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Low-dose exposure to chemical warfare agent may result in long-term heart damage

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New research found that the pattern of heart dysfunction with sarin exposure in mice resembles that seen in humans. Sarin is a chemical warfare agent belonging to class of compounds called organophosphates — the basis for insecticides, herbicides and nerve agents. As an inhibitor of the nervous system enzyme acetylcholinesterase, sarin can cause convulsions, stoppage of breathing and death.

Aiming to determine the delayed cardiac effects of sarin, researchers studied mice injected with sarin — at doses too low to produce visible symptoms — 10 weeks after the exposure.

"The two-month period was used to simulate the late onset effect of sarin/nerve agents in gulf war veterans," said Mariana Morris, director of the research program. "There are suggestions that gulf war illness; in which symptoms are long-lasting, may be related to exposure to low-dose chemical warfare agents."

Cardiac damage detected in sarin-exposed mice at 10 weeks, but not earlier, included:

- Left ventricular dilation, meaning the heart's left ventricle is larger.
- Prolonged ventricular repolarization, an electrical conduction anomaly that could lead to heart rhythm abnormalities.

- Reduction in contractility, the extent of ventricular contraction and hence the amount of blood pumped from the ventricle when it contracts.

"These results have implications for the military in times of conflict and for civilian populations in cases of environmental or occupational exposure," Morris said.

Provided by American Heart Association

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