Prevalence of Tetanus in Adult Patient During one Year in Infectious Disease, Kabul Hospital, Afghanistan

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Abstract

Tetanus quiet remains a major public health problem in Afghanistan like in most other developing countries, with a high morbidity and mortality. To study the demographic profile and the clinical profile that they presented with, as well as the outcome of the tetanus patients who were admitted to the Infectious, Disease Hospital, and Kabul Afghanistan. The data of all the patients of tetanus who were above the age of 15 years, who were admitted from March 2018 to March 2019, were collected, compiled and analyzed from the Medical Records of each case at Hospital. Out of the 23 cases of tetanus, 23 (100%) were males and 0 (0%) were females. Their ages varied from 25 to 35 years. The overall mortality rate was 52.17% and of 11 (47.82%) patients were cured. Regarding to occupation 18(78.26%) patient were farmer, 5(21.73%) were carpenter. Among all patient 21(91.3%) had positive history of inferior and superior extremities injury and remain 2(8.7%) had unknown history. None of the patients had taken tetanus immunization. The prevalence of adult tetanus and case fatality was consistent with the impact of routine and supplementary immunization activities. Although men were at high risk of tetanus infection, our analyses show that there is an underlying burden of tetanus among adolescent and adult men who have been largely missed by vaccination programs. In addition to strengthening tetanus toxoid immunization coverage, health education focusing on increasing awareness of NT could help reduce NT mortality.

Keywords: Tetanus, Mortality, Infectious Disease

Introduction

Tetanus is still a common disease in developing countries and has a high mortality rate.(1) The tetanus which is caused by a spore forming bacterium, Clostridium tetani, is an acute and often a fatal disease that is characterized by a generalized increased rigidity and convulsive spasms of the skeletal muscles.Tetanus is a non-communicable disease and it is not transmitted from person to person.The global incidence of tetanus is estimated to be one million cases annually, with a case fatality rate which ranges from 6% to 72%, depending on the availability of well-equipped intensive care units.(2) tetanus remains a public health problem in many parts of the world and is often fatal, even within modern intensive care facilities.(3) The most common presenting symptom of tetanus is trismus, and the disease is diagnosed primarily through clinical presentation rather than through bacteriological culture(4). The bacterium is commonly

found in the environment (usually in soil, dust, and animal waste) . Tetanus spores can enter the body through cuts or abrasions (5).following contact with damaged skin and mucous membranes, the spores enter the body and become endospores in the local anaerobic environment, producing and releasing a large amount of tetanus toxin the contamination of wounds with the spores of C.tetani is probably a frequent occurrence. Their germination and the toxin production, however, take place only in the wounds with a low oxygen-reduction potential, such as those with devitalized tissue, foreign bodies, or active inflammation. The toxin which is released in the wound binds to the peripheral motor neuron terminals, it enters the axon, and it is transported to the nerve-cell body in the brain stem and the spinal cord by a retrograde intraneuronal transport. The toxin then migrates across the synapse to the presynaptic terminals, where it blocks the release of the inhibitory neurotransmitters, glycine and gamma aminobutyric acid (GABA) from the vesicles. The blocking of the neurotransmitter release by tetanospasmin, results in a diminished inhibition due to which the resting firing rate of the alpha motor neuron increases, thus producing rigidity. The loss of inhibition of the preganglionic sympathetic neurons may produce a sympathetic hyperactivity and high circulating levels of catecholamins [6]. The muscle tone is increased, thus producing the characteristic trismus, risus sardonicus, and the opisthotonus. The spasms typically develop one to four days after the initial symptoms. The wounds do not need to be obviously contaminated for tetanus to develop, and in unvaccinated individuals or in people with a waning immunity, even minor wounds can cause a fatal disease. Tetanus is a non-communicable disease and it is not transmitted from person to person (7).

