U.S. MEDICINE
THE VOICE OF FEDERAL MEDICINE

New Research Suggests Dust Could Be Critical Factor in Respiratory Disease Among Deployed Troops

Categorized in: Department of Defense (DoD), Department of Veterans Affairs (VA), March 2013, News

By Annette M. Boyle

STONY BROOK, NY - Research presented this month at the Second Annual Scientific Symposium on Lung Health after Deployment to Iraq and Afghanistan indicates that some of the lung disease seen in returning warriors may be caused by a surprising and ubiquitous agent - dust.

Maj. Michael Best, logistics officer, Combat Aviation Brigade, 4th Infantry Division, heads for shelter on Camp Taji, Iraq, in 2007, as a sandstorm blows toward him. — U.S. Army courtesy photo by HHC, CAB, 4th Inf. Div.

A team led by Richard Reeder, PhD, director, Center for Environmental Molecular Science and chair of the Department of Geosciences, Stony Brook University, compared the dust from Camp Victory, Iraq, prior to 2012, to inert dust from San Joaquin, CA, provided by the National Institute of Standards and Technology, and dust from Montana known to be heavily laden with titanium.

They found that, with particles smaller than five microns, the Iraq dust was easily respirable. If inhaled, the sharp and irregular shape could penetrate the lung, much as asbestos does. In addition, the Camp Victory dust contained trace amounts of titanium and minerals such as calcium.

Another team then compared the response of mouse lungs to the three types of dust, delivered in a solution through a tracheostomy. While all the dust produced some airway inflammation, the mice which received the Iraq dust had the greatest septate thickening and the most inflammation as well as crystals in the lung, according to lead researcher Anthony Szema, MD, assistant professor of Medicine and Surgery, Stony Brook University Medical Center.

"The crystals were polarizable," said Szema "and similar in appearance to those found by Robert Miller at Vanderbilt University in lungs of soldiers" returning from Iraq and Afghanistan. Miller's research, published in the *New England Journal of Medicine*, identified through biopsy the largest series of constrictive bronchiolitis seen in previously healthy individuals in 80 soldiers from Fort Campbell, KY, whose radiologic and other examinations showed no cause for shortness of breath and other respiratory symptoms.1

"We believe those crystals are titanium. We have found hot spots of titanium in three of the four human lungs we have examined, as well," Szema said.

First Previous Pages: 1 2 3 Next Last

Comments (0)

Change your comment display settings

Post a Comment (show)

Airborne Hazards 0

Categorized in: Department of Defense (DoD), Department of Veterans Affairs (VA), March 2013, News

The VA action plan for the new registry seems to reflect that broader mission. As announced in the Federal Register, the plan acknowledges "the need for further study of the long-term health effects of exposure to airborne hazards (such as pollution and burn pit emissions) in Iraq and Afghanistan."

The VA and Department of Defense will work together to assess the long-term health effects related to exposure to burn pit emissions, identify early markers of respiratory disease and develop new cohort studies and adapt ongoing studies such as the Millennium Cohort Study and the National Health Study for a New Generation of U.S. veterans to support burn pit exposure research and "assess potential long-term effects related to burn pit emissions in the context of other ambient exposures."

The VA notes on its website that Iraq and Afghanistan war veterans "may have been exposed to a range of environmental and chemical hazards that carried potential health risks." Among the airborne exposures listed are sand, dust and particulates, sulfur fire, burn pits, chromium and infectious diseases.

While Torres and others say they hope to see respiratory illnesses among those who deployed to Iraq and Afghanistan added to the list of presumptive service-related conditions, Sullivan said he fears that the cost associated with presumptive status may suppress research.

"Research on illnesses associated with exposures in Iraq and Afghanistan is happening in a highly volatile political mix. If you say these conditions are deployment related, that leads to a cascade of benefits that have vast financial implications," he said.

"The research needs to be separated from the political to the extent possible, so we can determine which exposures cause which illnesses, identify ways to stop exposure in the future, invest in protecting those who will be deployed and treat those who have been deployed," he added. If a critical factor is simply exposure to the dust of Southwest Asia, the medical and financial challenges of treating and protecting forces will be substantial, Sullivan pointed out.

1 King MS, Eisenberg R, Newman JH, Tolle JJ, Harrell FE, et al. Constrictive bronchiolitis in soldiers returning from Iraq and Afghanistan. N Engl J Med. 2011;365:222-230.

First Previous Pages: 1 2 3 Next Last

Comments (0)

Change your comment display settings

Post a Comment (show)

Immunologic Response

0

Categorized in: Department of Defense (DoD), Department of Veterans Affairs (VA), March 2013, News

The researchers also assessed the impact of the dust on immune function. Using a broncho-alveolo lavage, they analyzed the fluid for cytokines IL-2, IL-4, IL-6, interferon-gamma, and the anti-inflammatory IL-10. None of the dust-treated mice had elevated IL-4 levels that would have indicated a pro-allergic response. The pro-inflammatory IL-2 levels, however, were markedly elevated in the mice treated with Iraq dust, and they also had reduced IL-10 levels.

"In short, inhaling the dust in our model shows pro-inflammatory and immunosuppressant responses that lead to lung injury," Szema summarized.

That's no surprise, said Rosie Torres, cofounder of Burn Pits 360.

"Ninety-five percent of the 2,000 people on our registry suffer from respiratory illnesses," she told U.S. Medicine.

Her organization maintains a registry of more than 2,000 individuals, which has been used by researchers over the last few years to study the associations between exposures and specific illnesses.

The newly legislated VA burn-pit registry will further advance the study of those linkages, but Torres said she plans to keep the Burn Pit 360 registry up and growing for use by researchers.

"We will encourage people to register on both, once the VA has their registry up," said Torres. "We want to make sure that information is available in as close to real time as possible for researchers."

Several studies presented at this year's and previous symposia relied on data from the Burn Pits 360 registry.

While the new legislation is specific to burn pits, the medical research required to fully understand the causes of respiratory and other illnesses among deployed servicemembers will need to examine many other, less discrete, factors as well, as the Stony Brook team's studies showed.

"Burn pits were just one of the many deployment exposures service members confronted when serving in Afghanistan and Iraq. We need to gain a better understanding about other exposures as well," Daniel Sullivan, president, the Sergeant Sullivan Center, told U.S. Medicine. The Sullivan Center is a Washington-based nonprofit group that seeks to increase knowledge of post-deployment illnesses.

First Previous Pages: 1 2 3 Next Last

Comments (0)

Change your comment display settings

Post a Comment (show)