

# Leishmaniasis Acquired in the Iraqi Theater of Operations: Lessons Learned

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*Between August 2002 and February 2004, the Department of Defense identified 522 cases of cutaneous leishmaniasis in military personnel. This commentary examines reasons why there were so many cases of leishmaniasis during this conflict as compared with Operation Desert Storm. Lessons learned can be applied to reduce the risk to US personnel during future conflicts. Among the factors to be considered are environment, exposure, vector control, and the failure to deliver insect repellent to deployed US personnel.*

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During the period of August 2002 through February 2004, the Department of Defense (DoD) identified 522 cases of cutaneous leishmaniasis in military personnel (Figure). In 361 cases (69% of the 522 patients), demographic data were collected under treatment protocols for a pentavalent antimonial compound, and these data were reported in the MMWR.<sup>1</sup> The reported data suggest that all but 4 of the individuals were infected in Iraq, mostly in areas near the Iraq-Syria border and the Iraq-Iran border. The infected individuals were deployed with multiple branches of the US military, but most were in the Active Force component of the US Army. Most of the cases occurred during the period of August 2003 through November 2003.

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To decrease the risk for leishmaniasis among US military personnel deployed in Southwest/Central Asia, the DoD responded by stressing the importance of personal protective measures such as wearing permethrin-treated clothing, erecting barriers to sand flies, minimizing exposed skin, and applying the insect repellent DEET to exposed skin. Steps also included enhancements in vector-control activities, improvements in living conditions for deployed personnel, and predeployment and post-deployment briefings about leishmaniasis.

The response by the DoD was timely and appropriate, but questions remain. Why did so many cases of leishmaniasis occur in such a brief time? Why was leishmaniasis a greater issue during this deployment than during operations Desert Shield and Desert Storm? And the most important question: Are there any lessons that can be applied to prevent injury to US personnel during future deployments?

During operations Desert Shield and Desert Storm, the rate of infection with exotic diseases was very low, especially considering the magnitude of our presence in the region. The liberal use of insecticides and repellents was important in reducing the incidence of disease during these operations. Many of the ground troops were deployed in the open desert during cooler winter months. This was also an important factor in minimizing the number of infections. During operations Desert Shield and Desert Storm, approximately 800,000 coalition troops were deployed in Southwest Asia. There were only 31 cases of leishmaniasis among the 697,000 US troops deployed and no reports of sandfly fever among coalition forces. Even though the area of conflict was endemic for vectors of sandfly fever, West Nile fever, Rift Valley fever, and Crimean-Congo hemorrhagic fever, only leishmaniasis proved to be a significant problem, and the incidence was low.<sup>2</sup> There were 12 cases of visceral leishmaniasis due to *Leishmania tropica* related to

operations Desert Shield and Desert Storm, indicating that *L. tropica* is capable of producing systemic disease.<sup>3</sup> Overall, environmental factors, the nature of the deployment, and our preventive strategies resulted in an extremely low incidence of vector-borne disease during the first Gulf War.

During the current conflict, vector-control efforts were more complicated, as our forces remained in place during the change of seasons. Our forces also were deployed to a wider range of locations than during the earlier conflicts. There is no question that vector control is easier during a short military deployment than during a prolonged peace-keeping and rebuilding effort, as in our current deployment.

There is another factor that may have contributed to the higher incidence of leishmaniasis during the current conflict. Despite our planning and our existing military doctrine, at least some US troops were allowed to deploy without insect repellent. Troops were told that repellent would be delivered after their arrival “in theater.” In some cases, it never arrived. In other cases, the small quantities of repellent that did arrive in theater were adequate enough for only a handful of individuals among the hundreds in need. Furthermore, while units were issued protective bed netting, some were not issued the poles required to support the netting or impregnation repellent to treat the netting (personal experience of Scott Miller, MD, and oral communication with troops deployed in Southwest Asia, September 2002–April 2004).

US military doctrine acknowledges the importance of control of vector-borne disease.<sup>4,5</sup> FORSCOM Regulation 700-2, Standing Logistical Instruction, issued December 1, 1999, emphasizes the importance of preventive medicine practices: “Historically, in every conflict/deployment in which the U.S. has been involved, only 20 percent of all hospital admissions have been from combat injuries. The other 80 percent have been from DNBI [disease non-battle injury]. Excluded from these figures are the vast numbers of soldiers with



Cutaneous leishmaniasis.

decreased combat effectiveness due to DNBI not serious enough for hospital admission. Good Preventive Medicine practices are critical to protect our self's, our soldiers, and can be the difference between mission accomplishment or failure!”<sup>6</sup> The same regulation clearly states the requirement that all company, troop, and battery-sized units prestock insect repellent at home station. Despite this doctrine, we sent some US military personnel to the Gulf region without insect repellent.

