Original Article

Prognosis of Childhood Tetanus (Age Group 1-12 Years) in Cases Presented in DHQ Teaching Hospital DGK

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ABSTRACT

Objective: To evaluate the prognosis of non neonatal tetanus in children.
Study Design: Prospective observational study
Place and Duration of Study: This study was conducted at the Department of Pediatrics Medicine, DHQ Teaching Hospital, Dera Ghazi Khan from January 2018 to January 2019.
Materials and Methods: A total of 80 children, aged 1-12 years, diagnosed with tetanus, admitted to pediatrics department, were enrolled in this study. Diagnosis was confirmed by clinical evaluation by minimum of 2 independent pediatricians. Courses of illness along with effects of management during hospital stay and on followup visits were recorded in all patients by collecting data from patients or their patents / guardians.
Results: Out of a total of 80 children, there were 43 (53.8%) male and 37 (46.2%) female. Mean hospital stay was noted to be 16.3 days with a standard deviation of 3.6 days. Mean incubation period was 6.5 days with a standard deviation of 1.7 days. Mortality was reported in 2 (2.5%) children,while serious complications were observed in 8 (10.0%). Aspiration pneumonia was the commonest complication, found in 6 (7.5%). We noted 60 (75.0%) children to be unvaccinated.
Conclusion: Prognosis was better in our setting in comparison to most of the other studies. Case fatality rate was 2.5% while most of the children (75.0%) presentedwith tetanus were unvaccinated.

Key Words: Tetanus, prognosis, incubation period, unvaccinated

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INTRODUCTION

Tetanus is serious, spastic paralyzing illness caused by neurotoxin "tetanospasmin" produced by clostridium tetani, a gram positive spore forming obligate aerobic bacillus. Tetnospasmin is second most poisonous substance known after botulinum.[1] Tetanus is preventable and both active and passive immunizations are available.[2] Although number of affected people and case fatality rate decreased worldwide after introduction of vaccination in to routine vaccination program in 1940s, but in our country it is still a common illness to encounter.

Case-fatality rates from tetanus vary from 20% to 70% depending on treatment, age and general health of the patient.[3]Many advances have been made since in its prevention and management but It is still a common disease in developing countries like Pakistan.[5] It mainly involve younger children due to lack of immunization and poor management of open wounds.[4]Its prevention is cost effective than treatment, especially for resource limited countries like Pakistan. There is special interest shown worldwide to reduce the mother and neonatal tetanus, non-neonatal tetanus is relatively ignored and studied less.[6,7] Although it is major health concern in areas like subcontinent, not much data is available for tetanus beyond neonatal periods, as quoted from Manish Narang "the exact incidence of neonatal tetanus in India is unknown".[8] Mortality, as described in PICU based study done in Civil hospital Karachi was 26%.[2] Prognosis of cases with tetanus depends upon multiple factors e.g. age, incubation period, route of injury, complications, and delays in treatment or prophylaxis. This study was aimed to study the prognosis of non-neonatal tetanus in age group 1-12 years admitted to Teaching hospital Dera Ghazi khan.

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MATERIALS AND METHODS

This was a prospective observational study, conducted at the department of pediatrics medicine, DHQ Teaching Hospital, Dera Ghazi Khan, from 1st January 2018 to 1st January 2019. A total of 80 children, aged 1-12 years, diagnosed with tetanus, admitted to pediatrics department, were enrolled in this study.

Diagnosis was confirmed by clinical evaluation by minimum of 2 independent pediatricians. Case definition was based on the clinical criteria highlighted by the presence of lock jaw, hypertonia, seizures on stimulation and tisussardonicus. Children with other causes of seizures and hypertonia like meningoencephalitis, cerebrovascular accident (CVA), electrolyte imbalance, and epilepsy were ruled out on clinical and laboratory investigation where necessary. Courses of illness along with effects of management during hospital stay and on follow up visits were recorded in all patients on a predesigned proforma, by collecting data from patients, parents or their guardians. All the data was entered and analyzed by using SPSS version 20.

RESULTS

Out of a total of 80 children, there were 43 (53.8%) male and 37 (46.2%) female. Most of the children, 31 (38.8%) were between the age of 1 to 5 years, 30 (37.5%) between 5.1 to 6 years while 19 (23.7%) above 10.

Mean hospital stay was noted to be 16.3 days with a standard deviation of 3.6 days. Mean incubation period was 6.5 days with a standard deviation of 1.7 days.

Focus of infection was unknown in 54 (67.5%) children, thorn prick in 5 (7.1%),road traffic accidents (RTA)in 8 (10.0%),ear infection in 4 (5.0%), fall and open wound in 4 (5.0%), minor skin abrasion in 3 (3.8%) and knife cut in 2 (2.5%)

Serious complications were observed in 8 (10.0%). Aspiration pneumonia was the commonest complication, found in 6 (7.5%), apnoea in 1 (1.25%) and ventilator support was required in 1 (1.25%).

