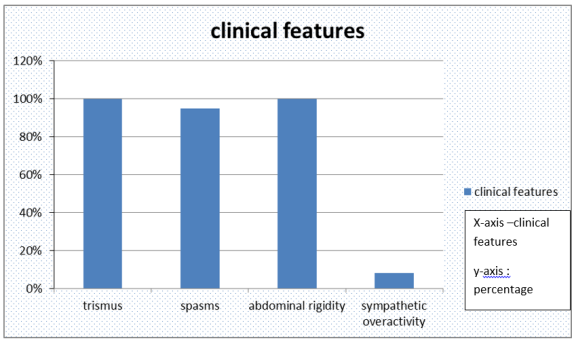
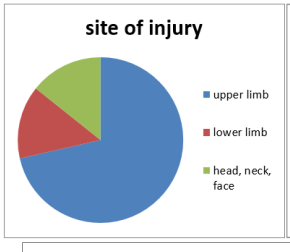


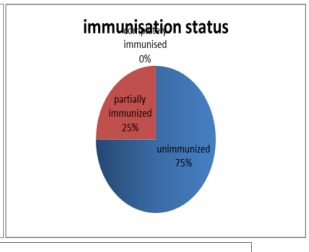


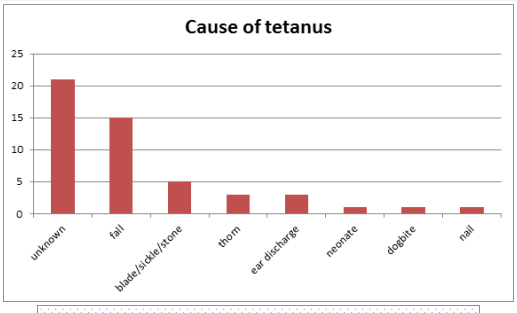
Types of tetanus:

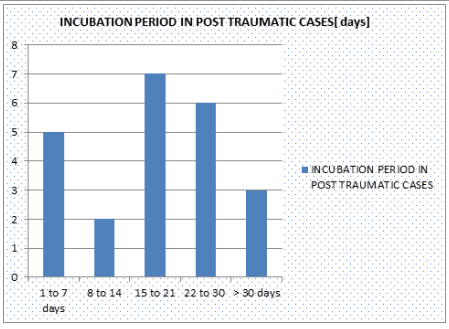
		No of patients	Outcome	
			Recovery	Death
1.	Neonate	1	100%	0%
2.	Traumatic	25	68%	24%
3.	Otitis	3	3	0
4.	Post partum	0	0	0
5.	Unknown source	19	73%	27%
6.	Local	0	0	0

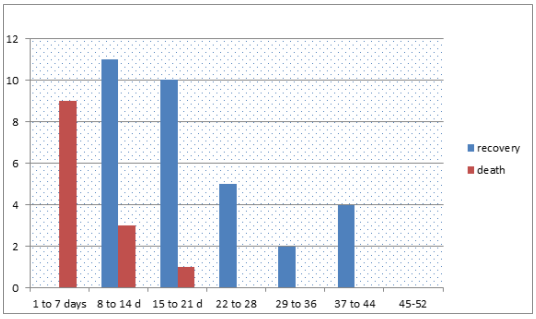
Photograph of child with tetanus



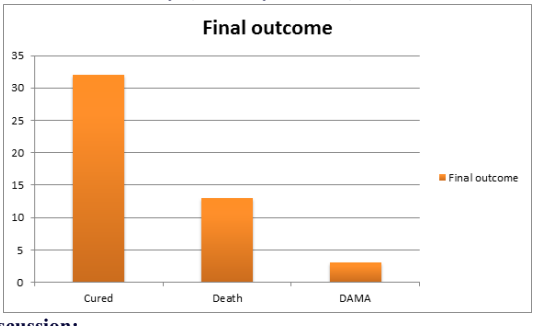








Course of illness in days(recovery or death)



Discussion:

We report a series of 48 cases of Tetanus admitted in GMC Aurangabad during 2013-2016 , when the first author , Dr Mangala Borkar Sonavani was Professor and Head, Department of Medicine, and the second and corresponding author Dr Mamta Muley was looking after infectious diseases unit in 2014-2015.

First case in -19 May 2013,Last case in – 29 April 2016

Youngest patient was 10 days old and oldest patient was 80 years old.
Below 12 years age 63 %, above 12 years age 35 %, 2% neonate
There were 47.92 % males, 52.08 %females
Tetanus is more common in males, which is not seen in this study.
Maximum number of cases were in age group of less than 5 years, 31.25 % of total cases

52.01 % of patients were post traumatic [majority from falls]. We did not get any case due to burns or injections. 3 cases had ear discharge.

