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STUDY OF CLINICAL PROFILE OF TETANUS PATIENTS AT ID & BG HOSPITAL, KOLKATA

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Abstract

Background: Tetanus is an important cause of morbidity and mortality in developing countries though it is rare in developed countries. Individual and social consciousness 'about the care of wound and need of immunization are the prime factors for prevention. Knowledge about the need of active and passive immunization for wound is still not encouraging. **Materials and methods:** This one year study was conducted among the patients admitted at IDBG Hospital, Kolkata with tetanus. Site of entry, incubation period, on-set time, clinical presentation, complication and outcome were measured. The socio economic status, age and sex distribution, seasonal variation, consciousness about the preventive measures among family members or relatives were analyzed. **Results:** Among total 134 patients, 39 died (29.10%). Male : female ratio was 1.43 : 1, mean and median age of presentation was rural-urban ration was 4.36 : 1, 73.13% was below poverty level and 26.86% was above, poverty level. Most of the patients were admitted in the months of January, April and July. Wound of entry were 52.40% in lower limbs, 20.89% were in upper limbs, 11.94% in the ear and 11.94% were unknown. Immunization status was complete in 11.19%, in-complete in 75.37% and never taken in 13.43%. No cases were taken immunoglobulin. Awareness about the need of active and passive immunization among patients above 10 yrs were 50% and 0.1% respectively, among family members or relatives were 62.23% and 0.1%. **Conclusion:** Tetanus is a preventable disease and to prevent it, more awareness in the society is needed. Teaching of proper wound care and immunization are to be emphasized among the common people and health care delivery staffs. The need of booster dose is to be stressed.

Key words: Clostridium Tetani, APL-Above proverty line, BPL-Below proverty line, Trismus, Rigidity).

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Introduction:

Tetanus is an important endemic infection caused by Clostridium Tetani, a gram positive anaerobic spore-bearing organism. It produces exotoxin of which tetanospasmin is responsible for clinical manifestations and the lethal dose for a 70kg man is about 0.1mg [1]. Clinical manifestations are

characterized by rigidity of muscles, painful muscle spasm, lock-jaw, trismus with normal higher function [2]. It commonly affects active age group (5 to 40 yrs.) but neonatal tetanus is still a problem in developing countries. Home delivery, use of non-aseptic measures and non-adherence of antenatal immunization are major causes. The incidence is

declining with EPI (Expanded program on immunization) and NRHM (National rural health mission) in India. Tetanus is a positive environmental hazard. Person close contact with soil, animal husbandry or agriculture, with unhygienic habits and customs, ignorance and lack of health facilities are important environmental and social factors [3]. In 2008 WHO reported 23286 cases of tetanus of which 6658 cases were neonatal tetanus [4]. But in 2012 global figure reduces to 9683 cases [5]. This change reflects encouraging immunization program and people's awareness. India is lagging on vaccine coverage with DPT3 in the 50-70% coverage range whereas the global figure is 85% in the year 2010 [6]. By February 2012, 25 countries including Bangladesh have been validated as having achieved MNT (maternal and neonatal tetanus) elimination. 15 states and union territory of India are also validated for elimination of neonatal tetanus, they are Andhra Pradesh, Chandigarh, Goa, Gujarat, Haryana, Himachal Pradesh, Karnataka, Kerala, Lakshadweep, Maharashtra, Pondicherry, Punjab, Sikkim, Tamilnadu, West Bengal [7]. In 1999 numbers of neonatal tetanus were 11000 but in 2009 it reduces to 889 [8]. Traumatic puncture wound is the major cause of entry having incubation period 6 to 10 days. Males are affected more. Lock jaw and neck rigidity are common presentation and mortality ranges from 40 to 80% [9]. We undertook this study to know the clinical profile of tetanus in the era of massive immunization and to assess the consciousness in the society regarding its preventive measures in a developing country like India.

Material methods:

It is an observational inpatient department study. ID & BG Hospital, Kolkata is the major referral centre for infectious diseases in West Bengal, India. We studied tetanus patients admitted in the hospital from January 2011, to December 2011. Data collections were done from clinical records and communication with patients and their relatives. Demographic and clinical data of the patients were collected which included information about age, sex, socio economic status, seasonal variation, wound of entry, clinical presentation, incubation

period, onset time, time between symptoms and specific treatment, duration of spasm, severity of tetanus, hospital stay, complication, death and immunization status. Patients more than 10 years of age were interviewed about the need of active and passive immunization and wound care. Awareness about need of immunization and wound care was also assessed among 10 family members or relatives of each patient during treatment period. After 3 months of discharge of survived patients, their same relatives or family members were interviewed over mobile phone or during follow up visit of patients. The consciousness about immunization was evaluated again. Incubation period was defined as the time between injury and first symptom (in days), onset-time as the interval between first symptom and first spasm (in hour). Severity of tetanus was assessed by using Ablett's classification [10]. Each patient was monitored clinically, routine investigations such as hieogram, sugar, urea, creatinine, Na+K+, ECG, chest X-ray, Oxygen saturation were done during hospital stay, according to need. Evidences of autonomic nervous system involvement were assessed by recording pulse, blood pressure, sweating, oro-tracheal secretion, high urinary output, ECG changes. Socioeconomic status was determined by the cards issued by the Government to the respondents. (The patients were divided into two groups above or below poverty line— APL, BPL). Informed consent of patients and patient parties were taken. Permission from Ethical committee from the institution was taken.

