

Do you think I need a Tetanus shot?

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It's a beautiful day at the lake and we are taking a break after lunch before returning to the swimming, tubing and skiing. It's a perfect time to do a little bluegill fishing with the kids. Hooks are baited and each child is given an assigned spot on the boat. I turn my back to get a coke when I hear the cry, not the whiny cry of two siblings irritating each other but instead a cry that only come with intense pain. Without even looking

everyone in the boat knows what has happened. Someone just got hooked.

This is hardly an incident that needs an ambulance but if we only responded to calls that "needed" an ambulance then we would run a lot less calls. Routinely we respond to calls that are initiated by the sight of blood or by the thought of the worse case scenario but are suddenly made minor by a little water, some 4x4's and a calm confident paramedic who tells them there all right. These situations often end in a refusal. Our protocol instructs us to tell the patient that infections can occur and the injury could get worse then we have sign the form. One question always seems to come up. Do you think I need a tetanus shot?



Our objective in this article will be to.

- Learn what tetanus is.
- Understand how tetanus infects the body.
- Understand how the body reacts to tetanus.
- Learn what role EMS has in the prevention of tetanus.

What is tetanus?



Tetanus is caused by a bacterium that is always present in our environment. The bacterium produces spores that live in soil, house dust and in the digestive track and feces of animals including humans. The spores are resistant to heat and disinfectant. In 73% of cases the spores have entered the body after an injury. In 50% of cases that injury has been a puncture, 33% a laceration and 9% an abrasion. The spores can enter the body in other ways as well. Dental infections, tooth extractions and root canals account for most of the cases not related to an injury as well as surgeries that have taken place in hospitals. The bacteria releases spores and these spores germinate into tetanospasmin. Once the tetanospasmin has been released it is distributed throughout the body by the lymphatic and circulatory systems. The tetanospasmin attaches to the ends of the nerves and moves through the nervous system until it reaches the central nervous system (CNS).



Tetanospasmin interrupts the release of neurotransmitters that prevent motor reflex response to sensory stimulation. The result is the over sensitivity and over contraction of muscles. This is

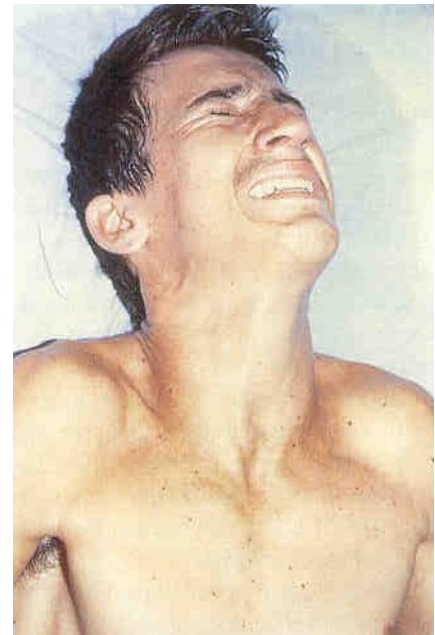
known as a titanic spasm. Nerves that are the shortest distance from the CNS are first to show symptoms. These nerves are located in the face and neck. Once the toxins are fixed to the neurons they can not be neutralized. Nerve function can be recovered but it requires the sprouting and formation of new synapses.

Assessment



Tetanus can present its self in two ways. Localized tetanus will occur near the injury site and characterized by painful muscles spasms that can occur for weeks. Generalized tetanus is the most severe form of tetanus and will be the focus of this article. In most

