

Review Article

DISSEMINATION OF REALITIES: NEED FOR DISPELLING THE MYTHS OF TETANUS

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ABSTRACT

Although the incidence of tetanus cases have decreased remarkably during last century, the authors have tried to analyze the WHO reports, government publication and other authentic sources, as derived mostly from Google Search Engine (with its inherent limitations of information availability, completeness and updating status) for finding out the prevailing root causes of myths and misconceptions related to tetanus. This study highlights only salient points of concern and underlines the need for qualitative epidemiological research for the benefit of public health planners, field level public health care functionaries, private health care providers and beneficiaries.

Keywords: carpo-pedal; monovalent; neonatal; neurological; hypocalcaemia; otogenic; tetany

INTRODUCTION

Tetanus is an acute neurological disease of the active age (5-40 years) caused by bacillus *Clostridium tetani*. Its occurrence depends upon man's physical & ecological surroundings - the soil, agriculture, animal husbandry - and not on the presence or absence of infection in the population. The environmental factors are compounded by social factors such as unhygienic customs & habits, unhygienic delivery practices, ignorance of infection & lack of primary health care services. The indiscriminate contamination of soil with animal excreta is the leading cause, which makes this disease common among agriculturalists. The neonatal tetanus is the most serious form of this disease with almost 100% fatality could be easily prevented by maternal vaccination against tetanus and by maintaining basic hygienic practices. The universal immunization is a rule for it as herd immunity is unknown phenomenon for tetanus. The year 2009 was a target year for elimination of neonatal tetanus in India. The two pre-conditions required for Neonatal Tetanus (NT) elimination are very simple, first is more than 90 % coverage for 2 doses of tetanus toxoid in ANC mother, and second is attending > 75% of deliveries with 5-C's (clean

hand, clean surface, clean cord-care, clean blade & clean tie during child birth) by trained personnel¹. The operational research has shown that training of birth attendants alone can reduce death due to NT by 90%². Tetanus is a disease surrounded with many myths and misconceptions and people are generally fearful and phobic about it.

The elimination of neonatal tetanus calls for a full commitment by governments and by other bodies, public and private, with a responsibility for the care of women and children. The occurrence of even a single case of neonatal tetanus is witness to failures in the health system, for prevention is possible through the actions of trained health staff in contact with the mother³.

MATERIALS & METHODS

An exhaustive review of available literature, mostly through search by Google search engine while using varied combination of key words 'Tetanus', 'Myths & Misconceptions', 'Recent Advances' and 'Injury Management', was done. In addition, updated information was also obtained from literature available in the medical college library through study of the published articles in reputed journals during last 2 years by study of

current global scenario, health challenges in India, present policy initiatives and impact assessment reports of national health programs. These consolidated findings were also studied across spectrum of epidemiological triad along with the reach and quality of present health care scenario in India as well as within the apparent limitations of this study including the naturally left over space for the policy planning and development of systematic universal health care mechanisms to avoid the tetanus cases in the community.

RESULTS & DISCUSSION

The exhaustive study of the myths and misconceptions related to the Tetanus are detailed herewith, for completeness of understanding, observed situations & scenarios, required necessary steps and better scientific treatment cum care related health services, as follows:

1 The myth 'Tetanus is a very common communicable disease' needs dissemination of the truthful information especially among the beneficiaries. Though rare in developed countries, due to mechanization of agriculture, it is comparatively uncommon in developing countries also. The commonest type of tetanus we encounter is Neonatal Tetanus (NT), known as 8th day disease in Punjab has mortality as high as 85%. During 2002, the total number of deaths caused by tetanus worldwide was estimated at 2,13,000; of which NT was estimated to be 1,80,000 & maternal tetanus about 15000-30000. During 2008, a total of 16,628 cases of tetanus (other than NT) & 6,658 cases of neonatal tetanus were reported to WHO worldwide⁴. In India, about 889 cases of NT were reported in the year 2009; however, the true NT burden in India is likely to be substantially higher than reported number indicated⁵. Reported tetanus cases have decline >95%, and deaths from tetanus have declined >99% in the United States since 1947, when the disease became reportable nationally⁶. Till date, NT has been eliminated (i.e. less than 1 case per 1000 live birth for each health block) from 15 States/UTs including Maharashtra. Even in 2009, Maharashtra reported 449 total cases for tetanus (including NT) with only 1 death⁷. The total number of cases of NT for a district is considered to be two times the number of reported male cases¹. But in India it is one of an important endemic infection in medically underserved areas and livestock raising regions. Even with treatment, the case fatality rate for NT can be as high as 80-90%. It is a killer disease, second only to measles among the six target diseases of the Expanded Programme on Immunization (EPI). It tends to occur in areas with poor access to health care, hence it often remains hidden and hence under-reported within the community⁸. With increasing

