CHEMICAL ACCIDENTS

80
Poison Center (PC) Participation in a Municipal Chemical Disaster Exercise

Vicas IMO
Poison and Drug Information Service
Foothills Hospital
Calgary, Alberta, Canada

Calgary, population 600,000, planned a citywide disaster exercise "Green Cloud" involving a chemical exposure to chlorine, as a test for emergency services (fire, police, ambulance) and hospitals. Five of the six acute care hospitals participated.

The poison center (PC) sought participation in this exercise in order to: 1) implement a recently developed internal disaster plan; and 2) identify hospital and prehospital requirements for PC expertise and resources. The internal disaster plan consisted of a detailed communication and procedure protocol as well as a multi-casualty incident form developed specifically to improve the capture of patient data under disaster circumstances. Miscommunication at the scene during the disaster exercise, with hospitals not being informed specifically of a chemical exposure, resulted in under-utilization of the PC as a source of information/advice. The experience has shown that although hospitals and municipal disaster committees recognize the value of PC involvement in a chemical disaster, neither group initially considered including the PC in a formal city disaster plan. As a result of this exercise, the PC has been included in hospital disaster plans and discussions are underway to formalize involvement at a municipal level.

Conclusion: A poison center should seek active involvement with hospital and municipal disaster committees, including participation in disaster exercises, and become an integral part of the EMS response to hazardous materials accidents. It also offers the opportunity to implement internal poison center disaster plans and make appropriate modifications.

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Argentine Chemical Information Center for Emergencies

Gotelli CA, Grande J,** Gotelli DN**
* Chemical Information Center for Emergencies (CIQUIME)
** Ministero de Salud y Accion Social
Buenos Aires, Argentina

The Chemical Information Center for Emergencies (CIQUIME) is an example of cooperation between the Health Ministry and a private institute. Its main goal is to provide the population with practical and updated information about how to manage chemical emergencies. Other activities include:

1) national hazards mapping;
2) dangerous areas identification;
3) specialized human facilities census;
4) sanitary facilities census;
5) courses and training programs for firefighters and rescue teams; and
6) development of first-aid guides for hazardous materials incidents.

This paper also includes statistics about incidents, a description of an incident and the measures that were taken, how information is classified, and a brief report about the Argentine situation relative to transportation of hazardous materials.

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The Emergency Response Plan of the Japan Poison Information Center in the Event of Chemical Disaster

Goto K, Ukai T,** Kusakawa S,* Yamamoto Y,*** Yoshioka T+*
* Japan Poison Information Center
Tokyo, Japan
** Osaka Prefectural Senri Critical Care Medical Center
*** Nippon Medical School
\+ Osaka University
Osaka, Japan

With the increasing use of hazardous materials in industry, the risk of human-made disasters by those chemical substances has increased. In 1990, more than 300 accidental explosions and spills of hazardous materials occurred in petrochemical complexes and industrial areas in Japan.

As a test case, the Japan Poison Information Center (JPIC) investigated chemicals in Nagoya, one of the petrochemical complexes in Japan, and the need for chemical information by medical facilities in the event of chemical disaster. The main problem was that very many chemicals were handled in that region, but few people were aware of JPIC's activities. Very few medical facilities wanted to obtain information to prepare for disaster prior to being overwhelmed by panicked citizens.

Currently, investigations are being conducted in all coastal regions in Japan and medical associations in affected areas. The present study is aimed at surveying the types of chemicals handled in a particular operation center, the preparation of local government bodies to deal with chemical disasters, and ways in which JPIC can be of service to the region.

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Computerized Management of Industrial Incidents

Magalini SI, Barelli A, Sandroni C
Catholic University School of Medicine
Rome, Italy

When responding to an industrial accident, the initial task is the identification of the hazardous products involved. Numerous publications are available to accomplish it, but only a few of these are computer-based. The Poison Control Center of Catholic University in Rome, in cooperation with the European Centre for Disaster Medicine, currently is building a new database specifically oriented to the identification of all hazardous materials potentially involved in major chemical acci-

dents. To be available at all levels for prevention and management, the program has been designed for an IBM-PC and compatibles, and it requires only a basic hardware configuration. The user-friendly interface allows the location of the product by use of different keys (commercial name, chemical name, symptoms, chemical, and physical properties). Information provided includes: physical and chemical characteristics; effects on humans; preventive measures; therapy; and data on other previous incidents. For each substance or group of substances, it is possible both to edit all data on the screen and to print out a report. We believe that this data bank has the fundamental feature to be made available at all levels of disaster management (factories, occupational medicine, health emergency, and poison control centers), and thus help to facilitate a quick and effective response to industrial disasters.

