

Clinico-epidemiological Study of Tetanus at District Headquarter Hospital, Faisalabad

Tariq Farooq, Muhammad Faisal Bilal Lodhi, Rana Israr, Muhammad Akram, Sumera Kanwal

ABSTRACT

Objectives: To study age, sex and regional frequency of tetanus. To define the status of immunization against tetanus. To find the outcome of the treatment provided.

Material and Methods: All the consecutive patients above 10 years of age with the clinical evidence of tetanus presenting at DHQ Hospital, Faisalabad were included in the study. Detailed history of the illness was obtained from the relatives. Physical examination carried out specifically looking for any evidence of injury. Associated co-morbid factors were noted and managed accordingly. Careful management of the tetanus was done in a separate unit with limited facilities.

Results: A total of 40 patients presented during one year of study with the clinical evidence of Tetanus. 28 patients were in between 10-30 years of

age, 12 were of more than 40 years of age. There were 29 (72.5%) males and 11 (27.5%) females. Most of the patients (87.5%) belonged to rural areas and only 12.5% were from the urban areas. 25 patients had no knowledge about their tetanus immunization status. 15 patients gave history of tetanus immunization in the past but none of them had a booster dose within last 10 years.

Conclusion: Male population belonging to rural areas is the commonest victims of tetanus. Most of them are affected during the 2nd and 3rd decades of life. There is a complete lack of knowledge about the tetanus immunization. Standard management of tetanus at dedicated centers with facilities for artificial ventilation can save many lives.

Key Words: Tetanus, Tetanus immunization

INTRODUCTION

Tetanus is an illness characterized by an acute onset of hypertonia, painful muscular contractions (usually of the muscles of the jaw and neck), and generalized muscle spasms without other apparent medical causes. It is a serious but preventable disease. It typically arises from a skin wound that becomes contaminated by *Clostridium tetani*, which is often found in soil [1, 2]. In the body bacteria produce Tetanospasmin, a neurotoxin, responsible for the clinical manifestations of tetanus. Per weight, tetanospasmin is one of the most potent toxins known. The estimated minimum lethal dose is 2.5 nanograms per kilogram of body weight (a nanogram is one billionth of a gram), or 175 nanograms for a 70-kg (154-lb) human [2]. The neurons, which release gamma-aminobutyric acid (GABA) and glycine, the major inhibitory neurotransmitters, are particularly sensitive to tetanospasmin, leading to failure of inhibition of motor reflex responses to sensory stimulation. This results in generalized contractions of the agonist and antagonist musculature characteristic of a tetanic

spasm. Once the toxin becomes fixed to neurons, it cannot be neutralized with antitoxin. Recovery of nerve function from tetanus toxins requires sprouting of new nerve terminals and formation of new synapses. This is the time when patient needs supportive care in the form of anticonvulsants, sedation, and respiratory assistance [3, 4, 5].

Most cases of tetanus follow a cut or deep puncture injury, such as a wound caused by stepping on a nail. Sometimes the injury is so small the person never even sees a doctor. Wounds contaminated with soil, saliva, or feces especially if not properly cleaned, and skin punctures from non sterile needles (such as with drug use or self-performed tattooing or body piercing) are also at increased risk [6]. Vaccination has been the principal means of tetanus prevention [7]. Trend analyses for sex- and age-specific rates suggest a change of exposure, presumably linked to the involvement of the male population in outdoor activities especially during 2nd and 3rd decades of life. Regional data show remarkable variability in prevalence of susceptible population. Urban population shows less cases of tetanus as compared to the people

belonging to rural areas. Different degrees of regional underreporting in case notification is also responsible for alarming rise of deaths due to tetanus [8].

Tetanus in general is rare in the developed countries and nations with effective tetanus vaccination programs. However, many developing countries like India and Pakistan have less effective prevention and immunization programs against tetanus, so the disease is much more common here. In addition there is lack of awareness about the disease.

