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A CROSS SECTIONAL STUDY ON RISK FACTORS, VACCINATION STATUS AND OUTCOME OF TETANUS IN PAKISTAN

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Abstract:
Objectives of the study: The basic purpose of the study is to analyse the study on risk factors, vaccination status and outcome of tetanus in Pakistan.
Methodology of the study: This cross sectional study was conducted in Combined Military Hospital, Multan during December 2018 to May 2019. The data was collected from 200 children of both genders. The diagnosis of tetanus was clinical, based on medical history and examination, determining the presence of at least three of the following clinical findings: severe trismus, refusal to feed, generalised muscle rigidity, opisthotonus or spontaneous tetanic spasms. Blood samples were taken within one hour of admission. Laboratory measurements included full blood count, electrolytes, creatinine and glucose.
Results: The data was collected from 100 patients. There were 67(63.5%) males and 33 (36.5%) females. Overall, the mean age was 6.56+3.15 years, and the commonest age group at presentation was 6-10 years with 38(51.4%) cases. 50(67%) were unvaccinated, none (0%) had received booster dose and post-trauma immune prophyl axis. The case fatality was therefore 61.8%, and did not vary significantly over the 14 years (P = 0.536).
Conclusion: It is concluded that this study has documented high case fatality rates in Pediatric tetanus in the study area.

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INTRODUCTION:

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 [1]. 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 [2].

Neonatal tetanus (NT) continues to be a major cause of mortality and neurological sequelae for survivors yet it is highly preventable using simple and inexpensive public health interventions. In 2013, NT was estimated to be responsible for 49,000 deaths, mostly in rural areas of developing countries where most births occur at home and are often attended by unskilled persons using unhygienic practices without aseptic postnatal care [3]. NT is estimated to contribute about 2% of neonatal deaths in 2012, a decrease from 7% in 2000, but has a very high case fatality rate.

Tetanus is a neuromuscular disorder characterized by increased muscle tone and spasms. It is caused by tetano-spasmin, a toxin released by clostridium tetani [4]. Clostridium tetani, is a mobile gram-positive spore forming obligate anaerobe with soil or dust as its natural habitat. It occurs worldwide but is endemic in developing countries and has continued to be a significant public health problem in resource-poor nations [5]. Tetanus is a vaccine preventable disease and a significant cause of morbidity and mortality in developing countries. The disease is usually classified into neonatal and post neonatal tetanus in the pediatric age group [6].

Aims and objectives:
The basic purpose of the study is to analyse the study on risk factors, vaccination status and outcome of tetanus in Pakistan.

Methodology of the study:
This cross sectional study was conducted in Combined Military Hospital, Multan during December 2018 to May 2019. The data was collected from 200 children of both genders. The diagnosis of tetanus was clinical, based on medical history and examination, determining the presence of at least three of the following clinical findings: severe trismus, refusal to feed, generalised muscle rigidity, opisthotonus or spontaneous tetanic spasms. Blood samples were taken within one hour of admission. Laboratory measurements included full blood count, electrolytes, creatinine and glucose.

Statistical analysis:
All the data were analysed using SPSS version 21.0. All the values were expressed in mean and median range.

RESULTS:

The data was collected from 200 patients. There were 67(63.5%) males and 33 (36.5%) females. Overall, the mean age was 6.56+3.15 years, and the commonest age group at presentation was 6-10 years with 38(51.4%) cases. 50(67%) were unvaccinated, none (0%) had received booster dose and post-trauma immune prophyl axis. The case fatality was therefore 61.8%, and did not vary significantly over the 14 years (P = 0.536). Age at admission, presence of inflamed umbilicus, prostration, number of spams per 5 minutes, NT score and presence of hypoglycaemia were all associated were all significantly associated with death in the uni-variable analysis.

Table 01: Mode of infection in tetanus

Age (years)	Non-protection detected by TQS		Non-protection detected by ELISA	
	n (%)	OR (95% CI)	n (%)	OR (95% CI)
1	22 (42.3)	1.00	24 (46.2)	1.00
2	24 (40.0)	0.91 (0.43, 1.93)	24 (40.0)	0.78 (0.37, 1.65)
3	33 (54.1)	1.61 (0.76, 3.39)	35 (57.4)	1.57 (0.75, 3.31)
4	26 (76.5)	4.43 (1.69, 11.63)	25 (73.5)	3.24 (1.27, 8.27)
5	24 (70.6)	3.27 (1.30, 8.21)	24 (70.6)	2.80 (1.12, 7.01)
6	8 (50.0)	1.36 (0.44, 4.20)	8 (50.0)	1.17 (0.38, 3.58)
7	6 (50.0)	1.36 (0.39, 4.80)	6 (50.0)	1.17 (0.33, 4.10)
8	16 (88.9)	10.91 (2.27, 52.41)	15 (83.3)	5.83 (1.51, 22.60)
9	7 (41.2)	0.95 (0.31, 2.90)	7 (41.2)	0.82 (0.27, 2.48)
Total	166 (54.6)	–	168 (55.3)	–

DISCUSSION:

That risk of non-protection against tetanus increases with increasing age was not surprising. Previous reports have shown that immunity against tetanus wanes with increasing age. Many of the caregivers who participated in the study could not provide tetanus immunization card, therefore it may be rational to administer booster dose of TT to children in similar situation, especially if they are male, not first born of their mothers and history of recent TT injection is lacking [7]. In addition, children who present with tetanus-prone wound in the emergency unit would benefit from anti-tetanus immunoglobulin. The strategy of immunizing at every opportunity is recommended by the Global Advisory Group of the WHO Expanded Programme on Immunization (EPI) since 1983 [8].

Tetanus has remained a public health problem in developing countries with high case fatality rates. Efforts of neonatal, childhood and maternal elimination through vaccination have faced challenges in these parts of the world due to low health awareness, shortage of human and material resources and poor health seeking behavior for trauma [9]. Due to the very nature of tetanus, hospital based studies are found to be an effective means for collecting information on the epidemiologic and clinical data on neonatal and childhood tetanus, and also for evaluating the impact of immunization programs [10].

CONCLUSION:
It is concluded that this study has documented high case fatality rates in Pediatric tetanus in the study area. Closer follow-up of patients to identify the progress of severity assists in identifying cases that require respiratory support and drug escalation.

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