

MEDICAL PROBLEMS AND CONTROVERSY REGARDING THE USE OF TEAR GAS

Recent years have seen the use of large amounts of tear gas in several countries, including Nepal; Chile; Panama; South Korea; the Gaza Strip and West Bank, Israel. It has gained widespread popularity as a means of controlling civilian crowds, for riot control, during hostage and siege situations and subduing barricaded criminals. They use it to help control individuals or groups without the need for lethal force.

Tear gas is actually the common term for a family of chemical compounds that have been otherwise referred to as “harassing agents” because of their ability to cause temporary disablement. Some 15 chemicals have been used worldwide as tear gas agents. Four of these—chloroacetophenone (CN), o-chlorobenzylidenemalononitrile (CS), 10-chloro-5, 10-dihydrophenarsazine, and x-bromo-x-tolunitrile—have been used extensively. In the western world, CN and CS have been employed most widely. O-Chlorobenzylidenemalononitrile (CS), in particular, is a weapon that has gained widespread acceptance as a means of controlling civilian populations during disturbances. Since its introduction, CS has virtually replaced CN as the riot control agent of choice in England and the United States. Proponents of their use claim, that if used correctly, the noxious effects of exposure are transient and have no long-term consequences. The use of tear gas in recent situations of civil unrest, however, demonstrates that exposure to the weapon is difficult to control and indiscriminate, and the weapon is often not used correctly.¹ In 1969, eighty countries voted to include tear gas agents among chemical weapons banned under the Geneva Protocol¹. The widespread use of tear gas agents naturally raises the question of their safety. Relatively little, however, has appeared in the mainstream medical literature regarding their toxicology.

At standard daily temperatures and pressures, CS forms a white crystal with a low vapour pressure and poor solubility in water. CS aerosols thus act as a “powdered barb” with microscopic particles which are potent sensory irritants becoming attached primarily to mucous membranes and skin. Most organ systems

of the body are affected; the eye being the most commonly affected organ causing epiphora, blepharospasm, a burning sensation, and visual problems even temporary blindness. Irritation of the mucous membranes of the nose, trachea, or lungs has been reported causing coughing, increased salivation, severe headaches, shortness of breath, tightness of chest, dizziness with induction of vomiting and possibly diarrhoea. People coming in close contact with exploding tear gas fragments have been known to sustain traumatic penetrating injuries and blistering skin burns. Persons with pre-existing lung disease such as asthma or emphysema should be observed carefully for exacerbation of their condition. The onset of symptoms occurs within 20 to 60 seconds, and if the exposed individual is placed in fresh air these findings generally cease in 10 to 30 minutes.²

In the heat of a crisis both sides may overreact by excessive use of this agent (the police using too much, rioters throwing canisters back), or the combatants may not leave the area and thus remain exposed and away from the gas’s natural antidote which is fresh air. The current recommendations in Britain for treating ocular exposure are to “blow dry air directly onto the eye.”² The recommendation of the manufacturers of CS in the United States is copious ocular irrigation to dislodge, dilute, and wash away the irritant. The US Army recommends flushing with water or saline and says that impact particles may need to be removed, although no impact CS particles have caused significant ocular damage.²

Much emphasis has been given to the findings of the Himsworth Report¹, the results of an inquiry by a committee appointed by the British Secretary of State for the Home Department following the use of CS in Londonderry, Northern Ireland, in 1969. In addition, to investigating the use of CS in Londonderry, the committee reviewed a wide range of scientific data. Its main conclusion was that while exposure to CS can be lethal, most likely in the form of toxic pulmonary oedema, such an occurrence would only be at concentrations that were several hundred times greater.

Management is conservative, beginning with aeration and the disposal of all contaminated clothing in plastic bags. Skin should be washed, although contact with water can briefly exacerbate skin symptoms from CS exposure, and a mild alkaline solution (6% sodium bicarbonate, 3% sodium carbonate, and 1% benzalkonium chloride) has been recommended¹. Persistent eye irritation can be relieved with application of a local anesthetic preparation and a patch.¹ Contact dermatitis may respond to corticosteroid creams and antipruritics. Patients who present with signs of pulmonary edema should be kept under close observation and treated with humidified oxygen; bronchodilators and ventilator therapy as necessary. Prophylactic antibiotics have been suggested. Thiocyanate assay should be considered in cases of ingestion or extremely high exposure.¹

Based on the current knowledge, if CS tear gas is used by properly trained law enforcement officers and exposed combatants leave the area rapidly, few if any, significant or long-term human disabling effects should occur.

REFERENCES

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