

# **Tetanus Immunization**

## **Knowledge Amongst Healthcare Workers of the Emergency Department at a Tertiary Care Hospital**

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### **ABSTRACT**

**Background:** A high prevalence rate of neonatal and adult tetanus in Pakistan reflects the failure of health care systems to provide adequate immunization. Health care workers (HCWs) of emergency departments (ED) are generally at the frontline to deal with patients of road traffic accidents, trauma and burns. However, it has been observed that these patients receive incomplete preventive measures to combat tetanus.

**Objective:** To assess the knowledge of tetanus immunization among healthcare workers (HCW) of the emergency department (ED) at a tertiary care hospital.

**Methods:** A cross sectional study was conducted on 104 HCWs of ED of Ziauddin University. A structured questionnaire was filled by HCWs during April and May 2014. Data were analyzed on SPSS 20.0. Categorical variables were presented as frequency and percentage, while continuous variables were presented as mean. P value of <0.05 was considered significant.

**Results:** Total 104 HCWs from ED participated in the study. Only 11.8% (12) HCWs were aware of the correct dosing schedule in children under 12 years of age. 56.3% (58) and 68% (70) were aware of correct schedule in adult population and in pregnant females, respectively. Knowledge of tetanus immunization in different types of wounds according to previous immunization status of patients was also found inadequate.

**Conclusion:** HCWs of ED have inadequate knowledge about tetanus prone injuries and its immunization, which needs to be addressed.

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## INTRODUCTION

Tetanus is preventable through the administration of tetanus toxoid (TT) which is available in different forms i.e. DPT, DT, TT, ATS.<sup>1,2</sup> It has been reported that in the developed world there has been 96% reduction in the prevalence of tetanus cases and elimination of neonatal tetanus since late 1940's. The reduction of the tetanus in the developed world is attributed to effective vaccination programs, improved wound care and hygienic birth practices.<sup>3</sup> In the USA, all emergency departments provide pre-exposure tetanus immunization to non-immunized along with post-exposure immunization and booster to previously immunized individuals.<sup>4</sup>

In the developing world, however, like Pakistan, tetanus, both in adults and neonates has high prevalence rate that reflects failure of the health care delivery system to provide immunization, which remains the best and economical method of preventing this potentially fatal disease.<sup>5</sup>

Health care personnel of ED are the frontline workers to deal with wound, burns and road traffic accident but it is observed that these patients only receive one dose of TT and the complete schedule of the dose is not followed resulting in incomplete vaccinations. The major reasons are either lack of record keeping at the hospitals end, and/or the lack of knowledge amongst Health care workers of ED, hence this study has been conducted to assess the knowledge of tetanus immunization in emergency department personnel.

## METHODOLOGY

It was a descriptive cross-sectional study. Sample size was 104 which includes all HCWs of ED from three campuses of Ziauddin University, selected by simple random sampling. They were comprised of 44 doctors (including

casualty medical officers, post-graduate students, and casualty supervisors) and 60 nurses. Undergraduate students, rotating in the ED, were excluded from the study. Moreover, in order for the study to be conducted an ethical clearance was obtained from the ethical review committee of the university (ref no 0971113UGMED).

A structured, self-administered questionnaire was distributed amongst the HCWs between April and May 2014. A verbal informed consent was taken from the participants. The questionnaire comprised of the demographic data of the participant, knowledge of immunization in children, adults and pregnant females, type of injury that is tetanus prone and knowledge of tetanus immunization schedule - according to the immunization status of the individual. Correct answer was given one point and afterwards the entire data were entered and analyzed on SPSS version 20.0.

Descriptive analysis was used for demographic data and the mean and the standard deviation were used for quantitative data. Furthermore, the relation between the knowledge and other variables were tested by using P-value. On categorical variables chi square test was applied. P-value of < 0.05 was considered significant.

## RESULTS

Total 104 health care workers (HCW) participated in the study including 56.7% (59) males and 43.3% (45) females. The mean age of the participants was 27.7±5.6 years. Amongst these HCWs from the ED, 57.7% (60) were nurses of various grades and 43.3% (44) were doctors. 56.3% (58) of the HCW have work experience of less than two years.

Table 1 shows correct responses rate of the doctors and the nurses for TT immunization in relation to different types of injuries.

Tetnus immunization knowledge amongst healthcare workers of emergency department of a tertiary care hospital

**Table 1. Correct responses rate of the participating doctors and nurses for TT immunization in relation to different types of injuries.**

Type of Injury	Nurses % (N)	Doctors % (N)	P Value
Any cut injury	16.9 % (10)	52.3 % (23)	0.00
Contaminated Wounds	79 % (45)	93 % (41)	0.003
Human bite	71 % (42)	70.5 % (31)	0.506
Animal bite	94.9 % (56)	95.5 % (42)	1.00 (>0.05)
Burns	67.8 (40)	77.3% (34)	0.377 (>0.05)

67.3% (70) of HCWs at ED believed that patient with "any wound" should receive TT immunization. Only 16.9% (10) of the nurses gave correct answer in contrast to 52% (23) of what doctors believed (p value 0.00). Whereas 79% (45) of nurses in contrast to 93% (41) of doctors believed all contaminated wounds should be immunized. Furthermore, similar proportion of doctors and nurses were in favor of giving TT immunization to the victims of burns, animal and human bite.

