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ISRAEL'S READINESS FOR HEALTH EMERGENCIES

Due to the geographic locations of Slovakia and the Czech Republic in Central Europe and the perceived threat of a mass terrorist act, along with the current economic climate, this article looks to determine the degree of readiness of both the Czech and Slovak Health Systems in addressing the impact of incidents in which there would be a large number of affected among population, particularly in cases where civilian contamination by any substance belonging to the group of CBRN (chemical, biological, radiological and nuclear agents) is minimal. Specifically, this article will inform readers about the readiness of State Health Services, in which the population is exposed to this risk for decades on end, and the number of victims of such attacks will be higher than ten thousand (10,000). As this model is one the State of Israel is accustomed to, all data from the Czech and Slovak Health Systems will be seen in reference to Israel's performance, and further recommendations will be made where the Czech and Slovak Health Systems are found to be lacking.

Keywords: Emergency preparedness, crisis management, terrorism, health services, medical response, Israel.

1. Introduction

The health sector in the Czech Republic, encounters few crisis situations [1] which involve a number of wounded or disabled individuals, therefore, leaving the majority of hospitals ill-equipped and at a disadvantage should such scenarios occur.

The major contributing factors for this are as follows:

- There is a minimal amount of theoretical training given to medical personnel, including physicians.
- The effectiveness of practical exercises carried out in health care facilities is grossly underestimated, and in some cases fully dismissed.
- A lack of material supplies, a common by-product of the current financial situation in the health sector, coupled with the State attempting to leave health facilities shouldering the costs alone, has had a crippling effect on running crisis prevention drills.
- A general malaise felt on the part of the populace when it comes to the gravity of a terrorist attack in Central Europe.
- The mainstream media contributes to the aforementioned malaise by downplaying the scope and reach of such terrorist groups like Daash (ISIS/ISIL), and Al-Shabaab, leading many to think of terrorism as an African problem, as opposed to a European or world issue.
- Czech Republic also lacks the specialized departments needed for dealing with heavy casualty scenarios.

Even in the Slovak Republic, in the health sector field of crisis management there are a number of shortcomings that may have a negative impact in the event of an actual threat to the population.

On the other side of this scale is Israel, a country whose citizens understand the threat of terrorism all too well, and whose health facilities handle mass casualties on a regular basis with maximum efficiency and professionalism.

2. Gertner Institute

Playing a vital role in this area, the Gertner Institute (Fig. 1), founded in 1991 by Professor Mordechai Shanim to promote extensive epidemiological research of key chronic diseases and to formulate a national policy for health services, has housed since 2001, the Israel National Center for Trauma & Emergency Medicine Research Center, directed by Prof. Dr. Kobi Peleg, M. D., Ph.D., MPH [2].

Serving as the official workplace of the World Health Organization from 2011, the research center is involved in many international projects aimed at the prevention of accidents, including those, of course, resulting from acts of terror.

While the main task of the organization is to lead the National Trauma Registry (a network of 17 hospitals and over 200,000 patients), the center itself has a multidisciplinary

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Fig. 1 Gertner Institute

character working with experts from varying fields spanning from technicians, chemists, physicists, psychologists to medical response teams. All data is accessible and is regularly analyzed through the Barell Matrix to maintain high quotas of quality control where by key trends of high-risk groups can be identified allowing for the effective use of hospital equipment and procedures.

The main objectives of the center are as follows:

- [a] Manage, maintain and update the National Register.
- [b] Research, document and present fresh data.
- [c] Use the data found in point b in order to improve the quality of health care, therapy and crisis prevention.
- [d] Draw attention among the medical community and populace about the range of issues faced.

The center has an extensive network of cooperating organizations, both domestic and foreign. The activities of the Gertner Institute are significantly larger than similar facilities. It is the guarantor of the activities carried out by the Center for Disease Control and the Israel National Institute for Medical Research, Care, Policy and Services. It is responsible for monitoring any reforms or change management needed, an important aspect for the national economy and the related health of the population.

