

Chemical Irritants

Crowd-Control Weapons Series

Overview

Chemical irritants (CIs), commonly known as tear gas and pepper spray, are used for crowd-control purposes by law enforcement worldwide. While the public perception may be that CIs cause minimal, transient harm, the findings of a systematic review of medical literature carried out by Physicians for Human Rights identify troubling levels of morbidity and even instances of death caused by these weapons. CIs are inherently indiscriminate and therefore the risk of exposing bystanders and individuals other than the intended targets, including vulnerable people, is high.

History

The most common CIs are Agent CS, Agent OC and its synthetic form, PAVA. Agent CS was developed in the 1920s in the United States and introduced as a military weapon. It became a frequently used weapon in the second half of the 20th century and was famously deployed by the U.S. military in the Vietnam War. Agent OC was also developed by the United States and originally used as a deterrent against wild animals (and by the U.S. Postal Service against dogs). Agent OC became a law enforcement weapon in the late 1980s. CIs are banned for use in warfare but are permitted for law enforcement purposes by the Chemical Weapons Convention (1993).

How They Work

CIs are potent sensory irritants that cause pain and inflammation via multiple mechanisms. These agents work on pain and temperature receptors (TRPV1) to cause sensations of burning and severe pain. Since OC is an oil, even small concentrations of it can penetrate skin and enter mucous membranes, causing severe and prolonged (20-90 minutes) discomfort.

Device Types

Grenade and canister. This method of deployment produces a cloud of chemicals, usually within 60 seconds. It is indiscriminate by nature, and can spread to unintended targets and bystanders. Gas canisters are sometimes deliberately misused as projectile weapons fired directly at protesters at close range.

Spray. Aerosolized streams of irritants can be sprayed at distances of 2.4-3.6 meters in one to two second bursts, allowing for potentially higher doses of the chemical agent to directly strike targeted people or groups.

Other systems. CIs can also be dissolved in water to be used in water cannons, or fire hoses or contained as a powder inside a thin-coated spherical projectile (similar to

Health Effects

CIs can cause injuries to many different body systems, depending on the exposure times, concentrations, the ability of the exposed person to leave the area, and prior medical conditions of vulnerabilities.

Direct impact by the canisters and grenades carrying tear gas can cause significant blunt trauma and death.

Health Effects *continued*

Eyes. Irritation of the conjunctiva and cornea produces tearing, uncontrollable eyelid spasms, redness, and pain. The severe spasms can cause the lids to close tightly and produce temporary blindness. Vision can become blurry. These injuries may lead to corneal burns, abrasions, lacerations, and blindness.

Respiratory system. CIs cause inflammation of the airways and pain. Coughing, difficulty breathing and bronchorrhea are common. The smooth muscle of the respiratory tract may contract, resulting in airway closure and difficulty breathing. Individuals with preexisting respiratory disease may be more sensitive to these agents, even at low concentrations. Exposure may precipitate attacks of respiratory distress resulting in hypoxia, respiratory arrest, and death.

Skin. CIs cause a burning sensation to the skin as well as redness, itching or allergic reactions. Erythema (redness of the skin) usually begins several minutes after contact and can last for minutes or days after the injury. Blistering and burns of the skin as well as allergic skin reactions may also occur.

Psychological. The physical symptoms of CIs often result in disorientation and agitation, which can lead to a state of fear, anxiety and panic. In some instances of prolonged and repeated exposure to CIs in protest settings, symptoms of post-traumatic stress disorder have been documented.

Cardiovascular. CIs can cause increases in heart rate and blood pressure. Preexisting heart conditions may pose combined effects of increased heart rate and blood pressure, and hypoxia from respiratory distress may result in heart attack and possibly death. Oral and gastrointestinal mucosa. Irritation of the nose produces a burning sensation, inflammation, rhinorrhea and sneezing. In the mouth and gastrointestinal tract, exposure to CIs can cause pain, excessive salivation, and nausea and vomiting. Excessive vomiting and the toxicity of the agent can cause blood vessel ruptures and persistent pain.

Effects on pregnancy and the fetus. There are some case reports to suggest adverse effects of CIs on the fetus. Animal models indicate that miscarriages and fetal abnormalities can occur after exposure to CIs. There is insufficient population data to verify a causal link in humans, but there are case reports of miscarriage and teratogenic effects on the fetus secondary to exposure to high concentrations of CIs.

Legality of Use

International human rights law protects the right to freedom of assembly, including the right to hold public or private meetings, marches, processions, demonstrations, and sit-ins.

The state has a duty to protect those exercising their right to peaceful assembly from any type of violence, including violence from law enforcement agents and counter-protesters. As long as the purpose of the assembly is peaceful, incidental violence does not discharge the state from this obligation to protect.

International legal principles require law enforcement agencies to adopt rules and regulations for the use of force within the following parameters:

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Legality of Use *continued*

- The use of force must be minimized, targeted, proportional, and directed at de-escalating violence.
- The use of less than lethal incapacitating weapons must be carefully controlled.
- The deployment of less than lethal incapacitating weapons must occur in a manner that minimizes the risk of endangering uninvolved persons.
- Restraint must be shown in all use of force by law enforcement agents, with a view to minimizing injury and loss of life.

In addition, the state has an obligation to ensure that assistance and medical aid are rendered to any injured or affected persons at the earliest possible moment.

International human rights principles have been violated if the use of less than lethal incapacitating weapons is not adequately regulated, or if the weapons are used in an indiscriminate manner. Since CIs are inherently indiscriminate, the legality of their use is questionable.

Considerations and Policy Recommendations

- CIs, when deployed using canisters or grenades, are indiscriminate by nature. Caution should be used during deployment to stop the effect from spreading to unintended targets and bystanders.
 - Firing multiple canisters in the same spot or firing repeatedly must be avoided, as this can cause serious injury or even death.
 - Contextual factors must always be considered before making a decision to deploy indiscriminate CIs: geographical nature of the deployment site, wind patterns and temperature, or the existence of hospitals, schools, or dense uninvolved populations in the vicinity.
 - Firing grenades or canisters containing CIs into closed paces or open spaces where there is no safe egress must be prohibited.
 - Mixing more than one chemical agent or dissolving the agent into the liquid used in water cannons should be prohibited.
 - Firing gas canisters or grenades directly into a crowd or towards individuals must be prohibited.
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