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Research Article

**ANALYSIS OF RISK FACTORS, VACCINATION STATUS  
AND OUTCOME OF TETANUS IN CHILDREN**Dr Hina Fatimah<sup>1</sup>, Dr Kashaf Imran<sup>1</sup>, Dr Asifa kanwal<sup>1</sup><sup>1</sup>Health department Punjab.

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**Abstract:**

**Introduction:** Vaccination is the most effective and economical means of combating the disease. Considerable progress has been made in increasing immunization coverage of children around the world through Expanded Immunization Program (EPI) of World Health Organization (WHO).

**Aims and objectives:** The main objective of the study is to analyse the risk factors, vaccination status and outcome of tetanus in children.

**Material and methods:** This cross-sectional study was conducted in Punjab health department during September 2018 to February 2019. The data was collected from 100 children of age 1 to 15 years. The data was collected through a questionnaire. Sociodemographic characteristics (gender, age, number of siblings, position among mother's children, ethnicity, and parents' educational level and occupation) and history TT injection 1 year before the study were also collected.

**Results:** The data was collected from 100 patients. Mean age of participants was  $3.7 \pm 2.3$  years and children 5 years and below constituted 79.3%. There was no significant difference between male and female patients' distribution by age. History of vaccination was confirmed by examining the vaccination card and history. Uptake rate for DPT-3 was 19.1% as indicated by vaccination card and 29.9% as indicated by history. Combining evidence from vaccination card and history suggested a total DPT-3 uptake rate of 49.0%.

**Conclusion:** It is concluded that Vaccination coverage was found to be inadequate and post-trauma tetanus immune prophylaxis had been ignored. Primary immunization with booster doses is stressed. Children with ear discharge should be taken as high-risk group and must be evaluated for tetanus immunisation.

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## INTRODUCTION:

Vaccination is the most effective and economical means of combating the disease. Considerable progress has been made in increasing immunization coverage of children around the world through Expanded Immunization Program (EPI) of World Health Organization (WHO). Before the implantation of universal EPI by WHO in 1974, <5% of children were vaccinated against the vaccine-preventable diseases worldwide. Until 2013, global coverage with the four core vaccines especially diphtheria-tetanus-pertussis (DTP), polio and measles has reached more than 84% [1]. Therefore, a considerable success in eradication or noticeable reduction in the incidence and mortality of childhood diseases occurred.

Tetanus is an acute neurological but vaccine-preventable disease caused by *Clostridium tetani* that causes significant morbidity and mortality among children in developing countries. A recent systematic analysis of data from 2000 to 2010 showed that neonatal tetanus decreased in Africa at an annual rate sufficient to attain the Millenium Development Goal 4 and it accounted for 20,000–276,000 neonatal deaths (1% of all child mortality) in 2010 [2]. On the other hand, post-neonatal tetanus accounted for less than 1% of global child mortality. In Nigeria, of the five million babies born annually, 240,000 (4.8%) die within the first 4 weeks of life and tetanus accounts for up to 20% of these deaths [3].

Total eradication of tetanus is not likely because tetanus spores are found everywhere in the soil and stool of animals, but vaccination against the diseases can effectively protect susceptible individuals. The World Health Organisation (WHO) recommends administration of three doses of tetanus toxoid (TT) as one of the vaccines for routine immunization program to all infants and booster doses during adolescence and pregnancy in order to achieve elimination of tetanus in early childhood [4]. Many of the countries in sub-Saharan African are implementing this recommendation and they have either attained the elimination of tetanus or making substantial progress toward achieving this goal but some are not. Nigeria is one of the 27 countries

currently accounting for 90% of the global burden of the disease [5].

## AIMS AND OBJECTIVES:

The main objective of the study is to analyse the risk factors, vaccination status and outcome of tetanus in children.

