British Journal of Medicine & Medical Research
12(2): 1-5, 2016, Article no.BJMMR.19047
ISSN: 2231-0614, NLM ID: 101570965

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Post Neonatal Tetanus: 20 Years Experience as Seen at the University of Port Harcourt Teaching Hospital

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Authors' contributions

This work was carried out in collaboration between the both authors. Author LEYI designed the study, wrote the protocol and managed the data collection. Authors LEYI and TAUO analysed the data, wrote the first draft of the manuscript and managed the literature searches. Both authors read and approved the final manuscript.

Article Information

DOI: 10.9734/BJMMR/2016/19047
Editor(s):
(1) Thomas Britt, Chair, Department of Health Studies, College of Health Sciences, Chicago State University, USA.
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(4) Ben slama fethi, National Institute of Public Health, France.
Complete Peer review History: http://sciencedomain.org/review-history/12036

Original Research Article

Received 23rd May 2015
Accepted 12th September 2015
Published 30th October 2015

ABSTRACT

Aims: To review the status of post neonatal tetanus at University of Port Harcourt Teaching Hospital with a view of highlighting the morbidity and mortality trend.
Study Design: Retrospective descriptive study.
Place and Duration of Study: Department of Paediatrics, University of Port Harcourt Teaching Hospital between1995-2015.
Methodology: This was a 20 year retrospective review of the records of all post neonatal tetanus cases managed at Department of Paediatrics, University of Port Harcourt Teaching Hospital.
Results: One hundred and fourteen cases of post neonatal tetanus were studied. Male to female ratio was 1.7:1. The ages ranged from 0.16 to16 years with a mean age of 9.74±4.4 years. Most cases were above 5years of age and either unimmunized or incompletely immunized. The portal of entry was specified in 37 (32.7%) of cases and of these, broomstick injury was the commonest

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portal of entry accounting for 17 (45.9%). The duration of hospital stay ranged between 1-35 days and case fatality rate was 27.4%.
Conclusion: Post neonatal tetanus has remained a major cause of morbidity and mortality in our Teaching Hospital. Injuries especially broomstick injuries predispose to the majority of the cases. Completion of routine tetanus toxoid immunization in infancy and booster doses should be ensured.

Keywords: Post neonatal tetanus; immunization; morbidity and mortality; trend; paediatrics; contributing factors; school health; prevention.

1. INTRODUCTION

Tetanus though a vaccine preventable disease is still a major public health problem throughout the world and has remained a major cause of morbidity and mortality especially in developing countries [1,2]. Community-based surveys have demonstrated underreporting of neonatal tetanus cases [3]. About half of the World's under-five deaths in 2013 occurred in only five developing countries: India, Nigeria, Pakistan, Democratic republic of Congo and China [4]. India and Nigeria together account for more than a third of the Under-five deaths Worldwide [4]. 6.3 million Under 5's died in 2013, nearly 17,000 deaths everyday [5]. Annually tetanus causes 309,000 deaths and an estimated one million cases occur especially in the developing countries [6].

Post neonatal tetanus is a growing problem in developing countries including Nigeria [7]. However, in most developed countries where immunization coverage is high the disease has come under control with very low mortality rates, in the United States, from 2001 through 2008, a total of 233 cases were reported in 45 states with an average of 29 cases per year and average annual incidence of 0.10 per 1 million population [8]. Despite the widespread availability of effective vaccine against tetanus for several decades, yet post neonatal tetanus is still prevalent in most developing countries due to poor immunization coverage, lack of sustainable immunization programmes and deficient booster doses of tetanus toxoid at appropriate period to eligible children. In Nigeria only 38% of children received 3 doses of DPT vaccine [9]. 72% of infants in Nigeria are not fully immunised against tetanus (have not completed the primary series of DPT1-3) [9].

The prevalence of post neonatal tetanus in Nigeria is unknown, but tetanus is responsible for 4% of Neonatal deaths in Nigeria [9], however Anah et al. [10] in their review on post-neonatal tetanus in Calabar, Cross River state, Southern Nigeria reported an incidence of 1.1% while Oyedeji et al. [11] in their review in Osogbo, Osun state Western Nigeria reported an incidence of 2.7%. Most studies have identified tetanus beyond the neonatal period as a problem of immense magnitude with high case fatality rate yet it is still apparently neglected and continues to afflict several children in this millennium [11,12]. This study is aimed at reviewing the trends, morbidity and mortality burden of post neonatal tetanus over a 20 years period with a view of highlighting the current situation in our Center, identifying contributing factors and possibly suggesting ways to stop this scourge.

2. MATERIALS AND METHODS

This was a retrospective analysis of the data obtained from the records of all post neonatal tetanus cases managed at the University of Port Harcourt Teaching Hospital from 1995 to 2015. All cases were diagnosed by Paediatricians using the clinical features of the disease. Details obtained included socio demographic data of patients, presenting complaints, history of the illness, relevant immunization history, examination findings, management, duration of hospitalization and outcome of the illness. All cases were admitted into the tetanus side room of the children's ward. They all received anti tetanus serum (ATS), intravenous antibiotics and spasms were controlled with a combination of phenobarbitone, chlorpromazine and diazepam.

