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The Socio-Economic Challenges in Post Neonatal Tetanus

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Abstract

Background: Tetanus has remained a major public health problem worldwide although it is a vaccine preventable disease. It is a major contributor to under-five morbidity and mortality globally. Its effect is worse in developing countries such as Nigeria. Aims and Objectives: To highlight the socio-economic challenges in the management of Post neonatal tetanus at the University of Port Harcourt Teaching Hospital, Nigeria. Study Design: A Retrospective Descriptive study. Place of Study: University of Port Harcourt Teaching Hospital. Methods: Report of the socio-economic challenges in the management of three consecutive cases of Post neonatal tetanus at the University of Port Harcourt Teaching Hospital from February to April 2015 was studied. Data on socio-economic variables were retrieved from case notes of the patients. Results: These were three patients, two females and a male. Their ages were 11 years old of the two females and 14 years old of the male. None was immunized with tetanus toxoid in infancy. All three children survived. They were all from low socio-economic class, two mothers were petty traders while one was unemployed, only one mother had complete secondary education. One mother was immunized in pregnancy, while one mother was married. Conclusions: The socio-economic challenges of tetanus are immense, but could be prevented by simple measures such as education of the girl child, immunization of all school children, raising community awareness among other measures, and strengthening the school health program.

Keywords

Post-Neonatal Tetanus, Socio-Economic Challenges, Immunization, School Health Program

1. Introduction

Tetanus is an acute spastic paralytic illness caused by the neurotoxin produced by *Clostridium tetani* [1]. Al-

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though total eradication of this disease is not likely because of the presence of tetanus spores everywhere in the soil and stool of animals, vaccination against the disease can effectively protect susceptible individuals [2].

This vaccine preventable disease is associated with both neonatal and post neonatal morbidity and mortality in developing countries of Africa and Asia including Nigeria [3]-[5]. Recent analysis of data from 2000 to 2010 showed that neonatal tetanus decreased in Africa and accounted for 20,000 - 276,000 neonatal deaths (1% of all child mortality) in 2010 [6]. On the other hand, post neonatal tetanus accounted for less than 1% of global child mortality [6]. In Nigeria, of the 5 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 [7].

World Health Organisation (WHO) recommends administration of three doses of tetanus toxoid as one of the vaccines for routine immunisation programme to all infants and booster doses during adolescence and pregnancy in order to achieve elimination of tetanus in early childhood [8]. 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 towards achieving this goal but some are not [9]. Nigeria is one of the 27 countries currently accounting for 90% of the global burden of the disease [10].

Post neonatal tetanus is a growing problem in developing countries including Nigeria [3] [11]. Unlike neonatal tetanus whose incidence seems to be on a decline [6], evidenced by a reduction in the number of neonates admitted into our facility with the disease, post neonatal tetanus has been on an increase, with one new admission monthly in the last three months. Low immunization coverage and deficient booster doses of tetanus toxoid at appropriate period to eligible children are some of the reasons contributing to the high burden of the disease in Nigeria [3] [12] [13]. However, there are some other factors that affect our health [14]. These factors include individual lifestyle, social and community influences, and living conditions. The impact of these factors on our health can be affected positively by modifying our individual and/or societal behavior [14].

Evaluation of three cases of post neonatal tetanus admitted within a period of three months at the University of Port Harcourt Teaching Hospital was done to highlight the socio-economic challenges in post neonatal tetanus. Suggestions that will enhance a reduction in this disease burden will also be provided.

2. Methodology

The case notes of three consecutive cases of post neonatal tetanus admitted within a period of three months from February 2015-April 2015 at the University of Port Harcourt Teaching Hospital was retrieved and reviewed to extract information on the socioeconomic challenges encountered in the course of management.

Information obtained included the route of infection, vaccination status both mother and child, parents' marital status and mothers level of education, parents social class using social class classification by Oyedeji, cost of treatment, duration of hospital stay and outcome of illness.

The diagnosis of tetanus was clinical, based on the presenting symptoms which are classical for tetanus.

2.1. Case Report 1

S.E. is an 11-year-old female, who was admitted on 16-2-2015 with: two weeks history of Stiffness and pain in the left upper limb, four day history of inability to open the mouth, body spasms and fever. There was an antecedent history of being flogged with broom by the mother, especially in the left upper limb for selling fuel to his mother's debtor prior to onset of symptoms Aboniki balm was applied to upper limb once She was Massaged at a traditional bone setters for two daysReceived I.V antibiotics and sedatives at private hospital. Mother received TT during pregnancy.

Child was not immunized in infancy due to grandmother's burial. Patient was a junior secondary 2 student, the 4th of 6 children of parents. Mother is a 33-year-old trader (sells food items) with incomplete secondary education, dropped out of junior secondary three. Father is a 40-year-old block moulder with complete secondary education. On examination at presentation, was having repeated provocative spasm lasting less than 5 seconds. She was conscious, had neck stiffness, opsithotonic posture, trismus and risussadonicus. Left upper limb was held in fixed flexion at wrist and phalanges and normal tones in other limbs in between spasms. Other system examinations were essentially normal. She was managed as a case of generalized tetanus. The results of investigations and treatment received are tabulated below. She got better and was discharged home after spending 1 month on admission.

