

THE TACTICAL EDGE

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In the wake of tragedy the NTOA Memorial & Scholarship Foundation supports the families of fallen officers. To contribute see page 6.

Wilderness Operations

By Dennis Krebs

Preventing Lyme Disease In Tactical Operators

Tactical team members in rural areas are often faced with operations in wooded areas. Even in suburbia, countersnipers and their supports may find the need to don a ghillie suit and prepare a hide in tall grass or brush. Experienced personnel are well aware of the risks of such operations and conduct tick checks at their earliest convenience. However, many of our personnel are not well versed on the vectors that transmit Lyme Disease.

In recent years much has been written about Lyme. New information published in the July 12 issue of the New England Journal of Medicine may assist the tactical medic in determining a course of action when a team member reports being bitten by a tick.

Lyme Disease was first identified in 1975 following an unusual outbreak of arthritis in Lyme, Conn. Since that time a number of reports by a variety of media have caused near hysteria regarding this disease. Lyme Disease is commonly associated with the deer tick (*Ixodes scapularis*) in the Northeast and Northcentral United States. The Western black-legged tick (*Ixodes pacificus*) is responsible for transmission in the Pacific Coast region. The infection itself is caused by a corkscrew-shaped bacterium known as *Borrelia burgdorferi*. Although Lyme is now the most commonly reported vector-borne disease and has been reported in 49 states and the District of Columbia, the vast majority of cases occur in the Northeast from Maine to Maryland and in the Midwest, specifically Wisconsin and Minnesota. Between 1992 and 1998, the Centers for Disease Control reported 88,967 cases. Ninety-two percent of the infections were from the Northeastern, Mid-Atlantic and Northcentral states. Westchester County, N.Y. has one of the highest transmission rates in the world. Cases are also being reported in a small number of counties in northern California, however significantly fewer exposures than in the Northeast.

The ticks responsible for the spread of Lyme have three stages of development: larval, nymphal, and adult. Each stage of development requires a blood meal, which may take several days to complete. Infection only occurs when a person is bitten while the tick is in the nymphal stage. Information in The New England Journal of Medicine notes that for transmission of *B.burgdorferi* to occur the tick must be at least partially engorged with blood. A deer tick that is not engorged will appear flat. Should the tick be found in less than 72 hours from initial exposure there is virtually no risk of contracting the disease. Even after 72 hours the victim only has a 25 percent chance of contracting Lyme.



Team members can be exposed to vector-borne diseases on a variety of operations

Tactical Implications

Armed with this information it would appear that the hysteria over Lyme disease might be unwarranted. If your team operates in jurisdictions outside the area identified as having a high incidence of the disease, the probability of infection is very low. Whether your team operates in a rural or suburban area, when conducting wooded patrols or deploying countersnipers to grassy or brush laden areas, the team medic should ensure adequate tick checks, to include a check of clothing, at the completion of the mission. Countersnipers operating for hours from a hide in wooded or grassy areas will be at the highest risk for contracting not only Lyme Disease, but a plethora of other vector-borne diseases depending upon the locale.

Deer ticks in the nymphal stage are very small, approximately the size of a poppy seed or pinhead. Since these ticks tend to migrate to the scalp, underarms and groin, a secondary check should be conducted while showering. Due to their size physicians may have difficulty identifying deer ticks in the nymphal stage. Comprehensive mission planning should note appropriate facilities for the proper identification of deer or Western black-legged ticks infected with *B. burgdorferi*.

Preventive measures will further reduce the probability of contraction. Team members should be encouraged to blouse pants in boots. Shirts should have the sleeves rolled down with both the neck and wrist buttoned. Nomex gloves should be tucked underneath buttoned sleeves. Each of these measures will reduce the probability of arthropods and other insects finding their way inside the member's clothing. Medics should also encourage the application of insect repellent containing Permethrin to duty uniforms (do not apply directly to skin). Clothing treated with the agent will reportedly kill ticks on contact for approximately two weeks and through several washings. Insect repellents containing N, N-diethyl-M-toluamide (DEET) should be applied to exposed

skin. Note: The Environmental Protection Agency has concluded that as long as users follow label directions DEET does not present a health concern. (Additional information concerning this product is available at <http://www.epa.gov/pesticides/citizens/deet.htm> and <http://webmd.lycos.com/content/asset/uspdi>) Medics and team commanders should consult medical directors regarding the appropriateness of Lyme vaccinations for team personnel. The current vaccine, LYMERix, requires three IM doses. The second dose is delivered on month after the initial. The third is administered 12 months after the first, usually in April just prior to the infectious season. The usefulness of boosters is still being evaluated.

The normal treatment course for tick bites has been prophylactic administration of Doxycycline.

Should a team member find a tick it should be maintained for identification by a medical entomologist. The normal treatment course for tick bites has been prophylactic administration of Doxycycline. Given the most recent information outlined in Dr. Eugene D. Shapiro's editorial in The New England Journal of Medicine, unless the victim is within an area of high incidence of Lyme disease where a partially engorged deer tick (feeding for near 72 hours) in the nymphal stage has been identified, prophylactic treatment may not be necessary. Should identification not be possible, use of antimicrobials such as Doxycycline, Amoxicillin, or Cefuroxime axetil would be appropriate. It should also be noted that a single dose of this medication has been shown to be 87 percent effective in preventing Lyme.

Aware of Signs

Medics, nonetheless, should be aware of the signs and symptoms of Lyme disease. Three days to one month after the bite of an infected tick, the victim will develop a red circular patch, known as Erythema migrans, at the site of the bite. The rash may expand to a large size with the center clearing. The rash will then have the appearance of a bull's-eye. It should be noted that not all rashes at the site of a tick bite are indicative of Lyme infection. Some rashes are the result of an allergic reaction to tick saliva. These lesions will generally appear within hours or days of the bite, will not expand and develop the bull's-eye appearance, and will fade within a few days. Other early signs and symptoms of the disease include fatigue, fever and chills, headache, swollen lymph nodes, and muscle and joint pain. Additional signs and symptoms may develop months to years after exposure. These include arthritic pain and swelling in the larger joints, especially the knees. A small number of patients will develop cardiac complications within weeks of exposure. Long term, the victim may also experience nervous system abnormalities such as pain, numbness, paralysis of facial muscles (Bell's palsy), as well



Deer ticks: (from left to right) adult female, adult male, nymph, larva on centimeter scale. (Courtesy Centers for Disease Control and Prevention)

as meningitis symptoms of fever, stiff neck, and severe headache. Team members exhibiting such signs and symptoms should be referred to appropriate treatment.

There are many species of ticks throughout the United States and the world. Not all carry *B. burgdorferi* which is the only pathogenic species causing Lyme Disease found in this country. The aforementioned information is relative to the incidence of Lyme Disease in the United States. Teams conducting operations outside the continental U.S. should conduct appropriate research and mission planning for the prevalence and treatment protocols of Lyme in the target region.

About The Author

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