

MORTALITY RATE IN ADULT TETANUS PATIENTS IN DISTRICT D. I. KHAN, NWFP - PAKISTAN

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This study was conduct to know about the real and present situation in our set up where tetanus still remains an important cause of morbidity and mortality despite free availability of a safe and effective vaccine. The study was conducted in medical unit of DHQ teaching hospital D. I. Khan over a period of four years. A total of 150 cases of tetanus were studied with 120 patients being males and 30 females. Diagnosis of tetanus was based on clinical examination. The patients were given conventional therapy for tetanus and comparison was made with other studies. Among these 150 patients of tetanus, 29 (19.3%) patient died, 22 being males and 7 females. Mortality rate in adult patients with tetanus is lower than reported in most other studies.

Key words: Tetanus, mortality, injury.

INTRODUCTION

Tetanus is known to the medical research workers since ancient times as a disease occurring after an injury. The causative agent is a Gram-positive, spore-forming, anaerobic bacillus i.e., *Clostridium tetani*. The organism releases a toxin, tetanospasmin¹, at the site of wound. Tetanospasmin travels to neuromuscular junction by intra-axonal transport within the central nervous system². It binds to the pre-synaptic membrane and blocks the release of inhibitory neurotransmitter Gamma Amino Butyric Acid (GABA), resulting in characteristic muscle spasm and rigidity³, as there is no inhibitory control to prevent sustained excitatory neuronal discharges⁴. Trismus or lockjaw is often the presenting symptom⁵, but onset of fits is the most distressing. Typically the course of disease is prolonged and muscular rigidity may persist for several months.⁶ Clinically it is almost impossible to determine which wounds are tetanus prone as it can occur after trivial injuries and is rare after severely contaminated wounds⁷. In 7-30% of patients no portal of entry is found⁸. Despite widespread availability of a safe and effective vaccine against tetanus, it is still a major problem world-wide. The main reason is lack of compliance and awareness of both patients and doctors. World-wide about one million cases of tetanus occur annually⁹, resulting in death of about half a million people each year¹⁰. In developing countries it is mainly a disease of neonates and young

children¹, whereas in developed countries it mainly affects people older than 65 years¹¹. With improvement in medical care, mortality rate from this disease has decreased¹²⁻¹⁴. One of the studies conducted in the past has reported a mortality rate of 43.5% in tetanus patients treated conservatively¹⁵.

The objective of this study was to determine the mortality rate in adult tetanus patients in our situation.

MATERIALS AND METHODS

The study was conducted at Department of Medicine District Headquarter Teaching Hospital D. I. Khan, over a period of four years i.e. from July 2001 to June 2005. Patients studied were those from District D. I. Khan, as well as from adjacent areas such as District Tank, Lakki, Bakhar, and South Waziristan and areas in the South East of Afghanistan. The total number of patients was 150. These patients were either admitted directly to our unit or were shifted from other units of the hospital or from other health units. The previous immunization status of these patients was unknown and their age range was 16-85 years (Mean 28 years). These patients were kept in separate, isolated, dark, well ventilated rooms. The most common symptoms were lockjaw, dysphagia and muscular rigidity. The criteria used by Bleck², were used for scoring the disease severity, which is based on six items, i.e.

Incubation period less than 7 days; period of onset less than 48 hours; high risk portal of entry; generalized tetanus; core temperature more than 40°C; tachycardia with heart rate more than 120/min. Each item is scored as 1 point. Cases having a score of 0 to 1 were labeled as mild, 2-3 moderate, 4 severe and 5 very severe tetanus. A high risk portal of entry was defined as a portal of entry associated with reduced chance of recovery such as entry associated with burns, surgical procedures, compound fractures, septic abortion, intramuscular injection or narcotic abuse.

The patients were given passive immunization by giving equine anti tetanus serum (ATS) in a dose of 50,000 units intramuscular and 50,000 units intravenously as soon as possible. Negligible number of patients received Human tetanus immune globulin (HTIG) in a dose of 500 units intramuscularly. This dose was selected so as to minimize the cost of therapy as this dose has been shown to be as effective as the larger doses¹⁶.

Active immunization by intramuscular administration of tetanus toxoid (TT) in a different limb from that in which ATS / HTIG was given, to provide protection against tetanus after any injury in future. The patients were given written instructions to complete the course of immunization according to the schedule i.e.; 2nd dose after one month, 3rd dose after 6 months and then booster doses every 10 years.

Diazepam, which is a benzodiazepine, and GABA agonist, was given 40-120 mg in 4-6 hourly divided doses depending upon the severity and frequency of symptoms, along with additional (as required) doses. Patients whose spasms were poorly controlled with diazepam were also given

intramuscular chlorpromazine 50 mg 8 hourly. Cleansing of wound with debridement of necrotic tissue and removal of foreign bodies was done if needed. Benzyl penicillin 10 million units in 6 hourly divided doses was given intravenously for 10 days after initial test dose to eradicate the causative organism. Those allergic to Penicillin were given Metronidazole 400 mg 6 hourly for a period of 10 days. In case of severely contaminated wounds and in patients with chest infections other antibiotics including Ceftriaxone were also used. In patients with feeding difficulties nasogastric intubation was done. Other supportive measures included, care of bowel and bladder and avoidance or treatment of bedsores. The data was recorded, analyzed and comparison was made with other studies.