Results:

Our study consists of 134 tetanus patients admitted during one year period of which 5 cases were neonatal tetanus, 79 case were male and 55 females (ratio 1.43:1) Most of the cases were admitted in the month of January, April, July (10.44% each), 109 patients (81.34%) were of rural area and 25(18.65%) were of urban area (ratio 4.36:1). Socio-economically above poverty line were 36 (26.86%) patients and below poverty line 98 (73.13%) patients. Out of 134 patients 87 (64.92%) were Hindu and 47 (35.07%) were Muslim, Commonly affected age group were 0-10 years

(n=32, 23.80%) and above 60 years (n=26, 19.40%) [Table1]. Site of entry was commonly puncture wound and lower limb 70 (52.53%), followed by upper limb 28 (20.39%), head and Neck 4(2.9%). Ear infection were was responsible in 16 cases (11.94%), mostly in children and no wound was found. Trismus (n=128, 95.52%) was the commonest presentation followed by rigidity (n=120, 89.55%), muscle spasm and dysphagia (n=103, 76.86%). Mean incubation period among survived patients was 11.25 days and among dead patients 8.05 days. Mean onset time among dead patients were 16.2 hours and among survived patients 46 hours. Duration of spasm was 8 days in Grade II, 15 days in Grade III, 17 days in Grade IV survived patients. Average time between onset of symptoms and specific treatment was 36 hrs. Number of total patients according, to severity were Grade I: 10 (7.46%), grade II 35 (26.11%), Grade III 11/59 (44.02%), Grade IV 30 (22.38%) [Table 2] and among death cases were Grade II: 2 (5.7%), Grade III 9 (15.25%) Grade IV-28 (93.33%). Average hospital stay among death patients were 2.5 days and among survived patients 18.52 days. Total death cases were 39 (29.10% of total admission) of which 27 were males and 11 were females .Age group related admissions and deaths are shown in table I. Common complications were tachycardia 40 (29.85%), hypertension 30 (22.30%) aspiration pneumonia 18 (13.43%), respiratory failure 11 (8.20%) arrhythmia 10 (7.46%), ischemia 9 (6.71%), laryngo-spasm 6 (4.47%), sepsis 6 (4.47%) sudden cardiac death 3 (2.23%), renal failure 2 (1.49%) [Table-3] Immunization was completed in 15 (11.19%), incomplete in 101 (75.37%) cases. 18 cases (13.43%) were never immunized. No one was protected with immune-globulins. Awareness about need of immunization and wound care was estimated among 10 family members or relatives of each patient (n=1340) during treatment period and revealed that 62.23% (n=834) knew the need of active immunization but they were reluctant about it. No one heard about passive immunization (use of immunoglobulin). Each patient and participants were educated about the care of wound and need of immunization. At follow up after 3months level of

awareness improved to 100% for wound care, active and passive immunization, among communicated people (n=1138) involved in this study.

Table 1: Age related admissions and deaths

Age Group (yrs.)	Total no. of Patients Admitted (n%)	No. of Patients Survived (n%)	No. of Patients Died (n %)
0 – 10	32(23.88)	25 (26.31)	07 (17.94)
11 – 20	25 (18.65)	20 (21.05)	05 (12.82)
21– 30	8 (5.97)	6 (6.31)	02 (5.12)
31 – 40	17 (12.68)	14 (14.73)	03 (7.69)
41 – 50	11 (8.20)	6 (6.31)	05 (12.82)
51 – 60	15 (11.19)	9 (9.47)	06 (15.38)
60 - above	26 (19.40)	15 (15.78)	11(28.20)
Total	134	95	39

Table 2 : Pattern of out-come of tetanus

Grade	Number	Fatality (%)
Gr. – I	10	0 (0.0%)
Gr. – II	35	2 (5.71%)
Gr. – III	59	9 (15.25%)
Gr. – IV	30	28 (93.33%)