2.2. Case Report 2

U.K. is a 14-year-old male, who was admitted on 18-3-15 with: two weeks history of Puncture wound on the sole of the left foot from a bamboo stick, three days history of generalized body pains, one day history of inability to open his mouth, one day history of body spasms. He received oral medications and IM T.T at a chemist and hot compress was applied to the wound there after he was taken to church for prayers. He was not vaccinated in infancy due to his mother's ignorance. He is a junior secondary school 1 student. Ist child of a young single mother who is a 29 year old unemployed woman with secondary level of education. Father is a married farmer who has no knowledge of his son. Upkeep is provided for by grand mother who is a farmer. On examination at presentation, he was having intermittent spontaneous and provoked spasms lasting less than 3 seconds He was conscious, had neck stiffness, opisthotonic posture and global hypertonia Other systemic examinations were essentially normal

He was managed as a case of generalized tetanus He got well and was discharged home after spending 5 weeks on admission.

2.3. Case Report 3

O.P. is an 11-year-old female, brought into CHEW with complaints of: Spasms of 4 days duration inability to open mouth and generalized spasm of 4 days duration. There was a preceding history of mother flogging the child a week before onset of symptoms. At onset of symptoms, she received paracetamol, and capsule ampicillin one tablet three times daily for three days. But on worsening of symptoms, presented to a private hospital where they were verbally referred to University of Port Harcourt Teaching Hospital. She was inadequately immunised as she did not receive TT in infancy, received only OPV at birth till 6/12 after which no form of immunization was given till date Mother explains that she only receives immunization from a mobile immunization team and they only gave OPV. She is currently in primary 5 and performs fairly in school. she is the 1st of 4 children of a widowed mother

Mother is a 32-year-old corn seller with primary level of education. Father died 3 years ago from complications of typhoid fever. Family lives in a batcher Upkeep of the family is provided by father's nephew, who is a tricycle rider and takes care of 7 children in total. On examination at presentation, she was having intermittent spontaneous and provoked spasms, lasting less than 5 seconds; she was febrile, temperature (38˚C). She was conscious, well oriented, and has neck stiffness++, opisthotonic posture with generalized spasms, increased tone in all limbs during spasm, and splenomegaly (13 cm below costal margin). Other systemic examinations were essentially normal. She was managed as a case of generalised tetanus. The results of investigations and treatment received are tabulated below. She got well and was discharged (**Tables 1-3**).

The cost of treatment for the duration of hospitalization excluding for drugs is tabulated below.

3. Discussion

The cases were aged 11 years and 14 years respectively. All the cases were unimmunized in infancy which is similar to reports documented by previous studies [3]-[5] [16]. Although they were unimmunized against the disease in infancy, they were also eligible for booster doses which they also failed to receive. After the primary series of DPT 1 - 3 there is a dwindling of the level of antibodies in the body resulting in low levels of protective antibodies within the adolescent age as documented in previous findings [3] [13] [15]-[17]. The mothers of these children were ignorant of this and so did not immunize their children.

A review of the cases revealed that the portal of entry was through broomstick injury in the upper limbs in the two female cases and bamboo stick prick in the lower limb in the male case. This is unlike previous documentations where lower limb injuries accounted for the portal of entry in most cases of the disease [4] [5] [15] [16] [18]. Flogging with broomstick is noted as a common source of infection in this part of the country where many of the patients admitted into our facility for post neonatal tetanus especially females were flogged with broom. Although flogging children with broom is forbidden in several cultures in the country, its frequent occurrence and implication in post neonatal tetanus has become a serious case of concern. The reason for being flogged was because case 1 sold fuel to a debtor and case 2 did not take care of her younger ones as she was told to when her mother went to the farm.

The patients all belonged to low social class, which is similar to previously documented reports by Adegboye

Table 1. Investigations.

Investigatons	Case Report 1	Case Report 2	Case Report 3
FBC PCV	29%	30%	30% (At admission) 19% (one week after) 27% (post transfusion)
WBC DIFFERENTIALS	7×10^9/L Neut. 57% Lymph. 29% Mono. 7% Eosino. 7%	3.7×10^9/L Neut. 45% Lymph. 42% Mono. 7% Eosino. 5% Baso. 1%	2.95×10^9/L Neut. 44% Lymph. 30% Mono. 21% Eosino. 5%
PLATELETS	336×10^9	216×10^9	225×10^9/L
BLOOD FILM	----------	----------	RBC: Severe hypochromia with microcytic and macrocytic cells, few normocytes seen WBC: white cells appear reduced in film. Neut show left shift to band forms. PLATELETS: Anisocytosis IMPRESSION: Sepsis? r/o bacterial, viral Severe anaemia likely nutritional (fe or vit b_{12})
URINALYSIS	Blood negative Urobilinogen negative: Bilirubin: positive Protein: negative Nitrite: negative Ketones negative: Ascorbic acid: negative Glucose: negative PH: 6	Blood negative Urobilinogen negative: Bilirubin: positive Protein: negative Nitrite: negative Ketones negative: Ascorbic acid: negative Glucose: negative PH: 7	Blood negative Urobilinogen positive Bilirubin: positive Protein: negative Nitrite: positive Ketones negative: Ascorbic acid: negative Glucose :negative PH: 6
E/U/Cr(mmol/l)	1st 2nd Na: 140 140 K: 4.2 2.7 Urea: 2.5 1.5 Bicarb: 23	Na: 136 K: 3.7 Bicarb: 27 Urea: 2.1 Cr: 85	1st 2nd Na: 132 132 K: 4.2 4.6 Bicarb: 23 18 Urea: 3.6 3.5 Cr: 60 50
Abdominal scan	USS: enlarged liver 16.31 cm in craniocaudallenght. No intra/extra hepatic biliary/vascular channels dilatation. No mass seen.	----------	T.B: 7 umol/l C.B: -- AST: 81 U/L ALT: 48 U/L ALP: 170 U/L γGT: 214 U/L Total Protein: 83 g/l Albumin: 27 g/l
Blood film for M.P	----------	Trophoites of P. Falciparum seen +	Trophozoites of P. Falciparum RVS: seronegative HbsAg: negative HCV: negative

