Preparedness of the Israeli Health System for a Biologic Warfare Event

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Key words: health system, biologic warfare, preparedness programs, committees, doctrines

Abstract

The threat of a disease outbreak resulting from biologic warfare has been of concern for the Israeli health system for many years. In order to be prepared for such an event the health system has formulated doctrines for various biologic agents and defined the logistic elements for the procurement of drugs. During the last 4 years, and especially after the West Nile fever epidemic in 2000, efforts to prepare the healthcare system and the relevant organizations were accelerated. The Director-General of the Ministry of Health nominated a Supreme Steering Committee to fill in the gaps and upgrade the preparedness of the health system for an unusual disease outbreak. This committee and its seven subcommittees established appropriate guidelines, communication routes among different organizations, and training programs for medical personnel. The anthrax outbreak in the United States found the healthcare system in the hub of the preparation process, and all modes of action were intensified. Further work by hospitals, primary care clinics and all other institutes should be increased to maintain a state of proper preparedness.

IMAJ 2002;4:495–497

For many years, the Israel Ministry of Health, the Israel Defense Forces Medical Corps and the Home Front Command have worked on preparing the Israeli healthcare system for disease outbreaks at wartime or during times of peace. The preparedness of the health system has focused on the development of doctrines for various biologic agents, as well as on the logistic elements for the procurement of drugs.

The threat of a possible Iraqi missile attack carrying non-conventional weapons emerged during the Gulf War in 1991, and later, at the beginning of 1998 with escalation of the threat in the Persian Gulf, awareness by the Israeli population regarding biologic warfare increased. During this period confidential doctrines were conveyed to the medical community.

In the summer of 2000, an outbreak of West Nile fever occurred in Israel, causing substantial morbidity and mortality. A total of 439 patients were diagnosed with WNF, and 35 patients (8.4%), mostly elderly, died from the disease. This outbreak revealed various gaps in the preparedness programs and doctrines, both in the health system and in other government ministries. The first lessons from the WNF outbreak were learned at a tabletop drill conducted one month after the end of the outbreak, where the WNF outbreak served as an example of a possible bioterrorism incident. All medical and environmental organizations were represented at the drill. The main conclusions were:

- The Ministry of Health must appoint an advisory professional task force to deal with disease outbreaks (natural or intentional). This task force, called the epidemic management team, is to be redeployed from the Medical Corps to the supreme health authority. The epidemic management team will include expert physicians in the field of infectious disease, a veterinarian, a psychologist, and others as advisors.
- There is an urgent need for a national integrative director for biologic warfare events.
- Disease surveillance in Israel should be improved.
- Coordination between the Ministry of Health and all the other bodies involved in dealing with such an event is poor and should be improved.
- Methods for information delivery to the general public and to healthcare professionals should be developed.
- The preparedness of laboratories in Israel for a biologic warfare event should be evaluated.

Methods

A supreme steering committee for a biologic warfare event was nominated by the Director-General of the Ministry of Health. The steering committee's main goal was to fill in the gaps and upgrade the preparedness of the health system for a biologic event. The committee, headed by the Director-General, comprises many professionals representing the various health organizations, both civilian and military. This includes hospitals, community medical services, the Department of Public Health, the Israel Center for Disease Control, the Ministry of Defense, the IDF Medical Corps, the Home Front Command, the Veterinary Institute of the Ministry of Agriculture, and the Ministry of the Environment.

In order to deal effectively with the complex tasks of the preparedness program, the steering committee assigned seven professional committees as follows:

Doctrine committee

This committee is responsible for the formulation of operational concepts for the health system, and the formulation and development of doctrines for different biologic agents. This committee is also responsible for defining the precautions and protective

WNF = West Nile fever

IDF = Israel Defense Forces

measures needed for the various agents, and the resources for providing medical treatment.