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A Health Emergency Plan for Hazardous Chemical Industries

Pellicciotti G, Rocchi V,** Macchi C,*** Petazzi A*[+]
* ISPESL Milano
** ISPESL Roma
*** Ospedale de Circolo di Varese
[+] USSL
Milano, Italy

Objective: The area around the outskirts of Milan is densely populated; near the city of Rho, there is an industrial area that includes plastics industries, an oil refinery, storage, and distribution plants for its by-products, and many chemical industries. Thus, the Health Areas, the Authorities for Civil Protection, Fire Brigade, and ISPESL decided to draw up a study for the management of possible emergencies according to the European Economic Community (EEC) directive 85.301.
Methods: First, a list was made of the firms with a potentially high fire hazard and/or possibility of explosions involving the release of toxic substances. The Health Area then collected figures on the type of production, the substances used, their quantity, type of usage and storage, the number of employees, types of alarm systems and existing safety measures in all the firms situated within a 1-km radius of the firms with hazardous materials, as there could be interaction in case of an accident. Using these data, an emergency plan was drawn up involving all the authorities, particularly the Health Area and its emergency services.
Results: In a practice exercise, the release of a large quantity of anhydrous ammonia with the formation of a gaseous cloud was simulated. During the exercise, the type of risk, the area that could be affected, and the number of people present were defined. These data then were examined in order to pinpoint a first-aid center near the site of the plant but outside the area of propagation of the cloud. In addition, other centers for health care situated in the vicinity, but outside the risk zone, have been selected to guarantee the availability of services in the case of a disaster. A major hospital in Milan with a heliport is available for casualties requiring treatment for serious burns or poisoning. The emergency plan foresees a warning signal in case of danger, plus the rapid activation of all the health services concerned that are answerable to a single, coordinating unit. Roads and arteries inside the area also have been located for the soccours and alternative routes from the critical area for the civil traffic. The storage for the logistical equipment should be located centrally as should the places for disbursal of aid commodities.

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Problems Related to Large-Scale Chemical Disasters

Babievsky K
Russian Academy of Sciences, Institute of Food Compounds
Moscow, Russia

As demonstrated by the Bophal tragedy, direct losses resulting from damage to chemical plants and storage facilities for fuels and chemicals may be tremendous and will not exhaust the possible consequences of this type of accident. The biological and medical implications of disasters can be classified into three groups:
1) damage to the human habitat resulting from the spread of a fireball or toxic cloud;
2) damage to the population exposed to the combustion products released during the accident; and
3) genetic damage and disruption of hereditary mechanisms in the offspring of living beings exposed to toxicants during and after the accident, particularly the effect of dioxin on fetuses and newborn infants.

The consequences immediately following a chemical disaster will persist for many years. Continued habitation in the affected area will bring about deteriorated health and higher morbidity rates.

This presentation will include examples and possible methods of prevention.

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The Decontamination of Contaminated Chemical Casualties

Bellanger C, Henry A, Dons D
Royal School Military Medical Services
De Han, GENT, Belgium

Confronted with a chemical disaster, the medical teams need to evaluate the risk of contamination; the dispersion of a toxic agent represents a risk for the environment, the intervention team, and the casualties themselves.

This risk is determined by the physico-chemical properties of the chemical agent and by environmental conditions. Only a few factors are important in the first moments after the incident. For different reasons, the decontamination of the casualties must be performed as soon as possible. This is necessary not only for therapeutic reasons, but also to avoid overloading the medical system due to the necessity of protective measures for personnel and equipment. Most importantly, the hospital staff must be able to treat the arriving casualties without special protection.