Data was analysed using SPSS version 20.0 and presented as simple frequencies and in tables.

3. RESULTS

One hundred and fourteen cases of post neonatal tetanus were studied. There were 71 (62.3%) males and 43 (37.7%) females giving a male to female ratio of 1.7:1. Their ages ranged from 0.16 to16 years with a mean age of 9.74±4.4 years. Amongst these 114 cases

studied, 90 (78.9%) were above 5 years of age. Table 1 shows the demographic characteristics and outcome of children with post neonatal tetanus.

Table 1. Characteristics and outcome of the children with post neonatal tetanus

Characteristics	Total	Percentage
Age groups		
<5 years	23	20.2%
5-9 years	25	21.9%
≥10 years	66	57.9%
Sex		
Male	71	62.3%
Female	43	37.7%
Outcome		
Discharged	63	55.3%
Parental discharge	20	17.5%
Death	31	27.2%

The portal of entry was specified in 37 (32.7%) of cases and of these, broomstick injury was the commonest portal of entry accounting for 17 (45.9%). The mother's educational status was not indicated in most of the records, 98 (97:85%), 2 (1.8%) had no formal education, 9 (7.9%) had primary education, 3 (2.6%) secondary education and 2 (1.8%) tertiary education. Only 8 (7.0%) were fully immunized according to the National Programme on Immunization schedule (NPI) and 5 (62.5%) of those who were fully immunized survived. The duration of hospital stay ranged between 1-35 days. 63 (55.3%) children survived, 20 (17.5%) were either discharged against medical advice or absconded from the hospital while 31 (27.2%) died.

4. DISCUSSION

This study revealed a total of 114 cases of post neonatal tetanus over the 20years study period. This is quite high compared to another study conducted by Chukwuka et al. [12] over a 10 year period in Nnewi where only 26 cases of tetanus (neonatal and post neonatal) was reported but comparable with the 67 post neonatal cases reported by Anah et al. [10] in Calabar over a 10year period. The finding of more males with post neonatal tetanus in our study is consistent with other studies [10-13] .Could this possibly be attributed to their risk taking behavior which puts them at risk of injuries? The occurrence of tetanus in our study at a mean age of 9.74±4.4 years is similar to the reports from other parts of Nigeria, Emodi et al. [14] in Enugu, Chukwuka et al. [12] in Nnewi and Gbadegesin et al. [13] in Ibadan which may be attributed to the fact that the levels of protective neutralizing tetanus antibodies among this age group may have dropped to non-protective levels. This is further supported by Aboud et al. [15] who reported low levels of protective antibodies to tetanus in Tanzanian children aged 6-15 years following routine immunization in infancy. This highlights the need to target school age children, in the control of post neonatal tetanus. Only 8 (7.0%) of the 114 patients in our study were fully immunized according to the NPI schedule (received 3 doses of DPT in infancy as primary immunization), none of our patients received more than 3 doses of tetanus toxoid, this low level of immunization have also been documented by other authors in Nigeria [16-18]. According to the Nigerian NPI schedule, immunization against tetanus is only provided for pregnant women and infants. The children who miss immunization at infancy are susceptible and contribute to the cases of post-neonatal tetanus seen in the present study. The three doses of TT given in infancy give protective levels of antibody for up to 3-4 years of age and these antibody levels subsequently wanes with time as such even children who had 3 doses of TT according to the NPI schedule may still be susceptible to tetanus infection after 3-4 years of age [19]. In most developed countries, four to five TT vaccination are given as part of the primary immunization (3 doses in infancy, one at age 15-18 months and one at 4-6 years) and this is followed by booster doses 10years thereafter [20]. This further calls for the need to strengthen and improve the immunization schedule in Nigeria with the view of targeting school age children and therefore control post neonatal tetanus.

Among the identified portal of entry, broomstick injury accounted for the majority (45.9%) of cases which contrasts with the finding by Akuhwa et al. [17] who reported suppurative otitis media and circumcision by traditional surgeons as major portals of entry.

The case fatality rate in this study was 27.2% which falls within the range of 15-40% mortality reported by other authors in Nigeria [10,12,14].

5. CONCLUSION AND RECOMMENDATION

Post neonatal tetanus has remained a major public health problem with high morbidity and mortality rates especially in developing countries like ours.

We recommend improvement in the level of awareness about tetanus and the importance of immunization. Vaccination of children with booster doses of tetanus toxoid at primary and secondary school entry should be introduced as part of the routine immunization schedule.

Parents/care givers should be discouraged from using potentially harmful objects like broomstick to flog children.

The knowledge gained in this study should be in the routine care of tetanus patients.

6. LIMITATIONS

There were repeated strikes by the health workers in 2014 and so most cases would have presented to private health facilities to seek medical care. Poor record keeping system in our hospital resulting in a lot of missing data and the values used in this study are actually an underestimate of the true picture.

CONSENT

It is not applicable.

ETHICAL APPROVAL

It is not applicable.

ACKNOWLEDGEMENT

We had no sponsors for this work. There are no conflicts of interest.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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Peer-review history:
The peer review history for this paper can be accessed here:
http://sciencedomain.org/review-history/12036