Table 2 shows the correct response of HCWs regarding the number of doses of TT immunization in different age groups and in pregnant females.

**Table 2. Knowledge of number of doses of TT immunization in different age groups and in pregnant females**

Age Group	Nurses % (N)	Doctors % (N)	P Value
In children < 12 years of age	6.9 % (4)	18.2 % (8)	0.12 (>0.05)
In adults >12 years	66.1 % (39)	43.2 % (19)	0.02
In pregnant females with no previous history of	76.3 % (45)	56.8 % (25)	0.54

immunization

In pregnant females with previous history of immunization in last 3 years	11.9 % (7)	50 % (22)	0.00
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Both nurses and doctors had inadequate knowledge of immunization schedule for children of less than 12 years age since only 11.8% (12) of HCWs were aware of the correct dosing schedule. Whereas 66% (39) of nurse as compared to 43% (19) of doctors (p value 0.02) were aware of the correct dosing schedule of adult population.

Overall 68% (70) of HCWs were aware of the correct schedule of TT vaccination in pregnant females with no previous history of tetanus immunization but only 28.2 % (29) gave correct answer regarding dosing schedule in pregnant females with prior history of immunization in last 3 years.

Table 3 shows the knowledge of HCW for the tetanus immunization in any type of cuts based on the immunization history of patients.

**Table 3. Knowledge of tetanus immunization in clean wounds, according to immunization history of the patient**

Immunization history for any cut	Nurses % (N)	Doctors % (N)	P Value
< 5 years	32% (19)	52% (23)	0.04
5-10 years	62.7% (37)	43.2% (19)	0.072
>10 years	47.5% (28)	29% (13)	0.072
No history of immunization	35% (21)	40% (18)	0.68

The results show that 52% (23) of the doctors and 32% (19) of the nurses believe that patients with clean wounds and having a complete history of immunization within the last 5 years do not require any vaccination at the time of injury. While patients with complete immunization

within 5 to 10 years, 62.7% (37) of the nurses and 43% (19) of the doctors believe TT1 is recommended. Although immunization more than 10 years ago requires TT1, 70% (31) of the doctors and 52% (32) of the nurses did not recommend it during the survey.

Table 4 shows the knowledge of the doctors and the nurses for a tetanus immunization in the case where a wound is contaminated.

**Table 4. Knowledge of tetanus immunization in contaminated wound, according to immunization history of the patient**

Immunization in Contaminated Wound	Nurses % (N)	Doctors % (N)	P Value
< 5 years	18.6% (11)	40.9% (18)	0.016
5-10 years	67.8% (40)	45.5% (26)	0.02
>10 years	11.9% (7)	27.3% (12)	
No History of Immunization	24% (14)	41.9% (18)	0.08

In case of a wound which is considered tetanus prone, in a patient with immunization history within last 5 years nothing is required, however, 82% (49) of the nurses and 60% (26) of the doctors gave incorrect answer. Whereas in a similar category of wound with an immunization history from 5-10 years, 67.8% (40) of the nurses and 45.5% (26) of the doctors gave correct answer that is TT1 is required. Although TT1 with HTIG is recommended in the case of immunization history of more than 10 years, 82% (52) nurses and 73% (31) doctors gave wrong answer. Furthermore, for a tetanus prone injury with no prior history of immunization, complete TT along with HTIG is recommended but 76% (43) nurses and 58% (25) doctors gave incorrect answer.

## DISCUSSION

This study reveals that HCWs of the emergency department have inadequate knowledge of is required.<sup>14</sup> Immediate protection through passive immunization by tetanus

tetanus immunization. Majority of the participants (72% doctors and 97% of nursing staff) have had incorrect knowledge of tetanus vaccination in children under 12 years of age. Regarding the knowledge of vaccination, in pregnant females, with no prior history of immunization in the last three years, their overall knowledge is better as 68% of the HCW gave correct information.

When the survey's finding is compared with doctors in other areas of Karachi and around the world then it was observed that 56% of the participants have had correct knowledge of adult tetanus immunization as compared to 37% of general practitioners from Karachi,<sup>6</sup> and 93% of doctors from Trinity Hospital USA.<sup>7</sup>

In this survey, 67% of the participants wrongly considered any wound to be tetanus prone whereas in comparison 22% of the participants from Princess Royal University gave similar response.<sup>8</sup> Similarly in a survey on internee doctors from Kolkata, India, 27% seemed to be overcautious in their use of tetanus vaccination for cut injuries and considered any wound to be tetanus prone.<sup>9</sup>

According to the recommendations, patients of burn injuries require tetanus vaccination and those burn victims who never had tetanus immunization in the past, require tetanus immunoglobulins.<sup>10,11</sup> however in this study 29% of the participants believed that burn patients do not need tetanus immunization, whereas in another study from New Dehli, India, 92% of the nurses and 87.5% of the doctors recommended TT in patients of burn injuries.<sup>12</sup>

Regarding the recommendations for TT and HTIG majority of the participants in this study answered incorrectly and recommended their use where they are not recommended. TT and HTIG although both are considered relatively safe, there have been reports of hypersensitivity reaction following their use.<sup>13</sup> Therefore, an unnecessary use of TT and tetanus immunoglobulins should be avoided.