Table 3: Complications and outcome among tetanus patients

Complications	Number of Patients (n%)	Fatality (n %)
Aspiration Pneumonia	18 (13.43)	9 (50.0%)
Laryngo-spasm	6 (4.47)	6 (100)
Tachycardia	40 (29.85)	0 (0.0%)
Hypertension	30 (22.38)	0 (0.0%)
Myocardial Ischemia	9 (6.71)	1 (11.11)
Arrhythmia	10 (7.46)	2 (2.0%)
Renal Failure	2 (1.49)	1 (50.0%)
Myocarditis	4 (2.98)	2 (50.0%)
Respiratory failure	11 (8.20)	11(100.0)
Sudden cardiac death	3 (2.33)	3(100.0%)
Sepsis	6(4.47)	4 (66.66)

Discussion:

Tetanus is an important disease affecting people of developing countries, which is preventable. It reflects the immunization status, knowledge of the people about wound care, active and passive immunization. In the year 2006 at ID & BG Hospital Kolkata, total admissions of tetanus patients were 225 of which 15 cases were of neonatal tetanus and total death cases were 66 (29.33%) of which 7 cases (46.66% of NT) were neonatal tetanus. In this study in 2011, total tetanus cases were 134, of which 5 cases were neonatal tetanus and total deaths were 39 (29.10%) of which 1 was of neonatal tetanus (20% of NT). This reflects the improvement of the scenario but further emphasis is required. The incubation period of tetanus varies from few days to few weeks but commonly 6 to 12 days and it depends on distance of primary wound infection and central nervous system, the inoculating dosage of bacteria and the immune status of the host. [12] Males are affected more than females, puncture wound of lower extremities are more common. Trismus, rigidity and dysphagia are common presentations. In one study by Komolote et al among 79 adult patients revealed M:F = 2.4:1.45, puncture wound of lower limbs were 67%, 57% were below 30 years of age, mild tetanus -25%, moderate tetanus-20%, severe tetanus-55%, with mortality of 45% [13]. Todesse et al studied 29 cases where M:F=1:9:1, majority of rural origin, mean age were 35+14 year, lower limb injury were 72. 4%: mild, moderate and severe cases were 13.8%, 37.9%, 48.3% respectively. Trismus (100%) was the commonest clinical manifestation, followed by stiffness of back (93.1%), neck (86.2%) with 41.4% mortality [14]. Orellana-San-Martun-C et al found in their study that incubation period varies from 3 days to 4 weeks, with route of entry in upper limb (42%) more than lower limb (34.6%), trismus was the commonest clinical presentation (88%) followed by dysphagia (77%), cervical rigidity (69%) only 3 out of 26 patients were vaccinated. Mortality was 69% and common complications were dysautonomia (73%), pneumonia (42%) [15] Petermans et al. Studied 27 patients where no injury was found in 3 cases, mortality was 11. 11% and mean hospital

stay was 25.7 days [16]. In one study in Pakistan among NT cases fatality rate was decreased in 2010 (30.1%) than 1993 (42.6%) [11].

If the incubation period and onset of spasm is shorter disease would be severe. Autonomic involvement is common and sympathetic nervous system is mostly affected resulting in tachycardia, hypertension, arrhythmia, pyrexia, even sudden cardiac death. Autonomic involvement starts few days after spasm and may persist for 1 to 2 weeks. Sometimes plasma catecholamine levels may increase up to 10 folds. In absence of I.T.U and ventilator facilities, 50% deaths may occur due to airway obstruction or respiratory failure [17]. Common complications noticed in tetanus are aspiration, laryngo- spasm, tachycardia, hypertension, ischemia, oliguria, renal failure [18].

In our study-males are more affected (M; F=1:43:1) and disease is more prevalent among BPL members. Trismus (95.52%) was the commonest presentation; mortality was 29.10%, average hospital stay among survived patients was 18.52 days. Common complications were tachycardia (29.85%) hypertension (22.38%) pneumonia (13.43%). In a study by Anuradha et al mortality due to tetanus increased with age more than 60 years, shorter duration of symptoms, shorter duration period of onset and severe disease at presentation [19]. In a Taiwan study among 23 adult patients number of male and female patients were 12 (52%) and 11 (48%) respectively. Average age was 57years (± 18), average incubation period was 8 ± 5 days, 78% was with acute injury, most common clinical feature was trismus (78%), 13 of which (57%) developed respiratory failure and needed ventilator support and pneumonia was commonest complication [20]. There is no biological, reason for male preponderance but males are at more risk at exposure to injury and infection due to their occupations. India was in 50 to 79% DPT3 vaccine coverage in 2010. Several studies showed that most of the tetanus patients missed the chance to receive prophylaxis. In our study no one received immunoglobulin, only 11.19% patients completed immunization schedule, 75.37% not completed and 13.43% never received vaccine. Knowledge to take tetanus vaccine among family members and

relatives are 62.23% but they have casual attitude. No one was aware of immunoglobulin. In awareness study of tetanus in Pakistan only 761, was found who received tetanus toxoid after an injury [21]. In Indian study among general people only 38.5% know the need of tetanus immunization after injury [22].