MATERIAL AND METHODS

A total of 40 patients presenting with the clinical evidence of Tetanus were included in the study. Detailed history of the illness was obtained from the relatives. Professional history, history of injuries, child birth, abortion and any surgical intervention in the recent past was asked about. Health facilities where they were treated were noted to have an idea about the level of care provided and if that facility was aware of tetanus prophylaxis. All the patients were investigated about the vaccination against tetanus. The timing of booster dose, if any, was also asked. Physical examination carried out specifically looking for any evidence of injury or surgical procedure. Associated co-morbid factors were noted and managed accordingly. Patients were managed in a separate unit with dark room under strict isolation. Intravenous sedation, antibiotics and immunoglobulins were given where indicated. Patients with severe respiratory difficulty underwent tracheostomy with assisted ventilation.

Severity of disease was graded as under:

Mild: Trismus (lockjaw), dysphagia

Moderate: Opisthotonus, No respiratory distress

Severe: Trismus, Opisthotonus, Respiratory distress requiring tracheostomy and assisted ventilation.

Wounds, if any, were properly debrided and dressed. Antibiotics were administered empirically and changed according to the result of pus culture and sensitivity.

Setting: This descriptive study was carried out at District Headquarter Hospital, Faisalabad affiliated with Punjab Medical College, Faisalabad. Total duration of study is one year (January 2008 to January 2009).

Inclusion Criteria: All the patients, above 10 years of age, with the clinical evidence of tetanus presenting at DHQ Hospital were included in the study.

Exclusion Criteria: Children less than 10 years of age and cases of tetanus neonatorum were excluded from the study.

RESULTS

A total of 40 patients presented during one year of study with the clinical evidence of Tetanus. Among these patients 03 were of 10 years of age. 14 were from 11-20 years of age. 11 were from 21-30 years of age. 05 were from 31-40 years of age. And 07 were 41-50 years of age. (Fig 1)

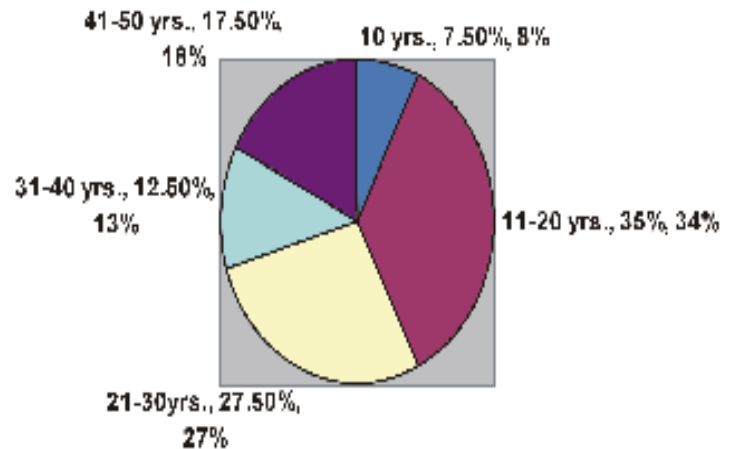


Fig. 1:

Among the total of 40 patients studied, 29(72.5%) were males and 11(27.5%) were females with approximate Male to Female ratio of 1:3(Fig 2)

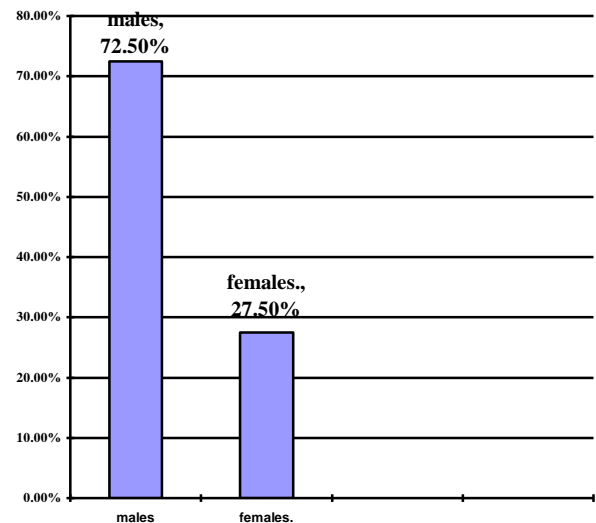


Fig. 2:

Majority of the patients (87.5%) with tetanus belonged to the rural population as shown in the Figure 3.

