

Tetanus Prevention Knowledge and Practices in Doctors of a Tertiary Care Centre of India

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Abstract

Introduction: The most important risk factor for the development of tetanus is lack of immunization. In taking care of wounds suspected of tetanus and use of prophylaxis for it, a history of patient's vaccination is very important because in individuals who have received five initial vaccination doses completely no particular intervention is necessary, except for cases in which the wound is high risk for tetanus. **Aims of the study:** 1) to assess the knowledge of doctors about tetanus immunization in relation to injuries. 2) To assess the current tetanus prevention practices among doctors while treating adult patients with trauma. **Methodology:** The study is a prospective, cross-sectional, multi-centric, observational, questionnaire-based study. For the purpose of this thesis, a descriptive co relational analytical survey was used, in which a qualitative approach w be undertaken to determine the answers of the research questions. The sample size required for this survey was calculated as 322, rounded to 325. **Results:** In our study a total of 115 Emergency Physicians responded via the Web-based software. Though in many places the physicians had considerable knowledge still a significant number of physicians lacked knowledge in various domains when we compared their answers with the latest World Health Organization Guidelines. **Conclusion:** Better cognizance of tetanus prophylaxis recommendations is necessary and tetanus prophylaxis. National recommendations should be followed at all times while administering the vaccine.

Keywords: Tetanus; Prophylaxis; World Health Organization.

Introduction

Tetanus is a common life-threatening disease all around the world. The exact prevalence rate of the condition is not known world-wide but based on estimates the incidence is 500,000 to 1,000,000 cases annually with a mortality rate of 20 – 45%. Despite the fact that the condition is an international problem, Tetanus-related mortality in developing counties is 135 folds higher than developed countries. It should be pointed out that tetanus is the only non-communicable infectious disease which can be prevented by vaccination.

The most important risk factor for the development of tetanus is lack of immunization. In taking care of wounds suspected of tetanus and use of prophylaxis

for it, a history of patient's vaccination is very important because in individuals who have received five initial vaccination doses completely no particular intervention is necessary, except for cases in which the wound is high risk for tetanus.

Tetanus toxoid is one of the most commonly administered vaccines. The "Expanded Programme of Immunization" since 1978 developed guidelines on tetanus immunisation, and it is expected that all the doctors know the correct immunization schedule. In spite of these clear-cut guidelines regarding tetanus immunization, tetanus toxoid injection is often given after every injury without considering previous immunization status or referring to any standard guidelines. Although one of the reasons for this could be that the history is unreliable, but this may not be the sole reason for this practice. The other reason could

be that doctors and health care providers themselves are not aware of the correct immunization schedules in different groups or they simply don't realize importance of the previous immunization status. Several previous studies all over the world have shown that doctors had poor knowledge of tetanus immunization.

Aim of the Study

With this background our study has been planned with the following objectives

1. To assess the knowledge of doctors about tetanus immunization in relation to injuries.
2. To assess the current tetanus prevention practices among doctors while treating adult patients with trauma.

Study Methodology

This section deals with the research methods that will be used in this study to survey the knowledge, attitudes and practices of the doctors of emergency medicine in India, regarding tetanus prevention. The study will be conducted throughout India. The duration of the study was 1 year, from December 2014 to November 2015.

The study is a prospective, cross-sectional, multi-centric, observational, questionnaire-based study. For the purpose of this thesis, a descriptive correlational analytical survey was used, in which a qualitative approach will be undertaken to determine the answers of above mentioned research questions. According to Cormack (2000), this type of research approach allows a large collection of empirical evidence through a series of steps according to a pre-specified plan of action. Essentially, descriptive and correlation are classed as non-experimental research methods and in a survey; its purpose is to observe, describe, and document aspects of a situation as it naturally occurs and to describe the interrelationship variables (Polit *et al* 2001). After collection of the available data from the questionnaire, it was analysed in Peerless Hospital & B. K. Roy Research Centre, Kolkata, which is a multi-speciality hospital.

