



Knowledge of tetanus vaccination among undergraduate medical students in Karachi, Pakistan

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ABSTRACT:

Tetanus is a serious bacterial disease that affects your nervous system, leading to painful muscle contractions, particularly of your jaw and neck muscles. A vaccine can prevent tetanus which can be given as a part of routine childhood immunization. Adults should get a tetanus shot, or booster, every 10 years. Our objective was to assess the knowledge about tetanus vaccination among undergraduate medical students.

A cross sectional survey was conducted in two renown medical colleges of Karachi named Dow Medical College and Sindh Medical College from February 2013 to January 2014. Undergraduate Students were included in the study which used a self-reporting questionnaire as its tool.

There were 317 undergraduate students interviewed by the study. Most of the respondents had known or heard about Tetanus (n=261;82.3%), half of the students above 20 years of age (50%) and half of the students from 17-20years

(50%) have sufficient knowledge about the fatality of disease and the benefit of post exposure prophylaxis. A total of 80 males and 237 females were questioned out of which 36(27.7%) of the male and 94(72.3%) of the females have adequate understanding of the tetanus.

Minor injuries and fall are a common occurrence in Karachi. Most of the participants were aware of the fatality of this disease and the significance and accessibility of vaccination in case of injuries and trauma.

Keyword: Tetanus; undergraduates students; immunization; knowledge;

INTRODUCTION:

Tetanus is an acute, destructive often lethal, disease with dire consequences mediated by an exotoxin and highly potent neurotoxin, tetanospasmin, formed during the growth lag phase of the anaerobic bacterium *Clostridium tetani*. *Cl. Tetani* is not an invasive organism; infection with *Cl.tetani* however remains



restricted. Tetanus spores are widespread in the environment which is usually the source of infection. Tetanus bacilli can also enter the body through contaminated puncture wounds and sometimes seemingly trivial injuries⁽¹⁾. Once inside neurons, tetanus antitoxin cannot neutralize the tetanus toxoid. In the central nervous system, toxin piles up and prevents the release of inhibitory neurotransmitters, such as glycine and gamma amino butyric acid (GABA), there by leaving excitatory nerve impulses unopposed⁽²⁾. In neonates, unhygienic birth practices, results in tetanus most commonly when its spores contaminate the umbilical cord mostly at the time of its cutting and dressing after delivery. It is a life threatening disease for newborns, with a case fatality rate of 70 to 100 percent⁽³⁾. Behaviors such as safe delivery practices, training of the traditional birth attendants (TBA) and immunization with tetanus toxoid (TT) are important factors affecting the incidence of tetanus⁽⁴⁾. The neonatal tetanus elimination program therefore aims at the immunization of women of childbearing age with tetanus toxoid as its primary focus⁽⁵⁾. Wounds can be divided into categories A and B based on the type and duration of wounds. Category A wounds are defined as wounds that were less than 6 hrs old, clear, non penetrating and with negligible tissue damage; category B included all other types of wounds⁽⁴⁾. Prevention of wound related tetanus is primarily through the administration of the toxoid along with the use of Human Tetanus Immunoglobulin (HTIG) depending on the risk of the wound to develop tetanus⁽⁶⁾. The normal dose of tetanus vaccine is 500-1000 IU/Kg which is given intramuscularly⁽⁷⁾. According to the World

Health Organization (WHO), six doses of TT containing vaccine within the age of 16 years provide lifelong immunity against the disease. In one study conducted in Kolkata, India; 57.4% interneers didn't know about the recommended doses of tetanus vaccine in children under 16 years and 76.8% interneers were not aware of the recommended doses of tetanus vaccine in adults over 16 years⁽⁶⁾. In another study in Delhi, low level of knowledge about tetanus vaccine was found among health professionals that is; More than one-third of doctors were not aware of protective duration of immunity as only 38.3% favored administration of TT after every injury⁽⁹⁾. Therefore better TT awareness of tetanus prophylaxis recommendations are necessary which may be more effective if they are better adhered to at the ED and the other departments that are involved in providing tetanus prophylaxis to their patients. The objective of our study was to assess the knowledge about tetanus vaccination among undergraduates medical students where 27.7% males and 72.3% females were aware of the fatality of the disease.