Besides the "Trauma" center there are other operators at work at the Institute including those focused on:

- The study of ionizing and non-ionizing radiation on an organism.
- Genetic and molecular epidemiology.
- Epidemiological studies of infectious diseases, focusing on the transmission of pathogens in the community and the interaction between the host and pathogen to prevent infectious diseases.
- Pharmacology.
- The epidemiology of malignant diseases.
- Epidemiology of atherosclerosis, including a healthy diet.

- Telerehabilitation or the complex methodologies used to monitor the rehabilitation of the patient through their home computer, therefore, not forcing them to leave home, providing consultations 24 hours a day, 7 days a week. Results are evaluated in real time using a computer system, which provides immediate feedback.

3. Sackler Faculty of Medicine, Tel Aviv University

The Sackler Faculty of Medicine, at Tel Aviv University is Israel's largest medical faculty. It currently has over 3,000 students involved in master studies and about 1,400 teachers and lecturers. The vast majority of teachers operate in one of the 17 teaching hospitals which provide health care for more than two million inhabitants.

The Sackler Faculty of Medicine devotes considerable attention to reforming and improving their teaching methods and the curriculum, their goal being to prepare future doctors in coping with the exponential growth of technical knowledge (one approximately doubling every 30 months). The Sackler Faculty of Medicine believes that students must acquire the habits of critical thinking based on evidence-based medicine. This modern approach in educating future physicians is interactive, based on an interdisciplinary study of individual systems to strengthen the contact between the doctor and patient known as the MPS program (Medicine - Patient - Aid Company) [3].

This faculty recently built a "Laboratory of clinical skills" which gives students the opportunity to learn clinical skills using computer simulations, sophisticated animated models and other advanced techniques.

The extensive medical research undertaken by the Faculty there is funded by a number of companies, including full cooperation with pharmaceutical companies in developing new medicines and medical technologies, thereby again allowing for many of the lessons learned in the field or due to data gathered to be quickly put into practice as shown by the 1,200 patents achieved.

4. Hospital Tel-Hashomer ha

Hospital Tel-Hashomer ha (or the Sheba Medical Center) lies on the southern outskirts of Tel Aviv and is the largest hospital in the Middle East. Founded in 1948 to serve as the first military hospital in Israel, there are several buildings still preserved from the original hospital layout (Fig. 2) which are currently used for long-term patients, lower staff accommodations and technical support.

Providing medical care for approximately 1.5 million patients, the hospital is located on 60 hectares of greenery, houses more than 1,990 beds (Fig. 3), and employs 7,500 people (1,400

doctors and 2,600 nurses), covering 25% of all examinations performed in Israel.



Fig. 2 Original hospital layout



Fig. 3 Hospital Tel-Hashomer ha

Sheba Medical Center's Department of Surgery is divided into 18 departments and has 362 beds, employing 280 doctors and 500 graduate nurses. In the Intensive Care Unit, each bed is equipped with monitoring devices, ventilators and other necessary equipment. Within the Department of Anesthesiology and the Intensive Care Unit there are two wards (15 and 16 beds) with similar instrumentation as the surgical clinic. All medical and nursing documentation is conducted strictly by computer, providing quick access to patient information.

In the event of an emergency the hospital initiates a program called extraordinary mode where normal shift operations are changed to meet a two-shift at twelve-hour schedule.

The hospital is ready at any given time to receive a considerable amount of affected casualties contaminated with toxic, biological, radiological and nuclear agents. The contamination line is located outside a large concrete area, along with cleansing showers set

at different heights allowing for those standing or those that are transported via wheelchair or hospital bed to be quickly cared for (Fig. 4).



Fig. 4 Decontamination area

Those affected are brought directly to the decontamination area via ambulance or helicopter, and then are transferred to the entrance of a designated building equipped with an internal environment sealable door where a checklist is gone through as to ascertain further therapeutic procedures needed.

Additionally, the hospital is outfitted with a powerful source of backup electricity, domestic hot water tank, and tanks with potable water.