Inclusion Criteria

1. Emergency physicians who work regularly (at least 30 hours/week) in a structured Emergency

department in India or who are member of SEMI (Society of Emergency Medicine, India)

Exclusion Criteria

1. Doctors with less than 6 months of experience in medical field *i.e.* post-MBBS
2. Doctors who do not work regularly (less than 30 hours/week) in Emergency departments in India

Data Presentation and Results

In our study a total of 115 Emergency Physicians responded via the Web-based software Survey Monkey (<http://www.surveymonkey.com>). This may be considered a fairly good number as 'emergency medicine' in India is a relatively new branch and the number of physicians dedicated to this department is less when compared to other subjects. In this survey the maximum number of respondents were in between the age groups of 25–44 yrs. This also shows that most of the emergency physicians in India are young. Most of the other similar studies are done in residents such as the one by Hojjat Derakhshanfar et. al have an average age of 33.3yrs. In our survey the median age was 31.03 years, mode 31.76 years; for physicians having experience less than equal or to 10 years median age 29.90 years and mode 30.21 years; for physicians having experience more than 10 years median age 41.81 years and mode 43.75 years. In the study it was seen that most of the respondents (82.61%) were males, which is unlike Derakhshanfar H et. al study who have a higher number of females. Though this may not be related but it may be a fact that still Emergency Medicine is in its infancy stages in India, so there are lesser number of females. In the absence of adequate number of emergency medicine MD seats in India most of the respondents were either having MEM or MCEM degree/ diploma or were post graduate trainees. It was also noted that almost all (90.43%) of the Emergency Physicians who responded to this study were working in the private set up which shows that the concept of emergency medicine is still not developed in our Government set up. Though there has been some recent attempts to improve this condition. In our questionnaire all the wounds mentioned are Tetanus prone wounds, as per guidelines of WHO and Up To Date.

It was seen that most of the respondents considered burns (89.57%), wound requiring debridement's (86.09%), wounds older than 6 hours(85.22%), puncture type wounds(88.70%), deep wounds

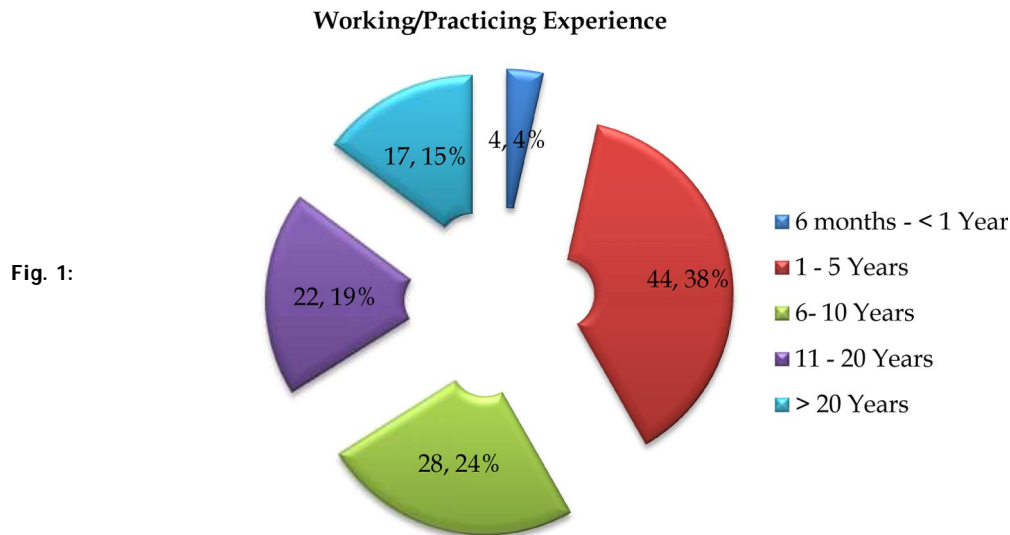


Fig. 1:

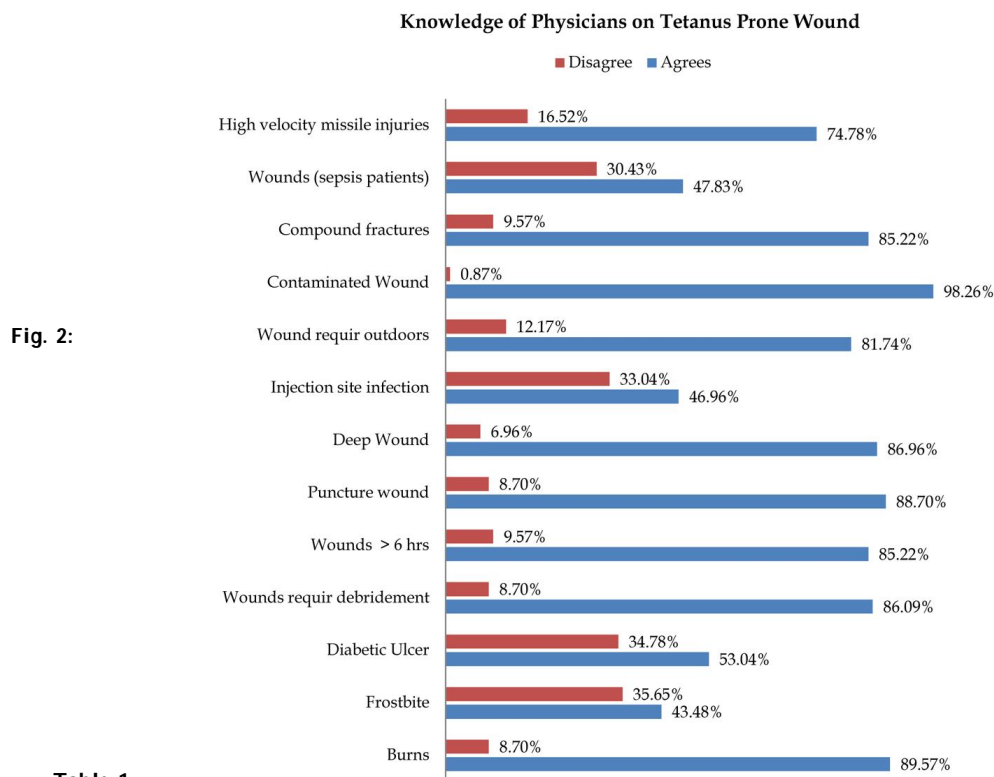


Fig. 2:

Table 1:

Category of Wounds	Agree (No.)	Disagree (No.)	No answer (No.)
Burns	103 (89.57%)	10 (8.70%)	2 (1.74%)
Frostbite	50 (43.48%)	41 (35.65%)	24 (20.87%)
Diabetic Ulcer	61 (53.04%)	40 (34.78%)	14 (12.17%)
Wounds requiring debridement	99 (86.09%)	10 (8.70%)	6 (5.22%)
Wounds older than 6 hours	98 (85.22%)	11 (9.57%)	6 (5.22%)
Puncture type Wound	102 (88.70%)	10 (8.70%)	3 (2.61%)
Deep Wound	100 (86.96%)	8 (6.96%)	7 (6.09%)
Infection at injection site in drug addicts	54 (46.96%)	38 (33.04%)	23 (20.00%)
Wound received outdoors	94 (81.74%)	14 (12.17%)	7 (6.09%)
Contaminated Wound	113 (98.26%)	1 (0.87%)	1 (0.87%)
Compound fractures	98 (85.22%)	11 (9.57%)	6 (5.22%)
Wounds in sepsis patients	55 (47.83%)	35 (30.43%)	25 (21.74%)
High velocity missile injuries	86 (74.78%)	19 (16.52%)	10 (8.70%)

(86.96%), wound received outdoors (81.74%), contaminated wound (98.26%) and high velocity missile injuries (74.78%). But on the other hand it was a bit of concern to see that a large percentage of people did not consider diabetic ulcers (46.96%), infection at injection site in drug addicts (53.04%) and wounds in sepsis patient (52.17%) as tetanus prone wounds.