METHOD:

It is a descriptive cross-sectional study conducted among undergraduates of Dow Medical College and Sindh Medical College. An extensive search of the literature available on the internet did not reveal any information regarding the prevalence of knowledge about tetanus immunization among undergraduates in a medical college. The sample size calculations were thus based on the assumption that 50% of the students had the correct knowledge regarding the immunization guidelines. The data collection tool was a self-reporting

questionnaire which took about 10 minutes to complete. The questionnaire consisted of following components namely ; the undergraduates profile, evaluation of the their knowledge regarding the dosages of tetanus vaccine, the types of injury that are tetanus prone and TT and DTaP administration in relation to various types of wounds according to the immunization status of the patient. Knowledge was labeled as adequate if respondents rightly answered 5 to 8 questions out of 10 that is 50% or more questions related to their knowledge. Respondents who answered less than 50% questions were labeled as having poor knowledge.

ANALYSIS:

Data analysis was done by SPSS (Statistical Package of Social Sciences) version 21.0. Result was presented in mean \pm SD, frequency and percentage. Chi square test was used to test the association between knowledge and independent variables.

RESULTS:

Out of 317 students who participated in the study , 80(25.2%) were males of which only 36 (27.7%) had sufficient knowledge about tetanus and 237(74.8%) were females of which 94 (72.3 %) had knowledge of tetanus. . The mean age of students was 20.18 ± 1.30 years. Among participating 169(53.3%) students belonged to DMC and 148 (46.7%) belonged to SMC with the p-value for the respective institutes of 0.014.

Table 1. summarized questionnaire

| Q1 | Have you ever heard about tetanus injection | 1. Yes 2. No |
|----|---|---|
| Q2 | Tetanus used in how much time after injury | 1. 24 hour 2. Week 3. Month 2. I do not remember |

| | | |
|-----|---|---|
| Q3. | When is it compulsory to use tetanus injection | 1. After a fall 2. Road accident 3. Wound with metal 4. All of above |
| Q4 | In what kind of wounds tetanus injection used | 1. Open wounds 2. Closed 3. Do not know |
| Q5. | Aware of consequences in absence of tetanus in 24 hour | 1. Yes 2. No |
| Q6 | Any idea about DTaP booster | 1. Yes 2. No |
| Q7 | Age at which DTaP is applicable | 1. Below 7 years 2. Adult age 3. Old age |
| Q8 | In your opinion DTaP is the only vaccine used against tetanus | 1. Yes 2. No 3. I don't know |
| Q9 | How lasting a tetanus booster is | 1. 5 years 2. 10 years 3. I don't know |

We targeted two age groups for our study that were 17-20 years and > 20 years for which the p-value is <0.001 . Among these groups the ratio of students having correct knowledge about tetanus was 1:1 that is 65(50%) and 65(50%) .

Table 2. General characteristics of undergraduates who participated in the study

| Characteristics | n | % |
|---------------------------|------------------|------|
| Age (years) Mean \pm SD | 20.18 \pm 1.30 | |
| Institute | | |
| DMC | 169 | 53.3 |
| SMC | 148 | 46.7 |
| Gender | | |
| Male | 80 | 25.2 |
| Female | 237 | 74.8 |

The participants were categorized in three classes upper, middle and below middle , in which the acquaintances for tetanus were 21(16.2%) , 101(77.7%) and 8(6.2 %) . In further evaluation of our study were the groups of students well aware of routine vaccines other than tetanus such as polio and hepatitis , and the p-value for this is 0.001 .

Table 3. comparison of sufficient knowledge over insufficient based on above characteristics

| characteristics | Sufficient knowledge about | insufficient knowledge about | Chi square test | P-value |
|-----------------|----------------------------|------------------------------|-----------------|---------|
| | | | | |

| | tetanus | | tetanus | | value | |
|--------------------|---------|------|---------|------|--------|--------|
| | n | % | n | % | | |
| Age groups | | | | | 19.791 | <0.001 |
| 17-20 | 65 | 50 | 139 | 74.3 | | |
| >20 Years | 65 | 50 | 48 | 25.7 | | |
| Institute | | | | | 5.991 | .014 |
| DMC | 80 | 61.5 | 89 | 47.6 | | |
| SMC | 50 | 38.5 | 98 | 52.4 | | |
| Gender | | | | | .704 | .401 |
| Male | 36 | 27.7 | 44 | 23.5 | | |
| Female | 94 | 72.3 | 143 | 76.5 | | |
| Status | | | | | .144 | .930 |
| Below Middle class | 8 | 6.2 | 13 | 7 | | |
| Middle class | 101 | 77.7 | 146 | 78.1 | | |
| Upper class | 21 | 16.2 | 28 | 15 | | |
| Vaccinated | | | | | 10.458 | .001 |
| Yes | 123 | 94.6 | 7 | 5.4 | | |
| No | 154 | 82.4 | 33 | 17.6 | | |