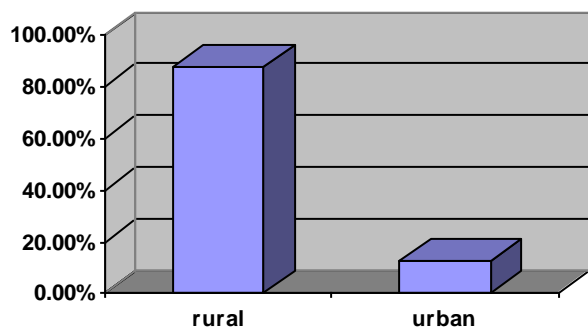


Fig. 3:

Amongst all the patients studied, 26(67.5%) got accidental injury, two (5%) developed tetanus after minor surgery from some quack. Two (5%) females had clinical tetanus after home delivery by dai, two (5%) after induced abortion at a primitive health facility by untrained staff. Six of the male patients (15%) used to work bare footed in the fields. One male patient was found to be an i/v drug addict and one developed tetanus after firearm injury to the lower limb.(Fig 4)

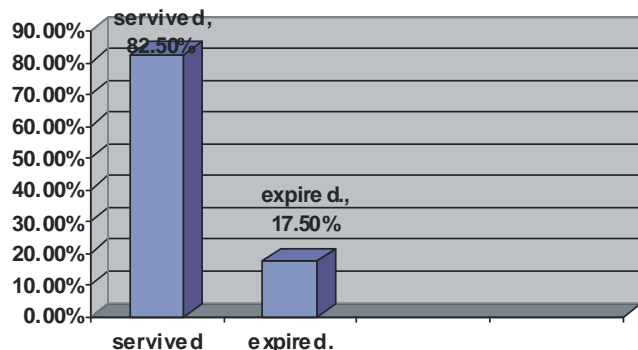


Fig.4:

On interrogating for the tetanus immunization, 25 patients had no knowledge about their tetanus immunization status. 15 patients gave history of tetanus immunization in the past but none of them had a booster dose within last 10 years.

DISCUSSION

Tetanus is a serious but preventable disease. Tetanus usually follows a cut or deep puncture injury, such as a wound caused by stepping on a nail. Sometimes the injury is so small the person never even sees a doctor. Wounds contaminated with soil, saliva, or feces especially if not properly cleaned, and skin punctures from non sterile needles (such as with drug use or self-

performed tattooing or body piercing) are also at increased risk[9]. Most of the patients (67.5%) in our study acquired tetanus following trauma which was mainly occupation related like injuring their feet while working bare footed in the fields, toka injures, and road traffic accidents. Majority of the patients (87.5%) with tetanus belonged to the rural population where health facilities are not adequate. Most of the female patients felt victim to tetanus due to gynecological procedures undertaken in poorly equipped medical centers by non-professional paramedics / quakes.

Higher number (72.5%) of male patients with tetanus in our study is due to the fact that they are the working group exposed to all types of outdoor trauma. Majority of women stay inside the home and are not to involved in such type of activities. A study from our neighboring country Iran also shows more males affected by tetanus than females with female: male ratio of 1:3 in all the age groups [10].

Majority of the male patients in our study were in their 2nd and 3rd decades of life. It is due the fact that this age group is the most active in the professional and non-professional activities susceptible to injuries. From 1980 through 2000, 70% of reported cases of tetanus in the United States were among persons aged 40 years or older. Of all these patients, 36% are older than 59 years and only 9% are younger than 20 year8. In the developed countries like USA men are believed to be better protected than women, perhaps because of additional vaccinations administered during military service or professional activities. The incidence of tetanus in these countries increases with advancing age. It is due to the fact that the elderly population is usually left unattended and isolated with increased risk of accidental injuries and neglected treatment.