Thus it is very necessary to improve the knowledge of emergency physicians regarding the fact that all wounds other than clean wounds should be considered 'tetanus prone'. Respondents were questioned on the recommendations for tetanus immunization for tetanus prone wounds. In these wounds guidelines state that if the patient had taken complete immunisation within last 5 years there is nothing required while 13 (11.50%) prescribe tetanus vaccination always, 71 (62.83%) prescribe never, while negligible no. 1 (0.88%) prescribe full schedule dose always. This shows that there are some who do not immunize according to the guidelines. In case of complete immunisation done within 5-10 years where just one TT dose is recommended 36 (31.58%) prescribe tetanus vaccination always in presence of tetanus prone wounds while 18 (15.79%) never prescribe. In another sub group of patient where primary immunisation is complete 20 (18.87%) prescribe tetanus vaccination always in presence of tetanus prone wounds, considered by them, to the patients, 44 (41.51%) prescribe never, while negligible no. 1 (0.94%) prescribe full schedule dose always. Out of 109 respondents 18 (16.51%) prescribe tetanus vaccination always in presence of tetanus prone wounds, considered by them, to the patients who have completed primary immunization along with one booster dose, 44 (40.37%) prescribe never. So this shows that though TT is not required in these patients 16.51% people still give TT. It is also noteworthy that quite a large number did not respond which points to lack of knowledge or confusion. It should be clear that giving tetanus toxoid after every injury or before the recommended timing of booster dose is unjustified and may result in adverse reactions, in the form of Arthus type hypersensitivity reactions.^{1,2} In patients with unknown status the situation was better where majority of the physicians were correct in line with the guidelines to give a TT. Out of 112 respondents 66 (58.93%) prescribe tetanus vaccination always in presence of tetanus prone wounds, considered by them, to the patients with unknown vaccination status, 4 (3.57%) prescribe never, 43 (38.39%) gave full dose schedule at times, while 8 (7.14%) prescribe full schedule dose always. In Immunocompromised patients out of 107 respondents 56 (52.34%) prescribe tetanus vaccination always in presence of tetanus

prone wounds, considered by them, to Immunocompromised patients, 17 (15.89%) prescribe never, while 6 (5.61%) prescribe full schedule dose always. In Immunocompromised individuals such as HIV-infected adults the response to a booster dose induces protective levels; 24R however the response tends to be lower than in uninfected controls.^{25, 26, 27} R. It was seen that more than 20% people never considered giving TT to Immunocompromised persons. The knowledge of emergency physicians regarding giving TIG to tetanus prone patients was also not upto the mark. The guidelines suggest that "persons who have no documented history of a primary vaccination course (3 doses) with a tetanus toxoid-containing vaccine should receive all missing doses and must receive TIG". Out of 113 respondents 17 (15.04%) prescribe TIG always in presence of tetanus prone wounds, even to the patients who have completed full course of vaccination in less than 5 years ago, but the majority 84 (74.34%) never prescribed it. Almost the same number of patients considered giving TIG to patients who were immunized between 5- 10 yrs or even more than 10 yrs ago. But it was encouraging to see that majority of the physicians were correct. It was also very interesting to see that proportion of physicians having ≤ 10 years experience prescribing TIG always to all patients other than immune compromised do not differ significantly with the proportion of physicians with > 10 years experience (P value > 0.05). Another lacunae in the knowledge seen in 36.45% of physicians was that they did not consider giving TIG to immune compromised patients. Patients who are immune compromised may not be adequately protected against tetanus despite having been fully immunised. Thus they should be managed as if incompletely immunised. In the section of awareness questionnaire about tetanus vaccine and immunisation: Out of 115 Physicians 70 (60.87%) agree with TT should be given as early as possible, while a fair number 42 (36.52%) don't. It is recommended that if indicated TT should be given as early as possible. It was very surprising to see that 67.83% of emergency physicians did not know the schedule and number of doses of TT. The TT vaccine schedule consists of a childhood immunization schedule of five doses is recommended, with a booster dose of a tetanus toxoid containing vaccine ideally at age 4-7 years and another booster in adolescence, e.g. at age 12-15 years. (WHO 2017). On the other had there was a ray of hope in seeing that the knowledge of majority of the respondents regarding TT in pregnant women was good where 106 (92.17%) agree with the requirement of 2 doses of TT at 4 weeks of interval for pregnant woman with no h/o TT, while 5 (4.35%) don't; 42