anti-tetanus immunization coverage up to 80%, now it is a rare disease in India also. The WHO has resolved to eliminate NT and new target date set for elimination is by the year 2005⁹. Another interesting fact of Tetanus is that it is not transmitted from person to person and hence is totally non communicable. The clostridium bacilli which are responsible for causing tetanus are frequently in human intestine without causing any ill effects. In the developed countries, urbanization, industrialization and mechanization of agriculture have interfered with the normal process of distribution of Clostridium tetani and have reduced the morbidity rate, as has occurred, for example in U.K., U.S.A. and Germany during the last 40 years. Kirtisudha Mishra et al have found that unlike previously published reports, otogenic route is the most common mode of PNT infection in this study. Improving immunization, increasing deliveries by skilled birth attendants and prompt treatment of suppurative otitis media are the main areas in which public health initiatives need to be focused.¹⁰

2 The myth 'Tetany is a pre-condition to Tetanus' does not need much clarification since Tetany is not tetanus and is common morbidity characterized by contraction of distal muscles of the hand and feet (carpo-pedal spasm) and is associated with tingling around mouth and limbs. It is a common manifestation of hypocalcaemia or respiratory hyperventilation leading to alkalosis. It could be managed easily with calcium supplementation and plenty of ORS at home.

3. The general belief that 'Tetanus results only after metal injuries' is untrue since tetanus has nothing to do with metals. Its occurrence depends on the presence or absence of infection in the population⁸. It is caused by Clostridium tetani, which are motile, gram positive, anaerobic rods with drumstick appearance. These organisms are found abundantly in soil, animal or human faeces. Tetanus toxin, known as tetanospasmin is only released by vegetative propagation. Hence, anyone exposed to any form of soil through any injury is at risk for tetanus. For example, farmers or gardeners working with wet soil /animal manure are at high risk with even small skin abrasion or laceration. In Punjab, application of cow dung over the umbilical stump of neonate is common culture resulting in 7th day disease (NT) even in absence of any metal injuries. It is more common in elderly population with lower immunity against tetanus. This disease is also common when it complicates chronic skin ulcers abscesses, gangrene or common middle ear infection with suppuration (Chronic Suppurative Otitis Media - CSOM) or even after burn injury. Another common type is puerperal tetanus, seen

among females exposed to unhygienic non-aseptic environment during abortion or child birth.

4. Some people may infer that the Tetanus is a generalized disease. But, though tetanus is commonly seen as a generalized disease, local form in which manifestation are restricted to muscles near the wound is also known. Cephalic tetanus, a rare form of local tetanus can follow head injury or ear infection, has high mortality. Orogenic Tetanus in a paediatric health problem commonly caused after introduction of foreign bodies in external ear. deSouza CE et al have observed that Tetanus resulting from otitis media is not an indication for surgery.¹¹

5. The carefully and comprehensively laid out schedule for Tetanus vaccination itself shows that the Tetanus is not needed every six months and the general belief that one vaccine every six months would suffice is far away from the accepted scientific norms. Tetanus vaccination should be aimed to ensure protective level of antitoxin approximately 0.01 IU/ml of serum throughout life. The monovalent purified tetanus toxoid (adsorbed) has largely supplanted plain toxoid because it stimulates a higher and longer lasting immunity response than plain toxoid. Tetanus vaccination schedule is simple to follow. As per UNICEF, one needed only two primary doses 4-6 weeks apart followed by one booster dose after a year and 2nd booster after every three to five years¹². If anyone is immunized as per this schedule, then one needs a single dose every 10 years i.e. person need at the most 10 doses for protective immunity lasting for 90 years once he is immunized as per above universal vaccination schedule. As such too much doses of tetanus toxoid are unwarranted anyway. Even the expectant mothers as per EPI recommendation are given only two doses , six weeks apart as full vaccination & those who are pregnant again before three years need only single booster dose. But the patients who have recovered from tetanus must be actively immunized, because the amount of toxin responsible for disease in man do not stimulate sufficient protective immunity. Even the babies born to fully immunized mother get passive immunity lasting for less than 6 week and hence needs vaccination against tetanus at the age of 6 weeks only. The infants born to the mothers who have not previously received 2 doses of tetanus toxoid can be protected by injection of antitoxin administered within 6 hours of birth⁸. T. Mondal et al have recommended that primary immunization with booster dose in the community is to be stressed. Children with aural discharge should be taken as a high-risk group for tetanus and be evaluated for immunization at first visit.¹³

