

88 Primary Treatment for White Phosphorus Burns

Eldad A, Chaout M, Wysoki M
Israel Defense Forces Medical Corps and Burns Unit
Hadassah University Hospital
The Laboratory for Experimental Surgery
Jerusalem, Israel

Introduction: White phosphorus (WP) is an extremely active material. It ignites spontaneously at 33°C upon exposure to atmospheric oxygen. When absorbed, WP is toxic to the liver, kidneys, and red blood cells, and may cause arrhythmias and cardiac failure. White phosphorus is used in fireworks and multiple military ammunitions. Many modalities of primary treatment were suggested in the past, from neutralization of the active material with CuSO₄ in various forms, the use of potassium permanganate, mechanical removal, and water irrigation. This study compared traditional modalities with a newly suggested method for free radical scavenging.

Methods: On a rat model, 50 mg of WP were ignited under dorsal skin flap.

Results: It was demonstrated that treatments with CuSO₄ and nonabsorbable, non-toxic CuSO₄ emulsion did not prevent mortality of the exposed animal; neither did treatment with potassium permanganate soaks, water soaks, Water Jell dressings, or Super Oxide Dismutase in sub-lesional injection. A 10-second irrigation of the wound with tap water proved effective in reducing mortality and morbidity of the animals.

Conclusions: It is suggested that no neutralization or isolation from oxygen is effective in prevention of toxic effects of white phosphorous. Mechanical removal of all particles—preferably water irrigation is the treatment of choice for white phosphorus burns.

89 Industrial Chemical Accidents and Organization of Emergency Assistance

Fonrouge JM, *Fontanella JM, **Petit P***

* Université de Bordeaux I, SAMU 71, MD, DEA,
Centre Hospitalier
Chalon S/Saone, France
** SAMU 03
Montlucon, France
*** Université de Lyon
Lyon, France

When an alarm is given of a chemical accident, the company's internal emergency plan (Plan d'Operation Interne [POI]) corresponding to the European standard defined by the Seveso Directive, is activated.

Taking into account possible worsening of the situation (escape of toxic gas and fire), the local authorities implement the "Particular Intervention Plan" in order to protect and aid the population in the vicinity of the industrial area.

Next, the various emergency teams arrive: firefighters, SAMU (medical team), police, telecom, social workers, etc.

This film shows the organization of emergency services and how major accidents may be dealt with appropriately.

90 The Effect of Chemical Warfare Mask on Patients with Ischemic Heart Disease or Chronic Lung Disease

Nahtomi O, *Roth A, **Struhar D, **Ziv I, *Hendler I, *Epstein Y, *Wiener M, *Meyerovitch J*

* NBC Branch, Medical Corps, Israel Defense Forces
** Soraski Medical Center
Tel Aviv, Israel

Objective: The effects of the increase in respiratory work wearing a protective chemical warfare (CW) mask on the ill has not been investigated. The goals were to: 1) evaluate the physiological effects of the CW mask on two patient groups having ischemic heart disease (IHD) or chronic lung disease (CLD); and 2) assess the potential role of adding a blower with air flow of 40-46 l/min, in reducing respiratory work in this population.

Methods: A total of 41 patients were examined: 21 with IHD, and 20 with CLD, in a controlled, cross-over design. The protocol was based on the cardiorespiratory exercise test. Respiratory and ECG parameters were monitored at rest, during exercise, and at recovery.

Results: Wearing the mask caused a significant increase in ventilation and O₂ consumption. Moreover, eight patients did not complete the protocol because of bad subjective feeling and two patients had ischemic changes on the ECG following exercise. The addition of a blower to the mask was associated with a significant decrease in respiratory work, smaller ECG changes, and improved subjective feeling.

Conclusion: Protective CW mask substantially increases the respiratory work in patients with IHD or CLD. Adding a blower to the mask will reduce the respiratory work and ease their bad subjective feeling. Therefore, it is recommended that a blower should be added to the CW mask in these patient groups.