(36.52%) agree with no requirement of TT during pregnancy within last 3 years for woman with h/o TT. Tetanus vaccines should be refrigerated between 2°C and 8°C (36°F and 46°F). Do not freeze vaccine, or expose to freezing temperatures. Most 96 (83.48%) agree with this ideal mode of storage of the tetanus vaccine. As is apparent from the study, the awareness of immunization against tetanus was poor among emergency physicians of India. Indication of TT injection by a substantial percentage of subjects was unnecessary as the need for vaccination depends upon the previous immunization status of the individual, including the number of doses of TT received, duration since last dose and the type of

injury. The knowledge of tetanus immunization schedule for pregnant female was good among the emergency physicians. It was also seen that experience of more than 10 years or less than it did not have a statistically significant difference in the knowledge of the emergency physicians regarding tetanus prophylaxis. Better cognizance of tetanus prophylaxis recommendations is necessary and tetanus prophylaxis recommendations 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. National recommendations should be followed at all times while administering the vaccine.

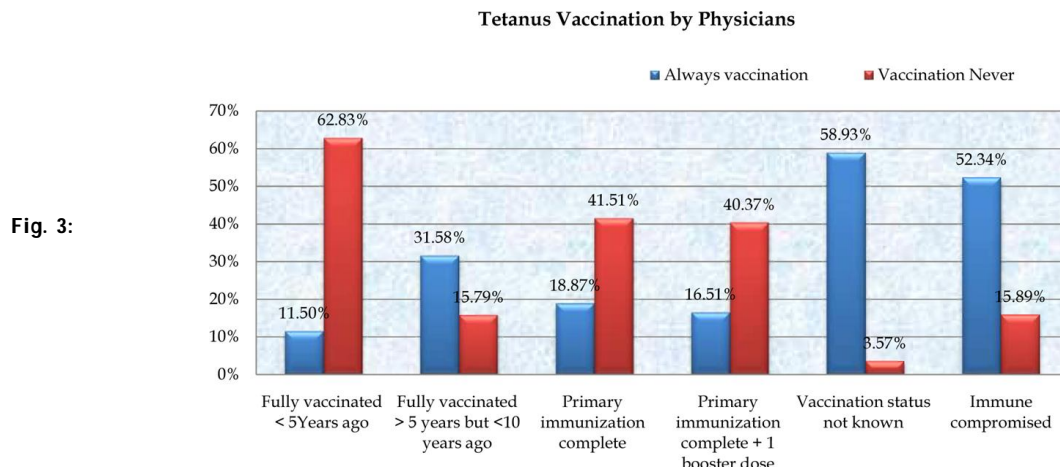


Fig. 3:

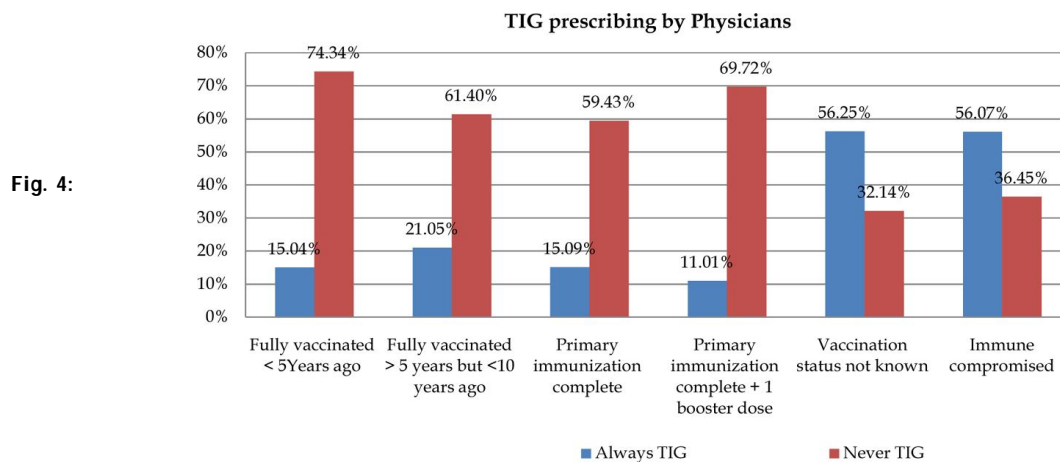


Fig. 4:

Table 2:

Past Vaccination Scenario	Always	Never	Full schedule dose	Full schedule dose (always)
Fully vaccinated < 5 Years ago (n = 113)	13 (11.50%)	71 (62.83%)	1 (0.88%)	1 (0.88%)
Fully vaccinated > 5 years but < 10 years ago (n = 114)	36 (31.58%)	18 (15.79%)	13 (11.40%)	0 (0.00%)
Primary immunization complete (n = 106)	20 (18.87%)	44 (41.51%)	8 (7.55%)	1 (0.94%)
Primary immunization complete + 1 booster dose (n = 109)	18 (16.51%)	44 (40.37%)	2 (7.55%)	0 (0.00%)
Vaccination status not known (n = 112)	66 (58.93%)	4 (3.57%)	43 (38.39%)	8 (7.14%)
Immune-compromised (n = 107)	56 (52.34%)	17 (15.89%)	31 (28.97%)	6 (5.61%)

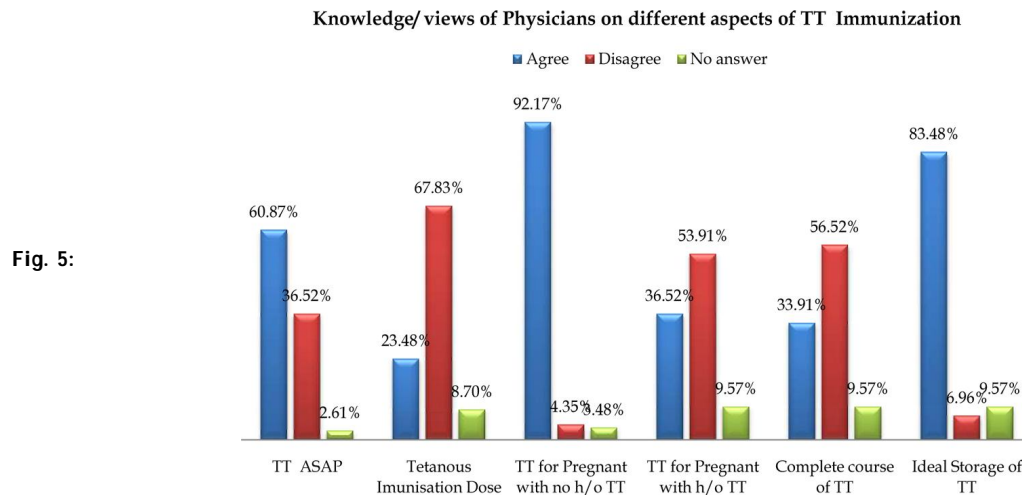


Fig. 5:

Discussion

It was mainly a male predominant population about 86%, mostly in the age group of 25 to 34 years. The maximum number of respondents in our series are Post Graduate residents 52 (45.22%) closely followed by consultants. The population had a large number of people belonging to the department of Emergency Medicine. We had a good response from all over the country and even two from abroad. The maximum number of people were from West Bengal 42 (36.52%). 104 (90.43%) of the respondents worked in private sectors. Only 10 (8.70%) persons were from government sectors. Leaving aside eight respondents all were practicing full time. The survey showed we had people with varied experiences ranging from six months to more than twenty years. The maximum number of respondents 44 (38.26%) were seen to have an experience between 1-5 years.

In presence of tetanus prone wound considered by the respective physicians, proportion of physicians having < 10 years experience prescribing tetanus vaccination always to patients with any past vaccination scenario do not vary significantly with the proportion of physicians with > 10 years experience (P value > 0).

Conclusion

The knowledge of tetanus immunization schedule for pregnant female was good among the emergency physicians. It was also seen that experience of more than 10 years or less than it did not have a statistically significant difference in the knowledge of the emergency physicians regarding tetanus prophylaxis.

Better cognizance of tetanus prophylaxis recommendations is necessary and tetanus prophylaxis recommendations 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. National recommendations should be followed at all times while administering the vaccine.

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