During this period, we saw only one case of neonatal tetanus (who recovered). Majority of children belonged to parents who were migrant labor, in particular, involved in sugarcane cutting and transporting .All the patients were either totally unimmunized or had received partial immunization . Most of the parents presumed that one oral polio vaccine was "IMMUNIZATION ".They referred to it as " dose was given ".When we went into details, it was clear that oral polio was the only vaccine the child had received .Many pediatric patients had received one or 2 doses of OPV during pulse polio drive and their parents presumed that this itself was ' immunization '. None of the adults had been vaccinated.

This emphasizes the need of health education, particularly among rural poor, regarding complete vaccination.

All adults who have not been immunized previously should be given full course of immunization.The vaccine is given as 0.5 ml intramuscular, on deltoid. First dose on day 0, second dose after 1 month, third dose after 6 months to an unimmunized person.If the patient is vaccinated earlier , booster dose is needed if vaccination before 10 years[for clean minor wounds] and booster dose needed after 5 years for other wounds.[10]

Period of onset is the interval between the first symptom and development of spasm.

There was no case of post partum tetanus. Only one case of neonatal tetanus , a female child of 10 days old presented with neonatal tetanus (who recovered).

Average incubation period was 24 days.

Of these patients,100 % had trismus, 60.41 % had ophistotonus,100 % had abdominal rigidity, and 95.8 % cases had spasms.

25 % of patients were partially immunized for tetanus vaccine of whom 25 % died .

75 % were unimmunized of whom 35% died.

Most [26]patients /caretakers said that they were unaware of complete immunization .3 of adult patients who died, had been shifted to intensive care unit and ventilated , they had autonomic dysfunction and their BP and heart rate fluctuating frequently.The other 10 patients also died inspite of tracheostomy and intubation and ventilator support.
In post traumatic patients, minimum time required for recovery was 8 days, maximum time being 44 days.

Average duration for recovery was 20.18 days.

Death : two patients died within one day of admission and one died 19 days after admission .Average duration after admission of a patient to his death was 6.46 days.

Probable cause of tetanus in patients who died: injury-6, unknown-6,,one who died had retropharyngeal abscess.No case with otitis died.
In our study in post-traumatic cases where symptoms developed within 1-7 days of trauma, 3 recovered and two went home AMA , (of whom one child had almost recoverd). None of the patient in whom onset of symptoms was 7 days or less , died .None of the patients who had otitis died .Even the neonatal tetanus recovered and there was no post partum patient .

Summary :

1. 48 cases of tetanus admitted in GMCH Aurangabad were studied over 3 years , there was one case of neonatal tetanus and no cases of post partum tetanus .
2. None of the patients were properly immunized. 75% were unimmunized and 25% were partly immunized.
3. 95.8 % patients had spasms.All had trismus, abdominal rigidity and opisthotonus.
4. 30 belonged to pediatric age group and 17 were adults.
5. There were 23 male patients and 25 female.
6. Average age of pediatric patients was 5.35 years.
7. One patient was a 10 day old neonate.
8. 50% of the pediatric patients were under 5 years of age , maximum ,i.e 6 patients, were 2 years old
9. There were 25 post traumatic ,3 post otitis, one neonatal and 19 of unknown cause .
10. Average incubation period in post traumatic cases was 24 days . None of the patients with incubation period of 1-7 days died.
11. 32[67%] recovered , 3 went against medical advice[6%] , 13 [27%] died .
12. 50 % of the parents were not aware that receiving only polio vaccine is not complete immunization.

Conclusions

1. Tetanus is a totally preventable disease, if a child or adult is properly immunized. Awareness has improved significantly in last few years but it needs to improve further particularly among rural farmers and migrant workers [eg sugarcane related migrant labor in Maharashtra.]
2. Just as oral pulse polio vaccine is effectively campaigned and aggressive pulse polio drives are carried out, tetanus vaccine also needs to be taken to the doorstep of camps of migrant workers and to remote hamlets.
3. Parents often have the misconception that OPV is equivalent to total immunization . Aggressive health education is needed in this regard. Many of them were sugarcane cutters who move from place to place. They need to be educated about total number of doses/ vaccines that their child needs to take and they have to be told about the difference between OPV and DPT .
4. Intensive efforts are needed to immunize children of migrant workers and those staying in remote areas, as per the convenience of their parents. Vaccines should be given whenever the children are brought to a health facility regardless of which place they belong to .

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