Surveillance committee

This committee is responsible for developing methods for monitoring and identifying unusually high morbidity or mortality in the population as signs of biologic warfare events. The committee works on the basis of the present system of the Israel Center for Disease Control. The committee is developing a computerized epidemiologic system to provide information on morbidity and mortality rates, based on various sentinels from general hospitals, community services, veterinary services, etc.

Laboratory committee

This committee is responsible for preparedness of the various laboratories in Israel for a biologic warfare event. The committee coordinates between the hospitals, the Ministry of Health and other laboratories. This network of laboratories is essential for an adequate response in case of such an event [1]. The committee also evaluates the ability of different microbiologic laboratories to deal with and identify biologic warfare agents.

Advisory committee for hospitals

This was the first committee to be established and has been functioning since 1996. The committee is charged with preparing hospitals for outbreaks caused by biologic warfare agents or by naturally occurring diseases, formulating protocols, as well as establishing a training program and methods for hospital personnel.

Community and public health committee

This committee is responsible for preparing community healthcare services. The committee includes primary care service providers of the health maintenance organizations and the regional and district public health services.

Public information committee

This committee is responsible for providing information and for public education. It defines the specific principles for information distribution and for spokespersonship with regard to the differences between conventional and biologic terrorism. The committee is responsible for the preparation of various tools for information dissemination aimed at informing the public whenever needed (before or during an outbreak).

Healthcare professionals' education and training

This committee is responsible for delivering up-to-date information to healthcare professionals regarding biologic warfare agents that may be used for terrorist attacks or during wartime. This information should help caregivers to identify clinical characteristics that are suspicious for biologic warfare. The team designs plans for the various sectors, such as the Ministry of Health, hospitals, the community, public health and "Magen David Adom" (The Israeli Red Cross).

Results

During January to August 2001, the WNF outbreak was used as a primary platform for the work of all committees, although West Nile virus is not a biologic warfare agent [2]. The rationale for that decision was as follows: a) there was high probability for another WNF outbreak; b) this model enabled us to examine whether the lessons from the 2000 outbreak were learned; c) since WNF is not a bioterrorism agent it can be coped with without causing anxiety in the general public; d) since a primary surveillance system for WNF already existed there was no need for large budgets and work could begin; and e) the WNF model requires coordination between several government bodies, including the Ministry of Health, the Ministry of Agriculture and the Veterinary Services, and the Ministry of the Environment.

The output of the multidisciplinary endeavor by the various committees constituted a comprehensive doctrine for a WNF outbreak, including clinical guidelines. A tabletop drill was conducted with the participation of representatives from all the health authorities in Israel. A primary surveillance system was created, and connections to other information sources such as the veterinary services, the pest surveillance and control services, and the central virology lab began to emerge. A primary model for laboratory procedures in the event of an outbreak was presented and a model for management of biologic casualties was offered. The model deals with management of natural biologic events as well as a bioterrorism attack, from the level of the "sentinels" in the field through the Israel Center for Disease Control, the Ministry of Health's Director-General, to the national director of the event. Foundations were established for mutual and interdisciplinary working modalities with representatives of various ministries and governmental agencies to coordinate the preparedness for a biologic event. Among these agencies are the Ministry of Agriculture, the Ministry of the Environment, the Ministry of Internal Affairs, the National Security Council, the Israel police, and other organizations.

Starting in August 2001, the supreme steering committee defined scenarios consistent with the various biologic agents. A perennial working plan was developed for all the scenarios and agents. When terror struck on 11 September 2001, the threat of bioterrorism became a reality. It was time to expedite processes, shortcut schedules and be prepared for unpredictable scenarios [3].