## MATERIAL AND METHODS:

This cross sectional study was conducted in Punjab health department during September 2018 to February 2019. The data was collected from 100 children of age 1 to 15 years. The data was collected through a questionnaire. Sociodemographic characteristics (gender, age, number of siblings, position among mother's children, ethnicity, and parents' educational level and occupation) and history TT injection 1 year before the study were also collected. Caregivers were questioned about past medical history (medical and surgical antecedents), date of last trauma with or without a wound, date of childbirth, and consultation with a general practitioner to corroborate claims of tetanus vaccinations. A 3 ml blood sample was collected from each participant into a plain specimen bottle and serum was obtained and kept in kept at  $-20^{\circ}\text{C}$  until laboratory analysis.

## STATISTICAL ANALYSIS:

The data was collected and analysed using SPSS version 19.0. All the values were explain in mean and standard deviation.

## RESULTS:

The data was collected from 100 patients. Mean age of participants was  $3.7 \pm 2.3$  years and children 5 years and below constituted 79.3%. There was no significant difference between male and female patients' distribution by age. History of vaccination was confirmed by examining the vaccination card and history. Uptake rate for DPT-3 was 19.1% as indicated by vaccination card and 29.9% as indicated by history. Combining evidence from vaccination card and history suggested a total DPT-3 uptake rate of 49.0%. Only 25 (8.2%) participants had received at least a booster dose of TT injection after routine DPT vaccinations in infancy.

**Table 01:** Tetanus-related vaccination status by gender and birth position of study patients.

Tetanus antigen	Gender					Birth position				
	Male		Female		<i>p</i>	First born		Not first born		<i>p</i>
	<i>n</i>	%	<i>n</i>	%		<i>n</i>	%	<i>n</i>	%	
DPT-1	148	87.1	121	90.3	0.189	124	88.6	145	88.4	0.483
DPT-2	110	64.7	83	61.9	0.309	91	65.0	102	62.2	0.306
DPT-3	81	47.6	68	50.7	0.296	69	49.3	80	48.8	0.465

**DISCUSSION:**

Studies on tetanus in Pakistan have focussed mainly on neonatal and adult tetanus and data on post-neonatal tetanus is scarcely reported. Present study is an effort to highlight disease burden in post-neonatal age group. According to results, 6-10 years was the commonest age of presentation. This finding is consistent with other studies

Done in Pakistan and other developing countries [6].

This can be explained by the fact that EPI provides tetanus immunisation only in infancy without booster doses which provide protection till 3-4 years of life, protective level of antibodies then fall making individuals susceptible to tetanus. Our study showed male preponderance as shown by other studies, including neonatal, post-neonatal and adult tetanus [7]. This may be due to parental preference for males to bring for medical care or adventurous behaviour of males causing injuries and subsequent tetanus infection in unvaccinated children. Tetanus is still a major public health issue in Pakistan despite the availability of an effective vaccine. In this study, unvaccinated children outnumbered partially vaccinated (1-2 doses) and completely vaccinated (3 doses) children. Predominance of unvaccinated children reflects poor immunization coverage. These results are comparable to other studies [8].

According to a cohort study done in Karachi, very low proportion of children (39%) completed DPT3, and low adherence to immunisation has been found associated with parental socio-demographic characteristics (large family size, low parental education) and provider based characteristics. Getting tetanus despite complete vaccination is worth mentioning. In our study all completely vaccinated children were above 6 years of age and none of them had received booster which is expected at 15-18 months and 4-6 years age [9]. It has been shown in literature that 3 doses of DPT administered in infancy give protection up to 3-4 years of age, antibodies level then wane with time. So, it is suggested that booster doses must be included in EPI to prevent tetanus. Our study showed trauma as the most common risk factor and none of these patients got post-trauma tetanus immune prophylaxis. This is in agreement with other studies. Public must be made aware of good wound care and physicians must be made aware of identification of tetanus-prone wounds and their appropriate prophylaxis. According to a study done in Karachi, majority of general practitioners had poor knowledge, so interventions like seminars and display of immunisation protocols in clinics were recommended [10].

**CONCLUSION:**

It is concluded that Vaccination coverage was found to be inadequate and post-trauma tetanus immune prophylaxis had been ignored. Primary immunization with booster doses is stressed. Children with ear discharge should be taken as high-risk group and must be evaluated for tetanus immunisation.

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