Methodology

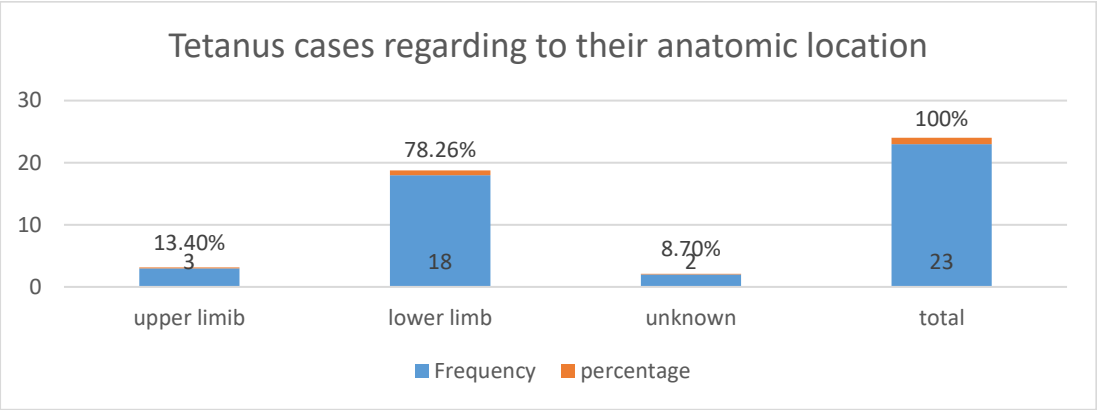
This was a one year hospital based, prospective, record based study which was done on adult patients who presented with tetanus to the infectious disease Hospital, Kabul (Afghanistan), between March 2018 and March 2019. This study included all patients of all age groups and both sexes with a clinical diagnosis of tetanus. The diagnosis of tetanus was entirely clinical and based on the presence of one or more of the following: (1) trismus, (2) rigidity of the neck and/or abdomen, and (3) reflex spasms [4]. Rigidity and/or spasm limited to a wound-bearing area of the body was defined as localized tetanus; trismus and generalized rigidity with or without generalized spasm were defined as generalized tetanus. This is a referral hospital for infectious diseases, which is run by the Government. The hospital serve to the people of Kabul and the neighboring province as well referred from different provinces of Afghanistan. The consultation, the ward charges and the drugs are provided free of cost. The hospital has 100 beds which include those in the isolation wards for the tetanus patients, excluding those in the intensive care units. A consent was obtained from the hospital chairman and ethical committee and also verbally from patient and in the case of un concisouces from their relative and the data were collected and were entering to previous prepared questioner to the start of the study.

Study Subjects the study included all the patients above the age of 15 years, who were clinically diagnosed to be suffering from tetanus. Details of the demographic data, occupation, seasonal variation, related complications, and the outcome were obtained from the medical records and they were entered in a questionnaire before their analysis.

Statistical analysis: The statistical analysis was performed by using the EPI INFO software package 6.04 version. The percentages were calculated for the various parameters which were under study.

Results

The demographic Profile a total of 23 patients were treated during the study period of March 2018 to March 2019.Out of 23 (100%) were males and 0 (0%) were females. Their ages varied from 25 to 35 years. Portals of the entry and the Type of Injury Acute injuries like pricks, puncture wounds and lacerations were the most common portals of entry in 21 (91.3%) cases. The other portals of entry included road traffic accidents (RTA), bites, burns, fissures of the foot .The portals of entry were not identified in 2 (8.7%) patients. The most common anatomical site of the injury was the lower limb i.e. in 18 (78.26 %) patients [Table/Fig-1]. Outcome Of the total 23 patients, 11 (47.82%) survived, 12(52.17%) died [Table/Fig-2]..The case fatality rate was 52.1%. length of staying in the hospital for over 7 days or more were 14(61%) and 9(39%) length of staying in hospital were less than 7 days the mean days of staying in hospital were 7days. [Table/Fig-3]. Regarding to occupation 18(78.26%) patient were farmer, 5(21.73%) were carpenter. According to seasonal variation the most cases were in spring, summer and fall and less cases were in winter 7(30.43%), 9(39.13%), 5(21.74%) and 2(8.7%) respectively. [Table/Fig-4]. Regarding to immunization history no one of them had taken the tetanus toxoid and weren't immunized against tetanus.



