Insight

Chemical Warfare is the Least Dangerous War!

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Since it was raged in World War I (WW I), chemical warfare weapons caused the least number of casualties compared to conventional weapons. In theory, one milligram of a nerve gas kills an adult, which means that a million people could die from one kilogram of nerve gas. With mustard gas, a million people could die by 15 kilogram. Yet, according to real life statistical studies it took an average of 25 kg of mustard gas to produce one single casualty! Of all the fatal casualties in WWI, World War II (WW II) and the 1st Gulf War, only 1% was caused by chemical agents.

A chemical weapon is any weapon that uses a manufactured chemical to kill people. The first chemical weapon used effectively in battle was chlorine gas[1], which burns and destroys lung tissue. Chlorine is not an exotic chemical. Most municipal water systems use it today to kill bacteria. It is easy to manufacture from common salt. In World War I, the German army released tons of the gas to create a cloud that the wind carried toward the enemy.

Modern chemical weapons tend to focus on agents with much greater killing power, meaning that it takes a lot less of chemical to kill the same number of people[2]. Many of them use the sorts of chemicals found in insecticides. When you spray your lawn or garden with a chemical to control aphids, you are, in essence, waging a chemical war on aphids.

Today, thousands of poisonous substances are known but only a few are considered suitable for chemical warfare. About 70 different chemicals have been used or stockpiled as chemical warfare agents during the 20th century. Only a few of these are considered of interest today, owing to a number of demands that must be placed on a substance if it is to be of use as a chemical warfare agent.

- A presumptive agent must not only be highly toxic but also "suitably highly toxic" so that it is not too difficult to handle.
- The substance must be capable of being stored for long periods in containers without degradation and without corroding the packaging material.
- It must be relatively resistant to atmospheric water and oxygen, so that it does not lose effect when dispersed.
- It must also withstand the heat developed when dispersed.

Chemical agents may exist as solids, liquids or gases. To a certain extent the state in which an agent exists determines its use, duration, effectiveness, and physiological action. The physical state of an agent also contributes to a determination on munitions delivery vehicle and methods used for its dissemination.

Chemical agents are classified according to their physical state, physiological action and use. A chemical agent is termed persistent or non-persistent depending on the time it remains as a threat in a targeted area. Chemical agents maim, kill, seriously injure, or incapacitate unprotected people. These agents include nerve, blister, blood and lung-damaging agents.

Nerve agents (anticholinesterase) (such as Tabun (GA), Sarin (GB), Soman (GD), GF, and V-agent (VX)) inhibit the cholinesterase enzymes. The cholinesterase enzymes are responsible for the hydrolysis of acetylcholine, a chemical neurotransmitter. This inhibition creates an accumulation of acetylcholine at a cholinergic synapse that disrupts the normal transmission of nerve impulses[3]. Cholinergic synapses are located in the central nervous system (CNS), in the neuromuscular endplates of the peripheral voluntary nervous system, at the parasympathetic endings and sympathetic presynaptic ganglia of the autonomic nervous system.

Blister agents (vesicants) include sulfur mustard (H / HD) and nitrogen mustard (HN), arsenicals {lewisite (L)}, and phosgene oxime (CX). Blister agents produce pain and injury to the eyes, reddening and blistering of the skin, and when inhaled, damage to the mucous membranes of the

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respiratory tract. Mustard gas may produce major destruction of the epidermal layer of the skin.

Blood agents (cyanogens) include hydrogen cyanide (AC) and cyanogen chloride (CK). These agents are transported by the blood to all body tissues where the agent blocks the oxidative processes, preventing tissue cells from utilizing oxygen. The CNS is especially affected and leads to cessation of respiration followed by cardiovascular collapse.

Lung-damaging agents (choking agents) include phosgene (CG), diphosgene (DP), chlorine and chloropicrin (PS). These agents produce injury to the lungs and irritation of the eyes and the respiratory tract[4]. They may also cause intractable pulmonary edema and predispose to secondary pneumonia.

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