RESULTS

In a total of 150 patients studied, 29 (19.3%) died that included 22 males and 7 female patients. In 65 (43.3%) patients the site of injury was the lower limb. In 35 (23.3%) patients upper limb was the site of injury. The contribution of puerperal cases and those following involvement of sites other than already mentioned was 9 (6%) and 15 (10%) respectively. In 26 (17.3%) patients there was no obvious evidence of injury. Among 134 patients with known history of injury 26 (17.3% of total) sought medical advice after the injury and in the remainder either the wound was not given attention or was managed by the patients themselves. Duration of hospital stay was from 4–32 days. Seven (24%) patients died because of septicaemia, 5 (17%) died due to respiratory infection, 3 (10.3%) died of cardio pulmonary

Table: Influence of various parameters upon mortality in tetanus.

Characteristics	Number of Patients	Percentage of Total	Mortality	Mortality Rate
Mild	47	31.3%	0	0%
Moderate	50	33.3%	5	10%
Severe	33	22%	11	33.3%
Very severe	20	13.3%	13	65%
< 40 years age	112	74.6%	15	13.4%
40-50 years age	23	15.3%	5	21.7%
>50 years	15	10%	9	60%
Male	120	80%	22	18.3%
Female	30	20%	7	23.3%
Total	150	-	29	19.3%

arrest and in 14 (48.3%) the cause of death was not determined. Regarding the severity of disease, 47 (31.3%) patients were having mild tetanus, 50 (33.3%) moderate, 33 (22%) severe and 20 (13.3%) had very severe tetanus. Age range was 15-65 years. One hundred and twelve (74.6%) were less than 40 years of age, 23 (15.3%) were 40-50 years old and 15 (10%) were more than 50 years old. One hundred twenty (80%) were males and 30 (20%) were females. Mortality was nil in cases of mild tetanus, 10% in moderate, 33.3% in severe and 65% in very severe tetanus. It was 13.4% in patients less than 40 years age and 60% in patients above the age of 50 years. Mortality rate in male and female cases was 18.3% and 23.3% respectively.

DISCUSSION

Among the patients referred to us from other areas, two patients were managed in a very strange and cruel manner by quacks before referral. Both of them were young females. One of them was labeled as a case of malingering and repeated forceful attempts were made to open her mouth until her condition became serious and was referred to us. In the other case the patient was treated by inducing multiple burns on her body because of belief that the condition was caused by a *jinn* (ghost). This approach further aggravated her condition before she was referred to us as a last resort. This reflects the ignorance regarding the disease in our area about a disease that is known since ancient times to be caused by injury. As both cases were female, it seems likely that females are either misdiagnosed or neglected in our setup and may escape detection. Thus the seemingly increased involvement of male sex i.e. 120 out of 150 may be partly a reflection of this attitude.

Another factor that can explain the increased tendency for the males to get affected by this disease is the more frequent exposure of males to various types of trauma. Also, the recent campaign by health authorities to vaccinate every pregnant lady for tetanus may be another factor responsible for a lower number of female patients in our study. However, among the 30 female patients 9 i.e. 6% were those of puerperal cases. This indicates that lack of maternal immunization and unhygienic delivery practices demand our continuous and increasing attention.

In this study 29 of 150 patients died. The overall mortality rate was 19.3%. This is in contrast to most of the previous studies reporting very high mortality rates. One of these studies has given a mortality rate of more than 90%⁸. Other studies have reported mortality rates of 69%¹⁷

35.7%¹⁸, and 35%⁹. However many other studies conducted recently have given lower mortality rates of 26.2%¹⁹ and 22%²⁰. A few studies have reported mortality rates even lower than the values obtained in our study, i.e. 11.3%²¹ and 10%¹.

However, the results obtained in our study are encouraging if we appreciate the fact that these were the results obtained with conservative treatment in a hospital where there were no advanced intensive care facilities. This probably reflects the increasing awareness about the management of the disease by both doctors and nursing staff providing optimum supportive treatment even with conventional methods. Another reason for lower mortality in our study may be the fact that majority of the patients i.e. 112 (74.6%) in our study were less than 40 years of age and only 15 i.e. 10% were more than 50 years of age, whereas in most of the previous studies almost all patients were more than 40 years of age^{1,22,23}. Even in our study mortality rate in age group more than 50 years was 60%. Increasing age is one of the factors associated with increased mortality in tetanus^{4,19}. With increasing age there is a gradual decline in performance of various systems and the chance of co-morbidity increases.

The reason of increased occurrence of disease before the age of 50 in our setup could be:

- i. Either the present adult population has not received childhood immunization or booster doses were not given after childhood immunization. In other countries this problem of inadequate immunity starts mainly in advancing age, either because they do not receive booster doses or because efficacy of booster doses decreases with increasing age.
- ii. We still have significant number of puerperal cases because of lack of immunization on one hand and unhygienic delivery practices on the other hand.

It was **concluded** that tetanus is still a common disease in adults of young to middle age. This disease is the result of infection and is preventable, as well as treatable, but common man in our area does not appreciate this fact. Hence health awareness and health education are very important. Mortality rate even with conservative management is lower than previously thought. Severity of the disease and advancing age are the main factors associated with increased mortality.

Although mortality rates between the two sexes is not significantly different, male patients outnumber female cases. Significant number of female cases is the result of poor delivery practices and lack of maternal immunization. Proper and

regular immunization of adults will not only prevent tetanus in adults but maternal immunization will also help prevent neonatal tetanus. The significance of booster doses every ten years after childhood immunization should not be under estimated.

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