Conclusion:

We all are every time exposed to the risk of tetanus. It is a preventable disease and proper health education, wound care, Immunization, early diagnosis and treatment can halt the incidence and mortality of the disease.

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References:

1. Gerding DN, Johnson S. Clostridial infections. In: Goldman L, Schafer AI, eds. *Goldman's Cecil Medicine*. 24th ed. Philadelphia, PA: Elsevier Saunders; 2011:chap 304.
2. Reddy P, Bleck TP. *Clostridium tetani* (Tetanus). In: Mandell GL, Bennett JE, Dolan R, eds. *Mandell, Douglas, and Bennett's Principles and Practice of Infectious Diseases*. 7th ed. Philadelphia, PA: Elsevier Saunders; 2009: chap 244.
3. Cvetanovic, B et al. Bull WHO, Supplement no I, 1978; Vol. 56: 28-29.
4. American Academy of Pediatrics (2009). Tetanus (lockjaw). In LK Pickering et al., eds., Red Book: 2009 Report of the Committee on Infectious Diseases, 28th ed., pp. 655–660. Elk Grove Village, IL: American Academy of Pediatrics
5. Centers for Disease Control and Prevention (2011). Tetanus. In W Atkinson et al., eds., *Epidemiology and Prevention of Vaccine-Preventable Diseases*, 12th ed., pp. 291–300. Washington, DC: Public Health Foundation
6. Reddy P, Bleck TP (2010). *Clostridium tetani* (tetanus). In GL Mandell et al., eds., *Mandell, Douglas, and Bennett's Principles and Practice of Infectious Diseases*, 7th ed., vol. 2, pp. 3091–3096. Philadelphia: Churchill Livingstone Elsevier.
7. Centers for Disease Control and Prevention. Advisory Committee on Immunization Practices (ACIP) Recommended Immunization Schedules for Persons Aged 0 Through 18 Years and Adults Aged 19 Years and Older. United States, 2013. *MMWR*. 2013;62(Suppl 1):1-19.

8. WHO (2010) weekly Epidemiological Record 2nd July, 2010; 27: pp 17-19
9. Park K., Park's Textbook of Preventive and social Medicine. 21st Edition, 2011 M/s Banarsidas Publishers, India. pp 284-288,
10. Ablett JLL. Analysis and main experiences in 82 patients treated in the Leeds Tetanus Unit. In: Ellis M, editor. Symposium on tetanus in Great Britain. Boston Spa, UK: Leeds General Infirmary; 1967. p. 1-10.
11. Lambo JA, Memon MI, Khahro ZH, Lashari MI. Epidemiology of Neonatal Tetanus in Rural Pakistan. *J. Pak. Med. Assoc* 2011; 61(11), 1099-103.
12. Parija C. Textbook of Microbiology and Immunology, ELSEVIER. 2009: 247
13. Komolafe MA, Komolafe EO, Oqundere AO. Pattern and outcome of adult tetanus in Ile-Ife, Nigeria, *Niger J. Clinical. Practice*. Dec 2007; 10 (4): 300-3.
14. Tadessa A, Gebre-Selassie S. Five year review of cases of adult tetanus management at Gondar University Hospital, North West Ethiopia (Gondar, Sept. 2003-Aug 2008). *Ethiop Med. J.* Oct 2009; 47(4):291-7.
15. Orellana-San M C, Su H, Bustamante-Durán D, Velásquez-Pagoaga L. Tetanus in intensive care units. *Rev Neurol*. 2003;36(4):327-30.
16. Peetermans WE, Schepens D. Tetanus-still a topic of present interest: a report of 27 cases from a Belgian referral hospital. *J Intern Med*. Mar. 1996; 239 (3) 249-252.
17. Towey R. Tetanus: Update in Anesthesia 2005; 19(17), 23-24.
18. Cook TM, Protheroe RT, Handel JM. Tetanus: a review of literature, *Br. J. Anesthesia* 2001; 87: 477-87
19. Anuradha S. Tetanus in adults - a continuing problem : an analysis of 217 patients over 3 years from Delhi, India, with special emphasis on predictors of mortality, *Med. J. Malaysia*. 2006; 61: 7 - 14.
20. Weng WC, Huang WY, Peng TI, Chien YY Chang Kit, Rols, Lvurk, Wucl, J Foronos, *Med Assoc*. 2011; 110 (11): 705-10.
21. Taneja DK, Kumar R, Dabas P, Ingle GK. Knowledge regarding tetanus toxoid immunization among persons attending health mela in Delhi. *J Commun. Dis*. 2003; 35(4): 256-62.
22. Dabas P, Agarwal CM, Kumar R, Taneja D K, Ingle G K, Saha R. Knowledge of General Public and Health Professionals about Tetanus Immunization Indian J Pediatrics 2005; 72 (12): 1035-38.

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