

Health problems in Persian Gulf War veterans higher due to chemical exposure

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A study by researchers at the University of California, San Diego School of Medicine shows there is increasing evidence that high rates of illness in Persian Gulf War Veterans can be explained, in part, by exposure to certain chemicals, including pesticides and nerve agents. Veterans from the 1990-91 conflict have a higher rate of chronic, multi-symptom health problems than either non-deployed personnel or those deployed elsewhere. Symptoms routinely reported by these veterans include fatigue, muscle or joint pain, memory problems, trouble sleeping, rash and breathing problems.

“This evidence suggests that exposure to this certain class of chemical may be linked to elevated risk of health problems,” said Beatrice Golomb, M.D., Ph.D., associate professor of medicine at the UC San Diego School of Medicine, whose study will be published in the early online edition of the *Proceedings of the National Academy of Sciences* the week of March 10.

“Health issues among Gulf War veterans have been a concern for nearly two decades. Now, enough studies have been conducted, and results shared, to be able to say with considerable confidence that there is a link between chemical exposure and chronic, multi-symptom health problems,” said Golomb. “Furthermore, the same chemicals affecting Gulf War veterans may be involved in similar cases of unexplained, multi-symptom health problems in the general population.”

The study synthesized evidence regarding a class of chemicals known as acetylcholinesterase inhibitors (AChEis) and organophosphates (OP), which includes nerve gas chemicals. Some military personnel were exposed to nerve gas (sarin) when demolishing Iraqi munitions. Also, the pesticides used aggressively in Gulf regions to control sand flies and other insects fall in the same category of chemicals. This includes the carbamate

pyridostigmine bromide (PB) pills originally given to service members to protect against potential nerve-agent exposure. (Note: As a result of an earlier RAND corporation report by Golomb outlining the risks of using such pills, military policy has been changed.)

The study linked exposure to each of these chemicals with the chronic, multi-symptom health problems in 25 to 33 percent of returning Gulf War veterans.

“There is evidence that genetics have something to do with how a body handles exposure to these chemicals,” said Golomb. “Some people are genetically less able to withstand these toxins and evidence shows that these individuals have higher chance of suffering the effects of exposure.” Specifically, illness is linked to lower activity of enzymes that detoxify AChEis, due to genetic variants. The enzymes known to be involved are paraoxonase (PON) for OPs, including sarin, and butyrylcholinesterase (BChE) for PB.

Among those service members given PB pills as a preventive measure, those with the mutations that reduced their ability to detoxify the pills were at significantly higher risk of illness, according to Golomb.

Previous studies have shown genetic variants of these enzymes are also associated with increased rates of some neurological diseases, such as amyotrophic lateral sclerosis (ALS) or Lou Gehrig’s disease. Golomb says this may explain the elevated levels of ALS seen in Gulf War veterans.

Some of the chemicals linked to these multi-symptom illnesses continue to be used in agriculture, and at homes and offices for pest control in the United States and around the globe. Studies not related to the Gulf War showed that agricultural workers exposed to organophosphate pesticides had 10 times the number of health

symptoms as those not exposed.

“Again, genetic variants that hamper defense against these chemicals were linked to higher risk of health problems. These findings carry important implications for current members of the armed forces as well as the general public, suggesting that exposure to these pesticides in any setting may increase risk for impaired neuropsychological function and poor health” said Golomb.

Source: University of California - San Diego

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