

increase of pulmonary vascular permeability and of lung water, attenuate the sequestration of neutrophils into lungs, alleviate the endotoxemia, decrease the concentrations of THF, IL-8, and PLA2 in plasma, lung tissue, and BALF.

Keywords: acute lung injury (ALI); acute respiratory bacteria translocation; distress syndrome (ARDS); endotoxemia; infection, abdominal; lung injury; mechanism; mediators; model; rats; rhubarb; sepsis

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Computer Simulation for Planning the 3 Ts: Responding to an Airport Disaster

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The purpose of this study was to develop a guideline for the 3 T's: triage, transportation, and treatment in the case of a disaster with large-scale casualties such as a plane crash or explosion at the Kobe Airport. In the aftermath of the Kobe Quake in 1995, Kobe City initiated a new project to build an airport located on the sea next to the artificial Port-Island in the Kobe Bay area. As the airport will be open in 2006, the emergency plan must be developed for medical disaster response at the airport.

All hospitals in Kobe City were evaluated with respect to geographical locations, the availability of transportation from the Kobe Airport, and emergency medicine capability. The information collected was organized to build a network-flow model that logically connects all the hospitals. To analyze the behavior of the model, computer simulation was conducted according to the grades of disaster.

A priority list of the hospitals in terms of the 3 T's was constructed corresponding to the grade of disaster. It also indicated the time distributions required for triage and transportation, which suggested the insufficient capability of current hospitals to respond to intermediate or larger-scale of disaster.

Computing technology is useful for developing a disaster plan regarding the 3 T's, and has great potential for future improvement combined with geographical information systems.

Keywords: computer simulation; disasters; disaster planning

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Postmortem Computed Tomography after Unsuccessful Resuscitation of Out-of-Hospital Cardiopulmonary Arrest Patients for Defining Cause of Death

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Background: It is difficult to definitively diagnose patients with unsuccessfully resuscitated out-of-hospital cardiopulmonary arrest (CPA), because their medical information is extremely limited. It was hypothesized that postmortem computed tomography (CT) scans are helpful in determining their causes of death.

Methods: The records of 50 consecutive, sudden, out-of-hospital CPA patients, who were conveyed to this facility

over six months, but who were not resuscitated successfully, were reviewed retrospectively. Medical records, chest and abdominal x-ray films, and electrocardiograms were examined if available. CT scans of head, chest, and abdomen were performed after the declaration of death.

Results: Six patients were excluded from the study for various reasons. Forty-four patients were examined using CT (age: 70.5 ± 11.2 years, 32 males and 12 females). Head CT was performed in 41 patients, chest in 33, and abdomen in 23. Definitive diagnoses were made by CT in nine patients (20.5%) including subarachnoid hemorrhage, aortic dissection, ruptured aortic aneurysm, or severe pneumonia. The suspected diagnosis of acute myocardial infarction for 12 patients (27.3%) was supported by calcifications in their coronary arteries. Three patients (6.8%) demonstrated cardiac tamponade, but its origin was not defined, whether ruptured aortic aneurysm or a ruptured cardiac ventricle by myocardial infarction. Sixteen patients (36.4%) were not diagnosed by CT, but six of them had limited information due to the absence of thoracic and abdominal CT.

Conclusion: Postmortem CT scan is informative in defining or suspecting the cause of death in unsuccessfully resuscitated, sudden, out-of-hospital CPA patients.

Keywords: cardiac arrest; etiology; computerized tomography; out-of-hospital; post-mortem

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Military Unit of the Hospital

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Israel presently is preparing itself for the event of chemical warfare. Until 1991, decontamination teams were manned by pre-military youth, ages 16 to 18 years. During the Gulf War, due to the difficulty of the task, it was realized that the role must be filled by adults, and therefore soldiers were designated for these missions. In 1994, special military units were allocated, in order to serve as a contingency unit in each general hospital. The Assaf Harofeh military unit was formed in 1996.

Our hospital is prepared to treat 300 chemical warfare casualties in a mass casualty event. The military unit is made up of around 160 soldiers, as an integral unit of the hospital staff. The unit performs its roles specifically in the contaminated area, side-by-side with the hospital's civilian personnel, under the overall authority of the hospital directors. The roles of this unit are as follows:

1. Evacuation of casualties from the ambulances
2. Undressing and decontamination
3. Ventilating severe casualties
4. Stretcher bearers
5. Transfer of casualties to decontaminated area

The military commander of the unit acts under the direction of the Home Front Command, but receives professional orders and supervision from the hospital administration. Every year, the unit is trained in the hospital, and once every three years participates in an integrative drill simulating a chemical warfare scenario.