A comprehensive plan for bioterrorism was formulated. The work was based on a core of professional teams. These included:

- *The clinical guidelines team*, which developed case definitions (for exposed and sick patients) and defined algorithms for patient management. The guidelines were based on recommendations of the Centers for Disease Control and Prevention (USA) with appropriate local tuning, and were updated according to the information that was learned from the anthrax casualties in the USA.
- *The protection team*, which defined specific procedures for handling materials suspected of anthrax contamination.
- *The laboratory team*, which regulated the management of clinical specimens in hospital laboratories and their delivery to the Israel Institute for Biologic Research (IIBR) laboratory; the public health authority would coordinate the work of the Ministry of Health laboratories with the IIBR laboratory. Other agencies, including the police and the Ministry of the Environment, were also involved in the handling and transferring of samples

between laboratories, and were coordinated with the help of this team.

- *The community team*, which focused on the preparedness of the community for providing post-exposure prophylaxis. This team designated centers capable of administrating post-exposure prophylaxis to an exposed population, collection of epidemiologic data, and providing information to the public. The team defined the functions of the center, including responsibilities, personnel required, the role of each staff member, and an algorithm for the management of exposed patients in the center.
- *The education and training team*, which devised a guidance and educational plan for the various sectors in the health system, which included conferences, lectures, simulation games, and the distribution of an educational CD-ROM to a large number of physicians in the country.
- *The public information team*, which formulated principles for information distribution and spokespersonship before and after the first case of anthrax in Israel.

A national healthcare preparedness program for an anthrax terror attack was presented to and approved by the Director-General of the Ministry of Health. The doctrine is currently being conveyed to the entire health system, and will be evaluated by a tabletop drill with the participation of the representatives of all the involved sectors.

Discussion

The last few years have seen the gradual disclosure of the subject of bioterrorism [4,5]. The main change was in transferring the preparedness task from the military to many civilian organizations. During this period much effort was invested to deal with the subject of bioterrorism and to enable the different civilian organizations to cope with such a horrific specter. The entire process was led by the Ministry of Health.

The Ministry of Health and the army hold the responsibility for the preparedness of the medical system for non-conventional scenarios. Preparedness programs are developed primarily by these sectors, and then distributed to the operational level. The responsibility for implementing the doctrines and for medical staff training lies with the healthcare providers, i.e., the HMOs, at the operational level [6,7]. This was demonstrated by the training method developed by the relevant committee, whereby the hospitals and HMOs, with the help of the Ministry of Health, were responsible for lectures and distribution of information.

The primary goal of the supreme steering committee and its subcommittees' activity in case of a biologic warfare event was to prepare the healthcare system for such an event and to minimize its impact. Main efforts were targeted at the following areas:

- Build-up of the "sentinel" system, which is human and animal-based, in order to disclose an unusual event as early as possible [8]. This was achieved by preparing case definitions and clinical guidelines at all levels.
- Protocols describing the appropriate steps necessary for identification of a suspicious biologic agent, and the initial measures required in patients suspected of exposure.
- A national educational campaign for medical professionals, as a tool for boosting knowledge and alertness.

The number of agents that might be used as biologic warfare agents is high. Thus, preparing a comprehensive doctrine for each agent is not a reasonable approach. Rather, model agents were chosen for non-contagious agents, contagious agents and toxins, and doctrines were developed for them. For example, the doctrine developed for anthrax, a non-contagious agent, can be used with minor alterations for other agents of the same group, such as Q fever or *Brucella*.

Coordination within the medical system and effective communication and cooperation with non-medical ministries was improved by the work of the committees. This coordination is essential for the achievement of the desired results during the response phase. While much was achieved at the executive level, considerable efforts are still needed at the operational level – i.e., in hospitals, laboratories, primary care clinics, etc.

Conclusion

The events of 11 September found the health system in the process of learning and establishing various protocols and guidelines for a biologic warfare event. The terror attack on the United States increased the rate and urgency of the committees' work and improved our preparedness. The key for an optimal response is the action of a small number of professionals at the early phase of the event, and the integrated response of many individuals and organizations at the advanced stages. Implementing all the guidelines and governing the responsibility of the operational institutions will ensure a proper response. The process within the Israeli health system, as reviewed in this paper, significantly improved the national ability to manage an outbreak resulting from biologic warfare.

HMO - health maintenance organization

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