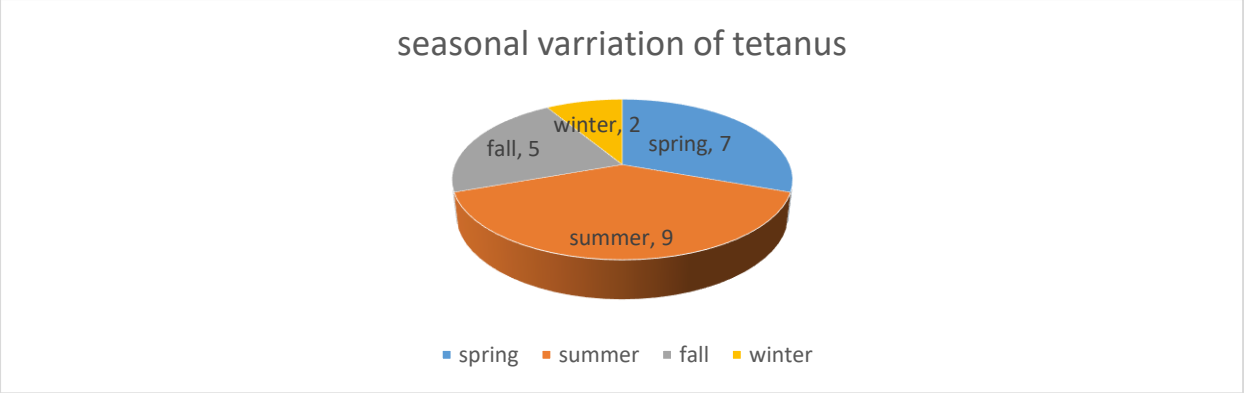
[Tab/Fig-1]: tetanus cases regarding to their anatomic location in the tetanus patients.

outcome	Frequency	percentage
cured	11	47.82%
died	12	52.17%
total	23	100%

[Tab/Fig-2]: tetanus patient regarding to their outcome.

length of hospital stay	Frequency	percentage
less than 7days	9	39%
more than 7days	14	61%

[Tab/Fig-3]: tetanus patient regarding to length of staying in hospital.



[Tab/Fig-4]: seasonal distribution of tetanus cases.

Discussion

In our study, the majority of patient were in (25-35) age interval, and most of them were born before 1995. In that time there was civil war in Afghanistan with damaged infrastructure and there was not EPI implantation program, Participants had not been immunized with tetanus vaccine. In our study we found all patients were male and there was no female case was recorded the main cause is men have responsibility to earn money and they exposed every time to higher risk during work. In our study, and a research showed that no one of the patient had vaccination history against this fatal and infectious disease Therefore, it is necessary to improve tetanus immunity among adults or posttraumatic patients as well as groups with an unknown early immunization history to further reduce the incidence of tetanus. In this study, there were 21 adult patients, and all of these cases were associated with positive wound and trauma history the most of them were in lower limb and upper limb and the remain two cases had unknown history regarding to their duty the most of them were farmer and carpenter . By 2015, approximately 56,000 people worldwide have died due to tetanus, with a mortality rate in South Asia and sub-Saharan Africa of 79% (7). However, the mortality rate of tetanus in developed countries is relatively low. Among the 499 patients admitted to tetanus in Japan from 2010 to 2016, only 34 (7%) died (7) In our study, only 12 adults (52.17%) died from tetanus, which was basically the same as the mortality rate in developing countries(Pakistan ,India and Ethiopia) and significantly higher than that in other developing countries (7) Nonetheless, the small number of patients included in this study cannot well reflect the current situation of tetanus in Afghanistan, and more clinical studies should be performed in the future. In our study we found the majority of patient had generalized tetanus with less than 10days incubation period and out of 23patient 3 had comorbid factors like diabetes and hepatitis and had the same complication (aspiration pneumonia, cardio laryngospasm, vascular instability and renal complication) with higher mortality rate in above 60 year of age our study result was same as other retrospective study which was carried in Ethiopia, Pakistan and India in above 13 years old patient. (8, 9, 10).

Conclusions

The prevalence of adult tetanus and case fatality was consistent with the impact of routine and supplementary immunization activities. Although men were at high risk of tetanus infection, our analyses show that there is an underlying burden of tetanus among adolescent and adult men who have been largely missed by vaccination programs. In addition to strengthening tetanus toxoid immunization coverage, health education focusing on increasing awareness of TT vaccination could help reduce tetanus mortality.

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