We noted 60 (75.0%) children to be unvaccinated, 13 (16.3%) had vaccination status as unknown while only 7 (8.7%) were vaccinated but no booster dose was done in these children.

Table No.1: Distribution of Children in terms of Age Groups and Gender

Gender	Age Groups			P Value
	1-5 (n=31)	5-10 (n=30)	10-12 (n=19)	
Male	15 (48.4%)	14 (46.7%)	14 (73.7%)	0.135
Female	16 (51.6%)	16 (53.3%)	5 (26.3%)	

Tablet phenobarbital 3mg/kg/day, tablet valium 0.8mg/kg/day or tablet rivotril 1.5mg/kg/day were used as anticonvulsants. In 11 (13.8%), continuous infusion midazolam (2 microgram/kg/min) was given. In terms of antibiotics, Injection ceftriaxone as 75 mg/kg/day, injection benzyl penicillin(4 lac units/kg/day) were used initially.In 5 (7.1%) patients,antibiotics were changed to injectionMeropenumand injection amikacin and in one (1.25%) injectionvancomycinwas administered. Tablet Baclofen 10mg/kg/day was given to 3 (3.8%) patients.

Mortality was reported in 2 (2.5%) children. Seventy Five (93.75%) children were fully cured and got discharged. No neurological sequelae were observed at the time of discharge

Table No.2: Data of Two Expired Children

Age (years)	4	8
Gender	1 male	1 female
Incubation period	Unknown	7 days
Vaccination status	Unvaccinated	Unvaccinated
Hospital stay (days)	2	1
Source	Unknown	Ear infection

DISCUSSION

Although, vaccination initiatives are seen to produce significant triumph around the world but still, many challenges are in front achieving absolute success in a country like Pakistan. Control of spasm along with improvement in cardiovascular stability, proper wound debridement, anti-toxins, antibiotics and other necessary supportive care are the corner stones for the treatment of tetanus.[9]

We noted more males as compared to females in the current study. Overall male predominance in our society could be the reasons for this as male get more attention in terms of healthcare facilities. In a 2 year study conducted at PICU from Karachi showed that 52% children with tetanus were male which is pretty similar to what we found in our study.[2]

In the present study, 39% children were between the age of 1 to 5 years. Similar findings have been seen in another local study where they found majority (57%) cases between 2 to 6 years of age.[2]A study conducted in Mumbai, India[10] found similar results in terms of most common age group among children with tetanus.

In our study, otogenic route was seen in all children from 1 to 5 years of age which is pretty similar to other finding from Karachi.[2]Dirty fingers are most commonly used in to ears in this age group that could be a reason for this finding.[10]

We noted 60 (75.0%) children to be unvaccinated, 13 (16.3%) had vaccination status as unknown while only 7 (8.7%) were vaccinated but no booster dose was done in any of the children. Tetanus is totally preventable if proper and timely immunization is done.[11] A 5 dose regimen of tetanustoxoid givessufficient immunity. The shocking finding in our study were that in this 21st century, a disease which is easily preventable and recommendation of immunization dosing and schedules are clear, large number of population is still affected due to lack of vaccination. The cost of treatment is far more than prevention in a country like ours.

Mortality was reported in 2 (2.5%) children in our study while 94%children were fully cured and got discharged whereasno neurological squeale were observed at the time of discharge. Local data from Karachi[2] reported a much higher mortality rate as 26% so we observed that prognosis of non-neonatal tetanus was good in our settings as most of the children discharged and on follow-up no residual disease was discovered.

Globally, lots of advancement has been made in the past few decades to reduce the morbidity and mortality related to tetanus.[13] However, it is still causing major health issues in developing countries like Pakistan.[14,15] Lack of proper immunization coverage for the prevention of maternal as well neonatal / non neonatal tetanus is contributing towards the burden of this disease in our country while boosting collective efforts for universal vaccination in the developed countries have brought lots of success.[16-18] Restrictions to proper financial and human resource are the major reason why a totally preventable disease like tetanus is still haunting us. Proper strategy to vaccinate all and awareness about the overall disease and its preventive aspects can surely bring fruits regarding tetanus and its manifestations in our country.[19,20]

CONCLUSION

Prognosis was better in our setting in comparison to most of the other studies. Case fatality rate was 2.5% while most of the children (75.0%) presented with tetanus were unvaccinated.

Author's Contribution:

Concept & Design of Study:	Mukhtar Ahmad
Drafting:	Asma Akbar, Ayaz Ali
Data Analysis:	Sara Ilyas Khan, Sidra Choudhary
Revisiting Critically:	Mukhtar Ahmad, Asma Akbar
Final Approval of version:	Mukhtar Ahmad

Conflict of Interest: The study has no conflict of interest to declare by any author.

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