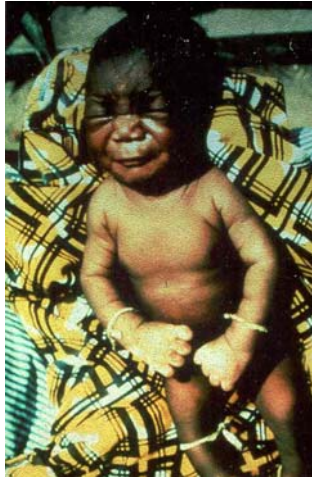
cases tetanus will present itself within 14 days with severe cases presenting in less then 7 days of exposure. In 75% of cases the first symptom is trismus, better know as lockjaw. Other symptoms that may be seen are muscle stiffness, neck rigidity, dysphagia, restlessness and reflex spasms. Muscle rigidity is the major dysfunction in the disease process and will spread to the limbs within 48 hours of the initial onset. Reflex spasms develop in most cases and can be triggered by minimal external stimulation such as noise, light or touch. The spasms can last from seconds to minutes and become more intense and more frequent as the disease process continues. The spasms can be so severe that they cause apnea, fractures and dislocations. Laryngeal spasms can occur causing death by asphyxiation. The muscle spasms may



also present as sudden burst of muscle contractions resembling a seizure however the patient will not lose consciousness and usually is in severe pain.

Not all cases of tetanus end in death. The worldwide mortality rate is 45%. Older victims are at the greatest risk with persons over 60 accounting for 40% of worldwide deaths and 75% of deaths in America.

How big is the problem?



Tetanus is an illness that is much more prevalent in underdeveloped countries especially those with warm humid climates. The World Health Organization reported 578,000 neonatal deaths in 1992 due to tetanus. In that same year 140,000 deaths were reported from non-tetanus related illnesses. It is believed that unhygienic cutting of the umbilical cord may have caused many of these cases as well as a lack of vaccination. The

World Health Organization has created special task forces responsible for immunizing children and teaching cleaner ways to cut umbilical cords and how to keep umbilical cord stumps clean until they have healed.

America has its problems as well. From 1998 to 2000 the United States reported 130 cases of tetanus to the CDC. The CDC believes that as many as 60% of cases may go

unreported. Texas and California has the highest number of reported cases with Hispanics being affected most often. The number of cases affecting Hispanics is nearly twice that of the cases affecting Whites and African-Americans. The reason for





this is obvious, many individuals coming to America from Mexico and Central America have never be immunized or have not received adequate boosters to maintain immunity.

Tetanus in America can not be labeled a disease that only affects immigrants. 50% of Americans older then 50 years old are non immune to tetanus due to not receiving the immunization or adequate boosters. Immunity decreases with advancing age leaving older Americans completely unprotected. In the case of men older then 50 years most had not received a tetanus shot since performing military service and in women of the same age many had not received one since being in grade school.

Children on the other had are well protected in America. In the 1940's children were required to have the diphtheria and tetanus toxoids plus pertussis (DTP) vaccination before starting school. Today 96% of children will receive at least 3 doses of the vaccine before beginning school. As a result 80% of persons 6-39 years old have been immunized compared to 28% of individuals greater then 70 years old.



What is the role of EMS?

In most cases patients are exposed to tetanus as a result of an injury that may be severe but in many cases are minor such as stepping on a nail which accounts for 32% of infections. EMS is

in a position to be the first to recommend a tetanus booster or vaccination. We are in contact with those at greatest risk of developing tetanus not related to accidents as well. Diabetics, IV drug users and people with chronic wounds are particularly in danger of developing tetanus even in the absence of an injury and account for 4% of cases in the United States.



Prevention of tetanus after an injury starts by appropriate cleaning of wounds. Special attention should be paid to wounds that are contaminated with soil, saliva or feces.

Farming accidents are a good example of an injury that may be contaminated by all three. Bites that break the skin regardless of weather they were caused by a human or an animal and exposure to contaminated water can cause tetanus and require a booster is the patient in under immunized.

It is recommended that children receive the tetanus vaccine at 12 months and 18 months and at age 2, 4 and 6. Tetanus vaccinations should be taken ever ten years their after unless there is an injury. A person who is injured and has not received the tetanus vaccine within 5 years should receive a booster. This is especially true of avulsions, punctures, or crushing injuries.

Tetanus may not be a large problem in America but it is still a problem especially in Texas and EMS is in a position to prevent it. While we may not give tetanus boosters in the field we can still communicate the dangers of under immunization and help people make correct decisions when they are choosing to refuse transport. At the very least we should be able to tell them if they need a tetanus shot.



Credits

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