91 Unanticipated Problems Stemming from a Long-Term Hospital Alert for Non-Conventional Warfare

Michaelson M, Geva H, Revach M, Reznikivitz S
Rambam Medical Center
Haifa, Israel

Rambam is a 900-bed general hospital serving the population of Northern Israel. Before the Gulf War began, the hospital's resources had to be organized to accept civilian, non-conventional war injuries. Anticipated problems included:

- 1) preparing for mass casualties;
- 2) lack of treatment experience, treatment stations, and specific equipment for non-conventional war injuries;
- 3) decontamination of the injured;
- 4) protection of staff and patients; and
- 5) anxiety and stress of staff and public.

Rambam developed a program to overcome these obstacles. Regular hospital services were suspended and a high level of readiness mandated by the program was maintained for the duration of the war (two months). The intensity and length of the program produced various unanticipated problems such as:

- 1) maintaining the necessary level of alert;
- 2) staff fatigue from 12-hour shifts;
- 3) idle hours that reduced enthusiasm for continuation of the program; and
- 4) anxiety of staff with family members at home during SCUD missile attacks.

This presentation will discuss these problems, along with solutions, so that they may be dealt with better or be avoided in similar future situations.

92 Hospital Training Exercise for Mass Chemical Warfare Casualties

Robinson A, Shapira Y, Bar Y, Wiener M
Israel Defense Force
Israel

Introduction: The preparation of hospitals for absorption of chemical warfare casualties demands planning an exercise and training program for hospital personnel and auxiliary services.

Methods: A unique scheme was devised for triage, decontamination, therapeutic treatment, and life-saving procedures to prepare the hospital for such an event. The exercise is preceded with introductory lectures for the hospital staff on the clinical aspects and the therapeutic treatment of chemical warfare injuries.

Results: During the exercise, the hospital receives a multitude of simulated chemical warfare casualties of varying age and injury severity. These "casualties" pass through triage, decontamination, and appropriate therapeutic treatment. The medical and auxiliary staff who treat casualties before and during decontamination wear full protective gear. A specific kit consisting of equipment and antidotal drugs necessary for treatment of chemical warfare casualties is used. Medical and logistic controllers check the hospital management at various stages of the program.

Conclusions: It is believed that this scheme, repeated on a regular basis, can preserve optimal management of the hospital in the event of a chemical warfare attack.

93 Joint Activity on Health Aspects of Chemical Accidents

*Haines JA, * Stevens J, ** Visser R, *** Younes M, + Kulling P, ++ Savelkoul J+++*

* IPCS, Geneva, Switzerland

** UNEP (IE/PAC), Paris, France

*** OECD, Paris, France

+ WHO (ECEH), Utrecht, The Netherlands

++ Swedish Poison Information Centre, Stockholm, Sweden

+++ Department of Intensive Care-Clinical Toxicology,
University Hospital
Utrecht, The Netherlands

Four international organizations: 1) International Programme on Chemical Safety (IPCS) (ILO/UNEP/ILO); 2) World Health Organization-European Centre for Environmental Health (WHO-ECEH); 3) Organization for Economic Cooperation and Development (OECD); and 4) United Nations Environment Programme-Industry and Environment Programme Advisory Committee (UNEP-IE/PAC) have undertaken a joint project to prepare guidance on health aspects of chemical accidents. A general guidance document for policy-makers and a technical document for various professionals involved in planning and response to chemical accidents is being drafted.

The documents to be published and distributed worldwide are the result of drafting work by a group of experts in the field from all over the world, and the examination at an international workshop of some 70 experts, held in April 1993. These documents are concerned with various aspects of the health sector's responsibilities in preparedness for an response to chemical accidents, including provision of information, organization and planning, patient management, and education and training.

The guidance material on health aspects of chemical accidents will be used by the four organizations in their various programs dealing with chemical accidents. The technical document is intended to be used by health care professionals, and also addresses those at the operational level who are responsible for preparing and implementing chemical accident contingency plans. This document will be a valuable training tool for these various professionals.

94 The International Chemical Environment (ICE) Project

Jonckheere F

European Chemical Industry Council-ICE
Brussels, Belgium

Although the chemical industry has a fine record in transport safety, it is committed to continuous improvement. Under its Responsible Care Initiative, the statement is: "one incident is one too many." The International Chemical Environment (ICE) is a cooperative program between chemical companies to prevent chemical transport incidents and to respond effectively if and when they do occur.

The ICE was started in May 1990 by a small group of chemical companies which recognized the need for such coopera-