Conclusion: Without the integration of the military unit, the hospital would not be prepared for chemical warfare and would be unable to fulfill its goal of saving lives.

Keywords: ambulances; chemical warfare; civil-military; decontamination; drill; hospital; military; teams; transfer
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Management of Multiple Injuries in a Disaster

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I. Statistics of Disaster Medicine

A. Traffic Accidents: In recent years, worldwide, there have been 700,000 people killed and 1,500,000 injured annually. In the last five years in China, 1,253,768 persons suffered traffic accidents; of those, 264,933 died.

B. Other Disasters in China in Recent Years:

1. The economic loss caused by calamities is about \$18,800 per square meter of coastal area.
2. Earthquake: From 1950 to 1990, there were 22 earthquakes. In 1976, the shock of Tang Shan Earthquake was 7.8 magnitude, with 242,000 persons killed by the quake.
3. Flood: Rainstorms have caused serious floods in the low-lying areas. The China Reduced Disaster Newspaper showed that floods caused economic losses of about \$228 million annually.
4. Typhoon: In 1982-1990, 4,167 persons were killed, 2,550,189 houses were damaged, and 14,345 ships were overturned by typhoons.

II. Disasters in China have increased year by year. In Guangdong Province, the harvested fields were damaged: 181,424 hectares by floods and/or typhoons and/or dry spells in 1960s.

III. There are three main Groups for Deaths of the Multiple Wounded by Time Post-event.

1. 50% die in a few seconds or few minutes of the trauma. The cause of these deaths are injuries to the heart, aorta, major vessels, and/or lacerations of the brain, brainstem, and spinal cord, etc.
2. 30% of the wounded die within 2-3 hours, of subdural hematoma, hemothorax, hepatic and/or splenic rupture, open femoral fracture combined with multiple injuries, etc.
3. The 20% of patients with multiple injuries die within a few days or few weeks after the injuries; the main cause is infection.

IV. Management of Patients with Multiple Injuries in Disaster

1. Establishing the Unity Emergency Alarm Number
2. Establishing a modern communication system
3. Triage and first aid for the casualties in the calamitous area
4. Management of the mass multiple-wounded

Keywords: causes; characteristics; China; costs; deaths; disasters; drought; earthquakes; events; floods; injuries; management; rain storms; statistics; typhoons
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Treatment of Critical Multiple Traumatic Wounds Complicated with MOF, Septic OPSI

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Owing to improvement of prehospital first aid, 1,446 sorties of ambulances were made, and 110,889 persons requiring first aid were transported to the Shanghai First Aid Central Station (SFACS) during 1999. The number of persons wounded by traffic accidents and other events was 26,681 (24% of total). Within the past year, the intensive care unit (ICU) received 15 of the patients with multiple traumatic wounds; among these were 11 cases with wounds to three organs. Of the 15, 11 persons recovered and 4 died. The curative care of the wounded consisted of early careful physical examination and ICU monitoring.

1. Hemodynamic monitoring — can reflect the cardiac function, to distinguish the character of pulmonary edema and continuously display cardiac functions associated with septic shock. The monitor can connect with the ventilator to show the parameter of lung function.

2. Acute renal failure — continuous arterial-venous filtration that is effective in removing overhydration and medium small molecule substances from the blood.

3. Anticoagulant therapy — The multiple trauma and the MOF-wounded usually receive massive transfusions and suffer from disseminated intravascular coagulopathy (DIC) with the result of blood coagulation disturbance. Then it is necessary to examine the mechanisms of blood coagulation and DIC. If it is found to have delayed prothrombin time and trombin time, a prothrombin complex must be used; delayed KPTT, then cryoprecipitate and FEP must be used. If the diagnosis of DIC is proved, heparin and other antihemolytic substance can be used.

4. Overwhelming Post-Splenectomy Infection — The new problem about immunology. If it is possible, the wounded must be examined for some immunodeficiency and receive relative treatment.

5. Establish ICU — To manage the critical multiple injuries that not only decrease the mortality, but also can represent the level to traumatic treatment.

Keywords: anticoagulants; disseminated intravascular coagulopathy (DIC); immunology; infection; intensive care unit (ICU); mortality; multiple injuries; prehospital; trauma; treatment

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One Year Georgian Experience of Nitrous Oxide Usage in Prehospital Care and Analgesia during Transportation

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The mixture of oxygen and nitrous oxide was used in 29 patients transported by the Center of Disaster and Emergency Medicine during emergencies and disasters in 2001. In all 29 patients, the pain was controlled: 10 had cardiogenic shock, eight had intracranial injuries, seven suffered gunshot wounds, and 4 had burns of different degrees. The Center of Disaster and Emergency Medicine participated in the medical response to four disasters in