Table 2. Treatment.

Case Report 1	Case Report 2	Case Report 3
ATS 60,000units stat Tetanus toxoid × 2 doses Tabs largactil 25 mg - 50 mg 6 hrly alternating with tabs phenobarb 30 mg - 150 mg 6 hrly Tabs Robaxin 500 mg 6 hrly Tabs coartem iii bd x3/7 I.V crystapen 1.5mu 6 hrly I.V flagyl 250 mg 8 hrly I.V diazepam 10 - 20 mg in 500 mls of IVF 4.3% D/S 8 hrly - 12 hrly	ATS 60,000 units stat Tetanus toxoid × 2 doses Tabs largactil 25 mg - 50 mg 6 hrly alternating withtabs phenobarb 30 - 150 mg 6 hrly Tabs Robaxin 500 mg 6 hrly Tabs coartem iii bd x3/7 I.V crystapen 1.5mu 6 hrly I.V flagyl 250 mg 8 hrly I.V diazepam 10 - 20 mg in 500 mls of IVF 4.3% D/S 8 hrly - 12 hrly	ATS 60,000 units stat Tetanus toxoid × 2 doses Tabs largactil 25 mg - 37.35 mg 6 hrly alternating withtabsphenobarb 30 mg - 150 mg 6 hrly Tabs Robaxin 500 mg 6 hrly Tabs coartem iii bd x3/7 Tabs Clindamycin 150 mg 6 hrly I.V crystapen 1.5mu 6 hrly I.V flagyl 250 mg 8 hrly I.V diazepam 10 - 20 mg in 500 mls of IVF 4.3% D/S 8 hrly - 12 hrly I.V Rocephin 1.5 g daily I.V Genticin 50 mg 8 hrly

Table 3. Treatment cost.

Feeding	N1000 per day (average of N35,000 for 4 - 6 ks) about 150 US dollars
Nursing care	Average of N50,000 about 250 US dollars
ICU care	N15,000 – N20,000 per day about 100 US dollars
Physiotherapy	N20,000 about 100US dollars

et al. and Alhaji *et al*. [15] [16] this severely affected the management of the patients, as their parents were only able to provide for only few of the needs of the patients while they were on admission. The members of the managing unit, nursing staffs, social workers and hospital management had to assist in providing the medical needs of the patients. In fact, one of the reported cases depended almost entirely on the charity of the managing unit for all her needs while on admission, ranging from food to diapers, laboratory investigations and drugs including anti tetanus serum. The mean cost of the nursing care (including some consumables) while on admission was N50,000 about 250US dollars, which did not include drugs, feeding, toiletries and payment for physiotherapy. When the costs of physiotherapy and feeding are added, the medical bill escalated to N100,000 about 500 US dollars. The patients ought to have been nursed in the intensive care unit (ICU), but due to the expensive cost of care, they were nursed on the ward in the tetanus room, with frequent monitoring by the medical teams. To these patients who had parents with low socioeconomic status, this was enormous. The total cost of care is far above the recommended minimum wage in the country of 90 dollar per month [19]. At discharge, the patients spent extra days on the ward, while their parents sourced for the hospital bills. Only one of the patients' bills was fully paid off. Another made part payment and promised to pay off the bills on follow up in clinic after discharge, but never did. The third patient's hospital bill was paid by a charity group from a church.

The mean duration of hospital stay was four weeks. This is similar to documentations in the south east [21], south west [20] and northern parts of the country [21]. This prolonged stay on admission in the hospital further hampered the care of these patients with resultant financial constraints on their families, neglect of other family responsibilities with stretching of the financial involvement of the medical team. In fact, the younger siblings of one of the patients were left in the care of neighbors.

4. Conclusion

There is a need to strengthen the school health program and ensure that every child of school age in Nigeria is vaccinated with Tetanus toxoid. The cost of treatment for tetanus should be subsidized by the government of Nigeria. Every female of child bearing age should be vaccinated. Parents should be discouraged from flogging their children with broomstick.

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