5. Rabin Hospital and Rabin Health Center

The hospital is located in the center of Petach Tikva which now fully merges into Tel-Aviv and consists of two historical institutes of health. One institute was originally named after the founder of the first Israeli blood bank, Dr. Moshe Beilinson (1889 - 1936), and the other is named after the former Israeli Prime Minister Yitzhak Rabin.

These institutes with 1,300 hospital beds, 4,500 employees, 1,000 physicians and 2,000 nurses, have housed numerous medical firsts for the Nation, including the first use of dialysis in 1968 and in 1995 the first heart transplant.

Rabin is part of the hospital department designated to receive the wounded during emergencies. The department's receiving center (Fig. 5) is equipped with a sufficient number of separate ambulances, allowing for a patient to receive varying types of care. The patient can be treated either on an outpatient basis, including infusion therapy, then transferred to home care or inpatient care in the appropriate department. As in other Israeli hospitals, extraordinary mode equates to twelve-hour shifts for the staff.



Fig. 5 Department's receiving center of Rabin Hospital

The hospital is also equipped with the latest medical technology, allowing for blood samples to be quickly sent for analysis through a special laboratory tube post.

6. Organization of Health Services

Four main health insurance companies operate in Israel, covering 29 large hospitals, 21 psychiatric hospitals and 242 after-care or geriatric hospitals (with about 18,200 beds).

The 29 large centralized hospitals (with about 14,000 beds) are used to ensure high levels of efficiency during emergency care in cases of mass disasters. In addition to large hospitals there are still a number of non-governmental health facilities owned by non-governmental organizations or endowments also accessible to the public.

The emergency services organization of Magen David Adom (MDA, literally translated to the *Red Shield of David*), was founded in 1930 and was originally run on a voluntary, non-governmental basis. The basic goal of the MDA is to provide first aid at the epicenter of a crisis, as to not to overload nearby hospitals, while also helping to identify terror victims.

There are 11 regional centers throughout the region, with more than 700 ambulances with basic amenities (Basic Life Support), indicated by blue stickers, and about 110 ambulances for full resuscitation and intensive care (Advanced Life Support) noted by red stickers. The MDA has an armored mobile intensive care unit, and their Air Rescue Service has 105 helicopters which cooperate with the Israeli Air Force when necessary [4].

All hospitals involved in crisis management decontaminate surfaces and equipment before entering patients into the interior

and must be equipped with a hermetic closure with pressure system in the event of chemical and radiological emergencies. All of these medical devices must go to extraordinary mode in 15 minutes and be ready to receive the bulk of the affected from the disaster. Each hospital must have permanently available medical supplies to security emergencies and allow for a 20 percent hospital bed capacity. All hospitals, therefore, require a perfectly prepared and practiced emergency plan, with functions that shall be checked at least once a year.

The National Blood Transfusion Service also plays a vital role in Israel's emergency recovery responses, by having detailed information on each donor, and maintaining a surplus blood supply, 90 percent of which is collected by mobile units.

Finally the digital information systems used in Israeli hospitals are bidirectional and allow for information to be passed quickly from physicians to patients with ease [5].

7. Conclusion

The health system of the state of Israel is fully prepared, based on their years of experience with a high number of terrorist attacks. Their crisis management system is efficient, effective and economically sound. It has the support of both the government and the populace, and as of such, the adoption of the procedures used in Israel would surely benefit both the Czech and Slovak Republics [6] and [7].

It is therefore essential that the issue of crisis management in health care becomes a permanent part of the undergraduate and the postgraduate training for doctors, while adding in aspects of career long or lifelong learning. The situation is deemed to be much more favorable for paramedics.

The risks of emergency situations coupled with the various possibilities of prevention and protection must be repeatedly presented to the population through public media and other appropriate forms of education.

Protecting the population must become a priority of state and local governments. An apparent case of these measures being disregarded can be found when the Prime Minister of the Czech Republic, Mgr. Bohuslav Sobotka was forced to apologize for the extraordinary incompetence shown in the handling of the situation at the ammunition depot in Vrbětice, located in the Zlin region.

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