According to the recommendation in a patient with contaminated wound who had no prior history of immunization or had last vaccine ten years back, then human tetanus immunoglobulins HTIG along with tetanus toxoid immunoglobulin is very important in the prevention of tetanus in heavily contaminated

## Tetanus immunization knowledge amongst healthcare workers of emergency department of a tertiary care hospital

wounds. Tetanus immunoglobulins are given to protect against the circulating toxins since tetanus toxoid increases the antibody titers to protective level within 7 days, leaving the patient vulnerable to tetanus.<sup>15</sup> Hence, immunoglobulins are recommended to provide immediate protection that lasts for 3 weeks.<sup>16</sup> However HCWs in this study have inadequate knowledge in this category as well.

A better awareness of tetanus vaccination schedule is required in HCWs of ED to prevent this potentially fatal disease. Seminars, group discussions and training sessions should be arranged for the HCW to update their knowledge and practice. In addition to that a display of immunization protocol in the ED should be emphasized. Besides that, a hospital management should be advised to maintain a patient's immunization record.

In this study, although, the actual practices were not assessed, yet it revealed information

regarding their knowledge that needs to be addressed.

### CONCLUSION

Immunization for tetanus prone injuries in the ED is the key to preventing tetanus, therefore, better knowledge is expected from the HCWs of ED but this has not been observed in this study. Furthermore, misconceptions about the unnecessary use of HTIG and repeated TT injections need to be addressed. Hence it is needed to upgrade the knowledge of HCWs through CME, seminars and workshops. Besides that, HCWs should encourage public to complete tetanus immunization schedule and keep the record of it.

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### REFERENCES

- <sup>1</sup> DM Skowronski, K Pielak, VP Remple. Adult tetanus, Diphtheria and Pertussis immunization: knowledge, beliefs, behavior and anticipated uptake. *Vaccine* 2004; 23: 353-361
- <sup>2</sup> Galazka A, Gasse F. The present state of tetanus and tetanus vaccination. *Curr Top Microbiol Immunol* 1995; 195: 31-53.
- <sup>3</sup> Pascal FB, McGinley EL, Zanardi LR. Tetanus surveillance-United States, 1998-2000. *MMWR Surveill Summ* 2003; 52(3): 1-8
- <sup>4</sup> Roper MH. Tetanus Prophylaxis in the Emergency Department *Ann Emer Med*. 2004; 43(3): 315-317.
- <sup>5</sup> Deepthi A, Nalini R. New trends in the management of tetanus. *Expert Rev. Anti-infect*. 2004; 2(1): 73-84.
- <sup>6</sup> Ahmed SI, Siddiqui SI, Jafari A. Knowledge, Attitude and Practices of general practitioners in Karachi District Central about Tetanus Immunization in Adults. *J Pak Med Assoc* 2001; 51(10): 367-369
- <sup>7</sup> Douglas KC, Odeil M, Monroe A. Adult immunization in network of family practice residency program at Trinity Lutheran Hospital, Kansas city farm. *Pract* 1990; 31: 513-520
- <sup>8</sup> Savage EJ, Nash S, McGuinness A. Audit of tetanus prevention knowledge and practices in accident and emergency departments in England *Emer Med J* 2007; 24: 417-421
- <sup>9</sup> Chowdhury R, Mukherjee, SK Lahiri. A study on the knowledge of tetanus immunization among internees in a government medical college of Kolkata. *National J Comm Med* 2011; 2(3): 432-439.
- <sup>10</sup> Karyoute SM, Badran IZ. Tetanus following a burn injury. *Burn Incl Therm Inj* 1988; 14: 241.
- <sup>11</sup> Musajo SA, Zacchino M. Tetanus prevention in burn patients. *Arch (Torino)* 1977; 134(4): 475-479
- <sup>12</sup> Dabas P, Agarwal CM, Kumar R. Knowledge of general public and health professionals about tetanus immunization. *Indian J Pediatr* 2005; 72(12): 1035-1038.
- <sup>13</sup> Immunization practice advisory committee CDC Atlanta. Diphtheria, tetanus and pertussis: Recommendations and other preventive measures. *MMWR* 1991; 1-28
- <sup>14</sup> Smith JW, Laurence DR, Evans DG. Prevention of tetanus in the wounded. *BMJ*. 1975; 3: 453-455.
- <sup>15</sup> Rhee P, Nunley MK, Dermetriades D. Tetanus and Truma: A review and recommendations. *J Trauma* 2005; 58(5): 1082-1088.
- <sup>16</sup> Talan DA, Abrahamian FM, Moran GJ. Tetanus immunity and physician compliance with tetanus prophylaxis practices among emergency department patients presenting with wounds. *Ann Emer Med* 2004; 43(3): 305-314.