Out of these 123(94.6 %) participants who were vaccinated for other diseases were also aware of the tetanus dilemma, whereas 154 (82.4%) who were although not vaccinated too had knowledge about tetanus.

DISCUSSIONS:

Minor injuries and wounds are common established predisposing factors for developing Tetanus that had been common among the study subjects. These findings suggest that a sizable component of population is at risk of developing this disease⁽⁸⁾. Even though their knowledge and awareness about this disease is well established however (23.5 % males and 76.5 % females %) did not know that this disease could cause death or serious consequences and this lack of awareness was largely responsible for their attitudes towards vaccination and post-exposure prophylaxis. Previous study suggest high incidence of deaths due to tetanus in our country⁽⁸⁾. Although the

incidence of tetanus is low in developed countries, the worldwide incidence of tetanus is 1 million cases per year and the mortality rate is between 20% and 45%⁽¹⁵⁾. Pakistan has one of the world's highest rates of tetanus, An estimated 2000-3000 human cases per year. According to the research conducted in Delhi in 2005 it was estimated that more than one-third of doctors were not aware of protective duration of immunity as 38.3% favored administration of TT after every injury⁽⁹⁾. This coupled with poor knowledge about exact duration when to give TT booster in case of injury, In contrary our research depicted that both the age groups; 17-20yrs and >20yrs had equal knowledge that is 50 % each regarding tetanus immunization. More over 61.5% students of DMC and 94.6% subjects vaccinated for other diseases as well had, sufficient knowledge of tetanus comparatively to the ones in SMC and those who had not been vaccinated at all. Tetanus prophylaxis in wound management is a major issue for EPs. According to tetanus prophylaxis wound management protocols, even patients with clean minor wounds should receive tetanus-diphtheria vaccinations if their last boosters were over 10 years prior⁽¹³⁾. Anti-tetanus immunization has proved to be one of the most successful preventive measures in medical practice. The tetanus-diphtheria vaccine is safe and has fewer side effects than the DTaP vaccine when given as a booster. Possible side effects include fever, fatigue, headache, and lymphadenopathy. However, these side effects subside spontaneously within 2 or 3 days⁽¹⁴⁾. Factors that contribute to adverse reactions are age of the subject, route and method of injection, tetanus antitoxin levels prior to vaccination, and the presence of adjuvant⁽¹²⁾. The accepted

protective titre of neutralizing antibody is 0.01 U/ml⁽¹⁰⁾. Although our research was limited to medical college students who had some degree of know how regarding tetanus, with our study were commend further research among the civilians on a more broader aspect, in order to evaluate the knowledge of grave complications of tetanus and like diseases. Tetanus has to be diagnosed clinically as there are no specific diagnostic laboratory tests and differential diagnosis of the characteristic features is limited⁽¹¹⁾. National recommendations should be followed at all times while administering the vaccine. If national recommendations for tetanus are implemented in clinical practice, then the impact on control of the disease should be monitored closely. An immunization card containing the details of tetanus immunization can be kept with the patient at all times. This will enable the health care personnel to know the immunization status of the patient when needed. In the absence of such a health card the use of rapid tests for tetanus immunity can be used for appropriate wound management in the emergency department. All the undergraduates, the upcoming doctors who had participated in the study had been acknowledged.

CONCLUSION:

As tetanus immunization is part of the immunization schedule for more than two decades, a higher level of knowledge is expected from the medical students which is the case observed in the present study however, there is some need to upgrade the level of knowledge and guideline adherence needs to be emphasized so that appropriate schedules are followed and right knowledge is passed onto general public. For this

immunization against tetanus should get due emphasis at various forums for increasing awareness among health care personnel. The key message that needs to be driven home is that tetanus vaccine, if previously received whether in the form of an antigen or combined vaccine, should be accounted for when deciding further injections in different types of injuries.

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