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Tetanus in an unvaccinated child: A case report

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ABSTRACT

In Iran tetanus is a rare disease since routine vaccination with Diphtheria, Pertussis, Tetanus (DPT) in accordance with the WHO immunization recommendations. We report on the case of an Afghan 14-year-old boy admitted to the Imam Khomeini Hospital with tetanus presenting with muscle and neck spasms pointing out to the small number of reported cases that are mainly due to failure of Iran's immunization programs among immigrant laborers. Therefore, each patient of tetanus may be considered as a failure of health care system to provide adequate immunization.

1. Introduction

According to the last data by WHO, annually 2–3 million death averted because of vaccination but even in 2008 we had 1.7 million of children under 5 years died from vaccine-preventable diseases[1]. Tetanus is more common in developing countries with 80% of deaths occurring in Africa and south East Asia where tetanus is endemic[2]. It caused by infection with the spore forming gram positive organism *Clostridium tetani*[3]. Diagnosis is based on history and clinical features. The clinical presentation of non-neonatal tetanus includes trismus, risus sardonius, neck retraction, dysphasia, spasms, hyper salivation and muscle rigidity[4].

In Iran 244 consecutive cases of tetanus were found between 1978–1997. The youngest was a 2-day-old boy and the oldest was an 80-year-old man. There were 176 males and 68 females with a male-to-female ratio of 2.5: 1[5]. Iran has started routine immunization since 1992. In 2004, routine immunization coverage was reported to be as high as 99% for diphtheria, pertussis, tetanus (DPT). Effective vaccination strategies are vital in the prevention of this serious disease[5].

Tetanus spores are found in high concentration in the soils of rural areas, especially where farm animals have

grazed. Populations most at risk in Iran include under- or non-immunized elderly and immigrant populations. Limited immunization occurs when the physician misses the opportunity to immunize his/her patients or when the patient is concerned over vaccine side effects[5].

In this report we presented a 14-year-old Afghan boy with no history of immunization who was admitted to Imam Khomeini Hospital with a history and physical exam consistent with tetanus.

2. Case report

A 14-year-old boy presented to Imam Khomeini Hospital with a 10 day history of foot injury. He was born in Afghanistan and his family had moved to Iran 10 years ago. He had not any immunization (diphtheria, tetanus, oral polio and *Haemophilus influenza* B). In addition, all of them had missed during their childhood immunizations. Foot injury was made by peg during his walks.

In physical examination and clinical investigation, blood pressure was 128/82 mmHg and respiratory rate was 20 per minute. There was no infection in the wound area. The patient had spasms in muscles associated with neck retraction and he started noticing jaw discomfort and inability to open his mouth completely. He became more sensitive to light and sounds and had more spasms. Lung and heart exam were normal.

Lab data were normal. White blood count was 9030/ μ L,

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neutrophile 50.3%, lymphocyte 36.5%, hemoglobin: 15/7 g/dL, platelet 261 000/ μ L, erythrocyte sedimentation rate 12 mm/h, C-reactive protein 5 mg/dL, human immunodeficiency virus (HIV) Ab, hepatitis C virus (HCV) Ab and hepatitis B surface antigen (HBS Ag) were negative.

For emergency treatment to control spasms we injected 10 mg diazepam and after that we injected 500 mg metronidazol IV and one dose of human anti tetanus immunoglobulin. In order to better respiratory care, our patient were referred to ICU for quiet and dark environment. In the ICU because of increased severity of spasms he was treated by midazolam and intubation was done. In ICU he received a 5 000 unit of heparin, 50 mg of pethedin, 10 mg of midazolam, 25 mg of baclofen, 1.4 mg tizanid, 15 mg ranitidine, and 5 g of nystatin drop. At the first week in ICU he got tracheostomy with prescribed seven days metronidazol and vecuronium. After 2 weeks in ICU, the patient received midazolam. At last after 1 month drug treatment and care and lying in water bed, the patient received 3 dose of human anti tetanus immunoglobulin and the patient recovered and was discharged.

3. Discussion

Tetanus is uncommon in Iran. Because of immunization, according to the last statistic tetanus is a rare disease in children. Most of tetanus patients in our country are older adults and intravenous drug users (IDUs). Lack of routine medical care and immunization contribute to low levels of immunity. A high index of suspicion is crucial for the correct and early diagnosis. Therapeutic effectiveness is higher if we start etiopathogenetic therapy than if we only treat symptomatically^[6].

There are four clinical forms of tetanus representing the extent and location of neurons involved: generalized, local, cephalic, and neonatal. In developed countries, generalized tetanus is the most common form, occurring in 80% of cases as in our case^[6]. The initial symptom is trismus “lock jaw” most of patients report sore throat with dysphasia as early sign—secondary to masseter muscle spasm in 50–75% of cases. As the disease progress, generalized muscle spasms occur, either spontaneously or to minor stimuli such as touch or noise like in our case get stimulate with noise. Opisthotonus is described with tetanus, a tonic contraction very similar to decorticate posturing^[6,7].

With intensive medical intervention, including the use of paralysis and mechanical ventilation, such deaths can be decreased. Patients surviving after the acute phase, autonomic instability are the major cause of death^[6,7]. Local tetanus presents as persistent muscle rigidity close to the location of injury. The rigidity may stay for weeks to months and often resolves without sequell^[4]. Our case had the muscle rigidity longer for 2 weeks and we controlled it by diazepam.

We can diagnose tetanus by clinical grounds alone. There are no laboratory tests that can diagnose or rule-out tetanus. A protective serum antitoxin antibody level, commonly

accepted as 0.01 U/mL (*in vivo*) or 0.15 U/mL (*in vitro*), makes the diagnosis of tetanus very unlikely, but not impossible^[3].

Treatment involves neutralizing tetanospasmin, removing the source of the toxin, autonomic instability and providing supportive care for muscle spasms. Human tetanus immunoglobulin (HTIG) is given to neutralize circulating tetanospasmin within neurons half-life is 25 days; only a single dose is necessary. To prevent on-going production of toxin, antibiotics are given to eliminate *Clostridium tetani*. Metronidazole is a choice for the treatment. This drug penetrates vascularly compromised wounds and abscesses better than does penicillin. Because of Gamma aminobutyric acid (GABA) –antagonist activity in penicilin, it may potentiate the effects of tetanospasmin. Benzodiazepines are the drug of choice for muscle spasms^[3,6]. In our case we use more than 100 mg of diazepam given over 24 hours.

Vecuronium, because of its minimal cardiovascular effects, is an ideal agent for immediate and long-term control. According to WHO standard treatment guidelines and essential drugs list in standard therapy drugs used to treat muscle spasm, rigidity, and tetanic seizures include sedative–hypnotic agents, general anesthetics, centrally acting muscle relaxants, and neuromuscular blocking agents. Antitoxins are used to neutralize any toxin that has not reached the CNS^[6].

Our case was treated according to the above standard therapy and recovered after one month.

Conflict of interest statement

We declare that we have no conflict of interest.

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