A memorandum from the Office of the Chairman of the Joint Chiefs of Staff states that “Historically, DNBI cost the field commander 99% of all personnel lost from deployed forces (validated during Operation DESERT STORM) and are largely preventable.”<sup>7</sup> The memorandum directs that, effective March 1, 2002, all commands must “review infectious disease and environmental health risks for the area of operations.” It also directs that predeployment preparations include “Complete individual medical readiness processing, including the following:

- (1) Immunizations . . .
- (2) Deployment-specific medical countermeasures
  - (a) Additional immunizations (e.g., anthrax, meningococcus, Japanese Encephalitis vaccine)
  - (b) Chemoprophylactic medications (e.g., Mefloquine, Chloroquine, Doxycycline)
  - (c) Other individual personal protective measures (such as insect repellent, bed-netting, and uniform impregnation) . . .<sup>7</sup>

US Army Field Manual No. 3-100.21, Contractors on the Battlefield, defines the responsibilities of civilian contractors who provide personnel in support of US military deployments.<sup>8</sup> The individual deployment checklist for these individuals includes insect repellent among the 33 essential items. Of interest, a published “Preparation for Overseas Movement Checklist” for military personnel only lists insect repellent as a recommended personal item.<sup>9</sup> This should be corrected. Our soldiers deserve the same protection afforded civilian personnel.

In his testimony before the House Armed Services Committee Subcommittee on Total Force on March 18, 2004, Lieutenant General James Peake, the Surgeon General of the US Army, stated, “Healthy and medically protected Soldiers; a trained and equipped Medical Force that deploys with the Soldiers, providing state-of-the-art medical care; and managing the health of all Soldiers and their families back home while keeping the covenant with our retirees—this is the mission of the United States Army Medical Department (AMEDD).”<sup>10</sup> He went on to cite “the development of vaccines for diseases seldom seen in the United States [and] formulating an insect repellent that can serve as a sunscreen and camouflage paint all at the same time” as important accomplishments. General Peake concluded his opening remarks by stating, “We place a high priority on maintaining the health of Soldiers before, during, and after deployment. . . . Despite these advances in management and use of our databases, we in the Army [recognize] the need for improvement.”<sup>10</sup>

We are faced with such an opportunity for improvement. Despite our planning and existing doctrine, we allowed at least some US forces to deploy without insect repellent, even in the face of a known risk for vector-borne disease. In at least some cases, the repellent was not delivered to these

soldiers on their arrival in theater. We failed these troops. This is an opportunity to learn from the mistake and take every effort to ensure that prepositioning of repellent and deployment with the repellent is adhered to in all military planning and future deployments.

## REFERENCES

1. Centers for Disease Control and Prevention. Update: cutaneous leishmaniasis in U.S. military personnel—Southwest/Central Asia, 2002-2004. *MMWR Morb Mortal Wkly Rep.* 2004;53:264-265.
2. Cope SE, Schultz GW, Richards AL, et al. Assessment of arthropod vectors of infectious diseases in areas of U.S. troop deployment in the Persian Gulf. *Am J Trop Med Hyg.* 1996;54:49-53.
3. Hyams KC, Hanson K, Wignall FS, et al. The impact of infectious diseases on the health of U.S. troops deployed to the Persian Gulf during operations Desert Shield and Desert Storm. *Clin Infect Dis.* 1995;20:1497-1504.
4. Department of the Army. Available at: <http://www.adtdl.army.mil/cgi-bin/atdl.dll/gta/08-05-062/gta08-05-062.pdf>. Accessed June 13, 2004.
5. US Army Center for Health Promotion and Preventive Medicine. *Pre-Deployment Planning for the Military Entomologist*. Available at: [chppm-www.apgea.army.mil/ento/Deployment/PreDeployment.htm](http://chppm-www.apgea.army.mil/ento/Deployment/PreDeployment.htm). Accessed September 14, 2004.
6. Department of the Army. *FORSCOM Regulation 700-2*. Fort McPherson, Ga: Headquarters, United States Army Forces Command; December 1, 1999.
7. Department of Defense. *Updated Procedures for Deployment Health Surveillance and Readiness*. Washington, DC: Department of Defense; February 1, 2002. MCM-0006-02. Available at: [http://www.dtic.mil/cjcs\\_directives/cdata/others/mcm\\_0006-02.pdf](http://www.dtic.mil/cjcs_directives/cdata/others/mcm_0006-02.pdf). Accessed June 13, 2004.
8. Department of the Army. *Contractors on the Battlefield*. Washington, DC: Department of the Army; January 3, 2003. FM 3-100.21 (FM 100-21).
9. Department of the Army. *Preparation for Overseas Movement Checklist*. Available at: <http://www.adtdl.army.mil/cgi-bin/atdl.dll/fm/63-11/APPDFIN.htm>. Accessed June 13, 2004.
10. House Armed Services Committee. Testimony of Lieutenant General James B. Peake, Surgeon General United States Army, Before the Subcommittee on Total Force, House Armed Services Committee, United States House of Representatives. March 18, 2004. Available at: [www.house.gov/hasc/openingstatementsandpressreleases/108thcongress/04-03-18peake.html](http://www.house.gov/hasc/openingstatementsandpressreleases/108thcongress/04-03-18peake.html). Accessed June 13, 2004.