6. Although Anti Tetanus Serum requires testing and close observation of the recipient for any reactions, the myth that 'tetanus vaccination is given after doing sensitivity test only' is baseless and doesn't require any scientific enquiry in view of the commonly practiced tetanus vaccination without any adverse reactions. Even the babies born to fully immunized mother gets passive immunity lasting for less than 6 weeks and hence needs vaccination against tetanus at the age of 6 weeks only. Tetanus vaccine which is routinely given is toxoid and need no sensitivity test. The only side effect of this vaccine is local swelling and pain due to its absorbent nature, which is minimal if given deep intramuscularly in gluteal region, else mild fomentation over injected site is also useful. This toxoid vaccine can safely be combined with multiple other vaccines like Diphtheria, Pertussis, Hepatitis and Hemophilus conjugate. The passive antibodies administration needs sensitivity testing before its use, if one is using them from equine origin, else antitetanus serum (ATS) of human origin can be used safely without any testing. However, as tetanus vaccine is adsorbed on Aluminium Phosphate, usual precautions should be observed in the person(s) giving history of allergy. When ATS is given, adrenaline solution 1 in 1000 for IM injection must be kept available in case of a generalized anaphylactic reaction.

7. The deep seated belief in the minds of people that one should be vaccinated with Tetanus vaccine every time one gets injured is not as per accepted schedule and hence may pose risk of hyper-immunization. Though tetanus toxoid is needed after any roadside injury, other modalities of treatment are also equally important. Proper wound-care is vital. All wounds must be thoroughly cleaned after injury. The removal of foreign bodies, soil, dust, necrotic tissue is required. This procedure will abolish anaerobic conditions, which favor germination of tetanus spores. One may also need early dose (< 6 hour) of suitable antibiotics like single dose of 1.2 megaunits of benzathine penicillin to take care of vegetative form of tetanus bacteria, which are the source of powerful exotoxin (Tetanospasmin), the lethal dose of which for a man of 70Kg is about 0.1 mg only. This astounding lethal toxicity of tetanospasmin is exceeded only by botulinum toxin. Its principal action is to block inhibition of spinal reflexes but it also affects the sympathetic system. Lau LG et al observed in a 10 year retrospective study that eighteen patients (81.8%) had a reasonably identifiable injury prior to the onset; all had their wounds debrided and Body stiffness, trismus and dysphagia were the three commonest presenting complaints.¹⁴

8. The practices for cold chain maintenance for Tetanus vaccine doesn't require any freezing of the vaccine and hence the belief that Tetanus vaccine can be frozen during its storage doesn't hold true in the light of global scientific practices. Tetanus vaccine or any other combined vaccine containing tetanus toxoid should never be frozen during its storage, transportation, and its administration. Even direct contact with ice should be avoided as it impairs its potency and its utility. It should be stored between 4 and 10⁰ C.

CONCLUSION

The possession of a very simplified and easily observable course of tetanus toxoid immunization needs emphasis on all fronts of public health practices and medical education to ensure minimal cases, if any, of neonatal tetanus and tetanus among adults especially the pregnant mothers. It can be achieved through training of health care workers, public awareness and motivational efforts towards availing primary health care facilities for observation of routine immunization practices, injury management and care of new born. Myths and misconceptions about tetanus are common among general population. They are common even among medical practitioners, particularly those belonging to alternative system of medicine (AYUSH). Hence, these are needed to be addressed sincerely for reaching the goal of tetanus free nation before year 2025. It will be possible only by involvement of the policy makers, programme planners, field level health workers, inter-sectoral co-ordination and people's participation, which requires careful consideration for dispelling the myths through active information drives using mass media, interpersonal communication and public health strategic efforts.

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