Lack of awareness about tetanus immunization has been noted to be one of the main factors responsible of the increased cases of rural males developing this illness. Twenty five patients had no knowledge about their tetanus immunization status. 15 patients gave history of tetanus immunization in the past but none of them had a booster dose within last 10 years. In addition to Expanded Program on Immunization by WHO, a vaccination programs directed towards adult population should also be developed [4, 11].

All the patients (17.5%) who had severe clinical disease at the time of presentation expired, whereas 82.5% patients with mild and moderate illness survived and discharged after completion of treatment. We managed all these patients in a separate Unit. The

ventilatory support facilities are limited in this Unit. In addition to overall poor prognosis in severe illness, limited resources also play a part in increased mortality seen in these cases [12, 13].

CONCLUSION

Male population belonging to rural areas is the commonest victims of tetanus. Most of them are affected during the 2nd and 3rd decades of life. There is a complete lack of knowledge about the tetanus immunization. Standard management of tetanus at dedicated centers with facilities for artificial ventilation can save many lives.

REFERENCES

1. Pascual FB, McGinley EL, Zanardi LR, et al. Tetanus surveillance--United States, 1998--2000. *MMWR Surveill Summ.* Jun 20 2003;52:1-8.
2. Groleau G. Tetanus. *Emerg Med Clin North Am.* 1992;10:351-60.
3. Ahmadsyah I, Salim A. Treatment of tetanus: an open study to compare the efficacy of procaine penicillin and metronidazole. *Br Med J (Clin Res Ed).* 1985;291:648-50.
4. Richardson JP, Knight AL. The management and prevention of tetanus. *J Emerg Med.* 1993;11:737-42.
5. Sanders RK. The management of tetanus 1996. *Trop Doct.* 1996;26:107-15.
6. Galazka A, Gasse F. The present status of tetanus and tetanus vaccination. *Curr Top Microbiol Immunol.* 1995;195:31-53.
7. Kretsinger K, Broder KR, Cortese MM, et al. Preventing tetanus, diphtheria, and pertussis among adults: use of tetanus toxoid, reduced diphtheria toxoid and acellular pertussis vaccine recommendations of the Advisory Committee on Immunization Practices (ACIP) and recommendation of ACIP, supported by the Healthcare Infection Control Practices Advisory Committee (HICPAC), for use of Tdap among health-care personnel. *MMWR Recomm Rep.* 2006; 55:1-37.
8. Izurieta HS, Sutter RW, Strebel PM, et al. Tetanus surveillance--United States, 1991-1994. *MMWR CDC Surveill Summ.* 1997;46: 15-25.
9. F. Rosmini, M. Wirz, G. Gentili et al. Year of birth, sex and residence, as determinants of tetanus incidence and immunity in Italy. *European Journal of Epidemiology.* 1987; 3: 377-80.
10. Parviz Khajehdehi, Gholam-Reza Rezaian .Tetanus in the Elderly: Is It Different from That in Younger Age Groups? *Gerontology* 1998; 44:172-175.
11. Oztürk A, Göahmetoğlu S, Erdem F, Mýsgüroğlu Alkan S. Tetanus antitoxin levels among adults over 40 years of age in Central Anatolia, Turkey. *Clin Microbiol Infect.* 2003;9:33-8.
12. Checketts MR, White RJ. Avoidance of intermittent positive pressure ventilation in tetanus with dantrolene therapy. *Anaesthesia.* 1993;48: 969-71.
13. Knight AL, Richardson JP. Management of tetanus in the elderly. *J Am Board Fam Pract.* 1992;5:43-9.

AUTHORS

- **Dr. Tariq Farooq**
Associate Professor
Surgical Unit-IV
DHQ Hospital, Faisalabad
- **Dr. Muhammad Faisal Bilal Lodhi**
Associate Professor
Surgical Unit-III,
Allied Hospital, Faisalabad
- **Dr. Rana Israr**
Senior Registrar
Surgical Unit-I,
Allied Hospital, Faisalabad
- **Dr. Muhammad Akram**
Assistant Professor,
Surgical Unit-III,
Allied Hospital, Faisalabad
- **Dr. Sumera Kanwal**
Senior Registrar,
Surgical Unit-III,
Allied Hospital, Faisalabad