

patients who could be saved, regardless of whether the core medical institutes are located within or outside the destroyed area. It is very crucial to pick up such red-tagged patients properly and to transport them to the other core medical institutes in intact areas beyond the boundary of local governments.

The medical operations in a disaster are a part of the total disaster plan developed by each Prefectural government. After the Great Hanshin-Awaji earthquake, about 500 hospitals were chosen as core medical institutes for disaster. Each core medical institute must satisfy several requirements: 1) capable to provide advanced medical services for the multiple severely injured patients; 2) capable to function as the headquarters equipped with a medical information system in disaster and emergency situations; 3) facilities to transport patients beyond the border of the local governments, such as dispatched doctors, emergency automobiles, heliport, etc.; and 4) enough personnel to dispatch self-contained medical service teams.

In order to utilize all medical institutions in the damaged area and make them fully functional in a disaster situation, several mutual-aid arrangements for health and medical assistance within a Prefecture or between neighboring Prefectures, or on a nation-wide scale have been established following the Great Hanshin-Awaji earthquake. Every effort has been made to make such mutual-aid arrangements work properly through the use of drills and simulations. Every core hospital and other hospitals have come to prepare their own disaster manual.

In this panel discussion, we will demonstrate the policies and the measures prepared in Osaka Prefecture.
Keywords: core hospitals; disaster; hospitals; mutual-aid; plans; policies; preparedness; transport; triage

PN2-4

Overview of Bio-Psycho-Social Problems after the Hanshin-Awaji Earthquake: Report from Kobe University School of Medicine

Naotaka Shinfuku

International Center for Medical Research, Kobe University School of Medicine, Kobe, Japan

Kobe University School of Medicine is situated at the center of the disaster area where more than 5,500 people died in January 1995. Therefore, the affiliated University Hospital played a vital role for medical services for the victims from the beginning of the disaster. Also, the hospital received patients with a variety of stress-related health problems after the Earthquake. At the same time, the Medical School organized systematic research on the various medical and health problems among victims.

Research works carried out at the Kobe University School of Medicine on the Earthquake victims has ranged widely from forensic analysis of the dead, crush syndromes, effects of stress on cardiovascular and digestive systems, psychological problems, care systems for the victims, etc. The research project involved more than 100

doctors and researchers. This paper reviews a wide range of bio-psycho-social impacts of the disaster to the victims, and analyses the longitudinal changes in health problems. Special attention should be directed to the psychological and psychiatric aspects. Also, some medical problems still are continuing even four years after the Earthquake.

Keywords: crush injury; earthquake; forensics; health status; research; residuals; stress

PN2-5

The Hanshin-Awaji Earthquake and Dental Care

Yoshihiro Tanaka, DDS, PhD; Mineo Kawai, DDS, PhD;

Ryohei Adachi, DDS, PhD;

Masahiro Furutani, DDS, PhD;

Masanobu Ohnishi, DDS, PhD;

Kiyoshi Tatemichi, MD, PhD

Kobe City General Hospital, Kobe City, Hyogo, Japan

This paper will summarize the dental and oral conditions caused by the Hanshin-Awaji Earthquake, and will describe the damage suffered by dental care facilities and instruments.

Since the Earthquake occurred before dawn, 66.3% of the persons who died in Kobe were crushed by their houses. There were very few cases of maxillofacial trauma; only 28 patients with maxillofacial trauma were examined by personnel from the Departments of Dentistry and Maxillofacial Surgery at seven hospitals in Kobe City. Only four cases of fractures of the jaw were reported.

Dental care facilities in Kobe City also were severely damaged. As of 23 January, one week after the Earthquake, only 183 of the 797 dental care facilities in Kobe City had reopened. The major factors responsible for the delayed resumption of dental-care services were the unavailability of water and gas for one to three months and the high volumes of water required by most dental instruments.

A total of 560 shelters, which housed 210,000 persons who had lost their houses, were established in Kobe at the time of the Hanshin-Awaji Earthquake. Dental care was provided through the joint efforts of the Hyogo Dental Association, Kobe Dental Association, and Hyogo Society of Hospital Dentistry.

Temporary clinics were established at 10 sites in Kobe City, starting on 20 January. A total of 2,344 patients underwent dental examinations. A dental examination bus was used for the temporary clinics. In addition, 18 dental care groups, consisting of volunteers and of health-care staff from schools of dentistry of local universities, visited and treated a total of 1,925 patients at 181 sites.

There were 1,043 cases of pulpitis and dental infections. There were 1,834 cases of caries and periodontitis, and the number of patients examined peaked about 2 weeks after the earthquake. There were 1,108 cases of denture loss or breakage and displacement of prostheses of fillings.

lishing a support system to provide appropriate emergency dental care to victims of large-scale, natural disasters in cities.

Keywords: dental care; dentists; disaster; earthquake; infections; maxillofacial trauma; mobile offices; periodontitis; pulpitis; support systems

General Session VIII

Flood Disasters

Tuesday, 11, May, 8:00–9:00 hours

Chair: K. Joanne McGlown, Tadashi Yashuda

G-38

Consideration of Social Property on the Disaster Medicine of Flood and Waterlogging

Xu-Lungong

Children's Hospital Affiliated to Suzhou Medical College, Jiangsu, China

Natural disasters such as floods, droughts, earthquakes, hailstones, storms, forest fires, and so on usually cause great destruction that affects the living of humankind and social development. The floods of 1991 in the low reach, and in 1998 in the upper and middle reaches of Yangtze River as well as in Northeast China's Nenjiang and Songhua Rivers, have resulted in huge, direct economic losses, personnel injuries, and deaths. On the one hand, implementation of Disaster Medicine can reduce effectively the mortality rate of victims in the flooded areas. On the other hand, Disaster Medicine not only consists of the performance of cardiopulmonary resuscitation (CPR) on the site, but also to provide for disaster relief under strong, organized leadership, unified command, and effective coordination. From the experience of the battle against floods in 1998, the authors believe that the following essential factors must be observed in order to strive for victory against floods:

- 1) Establish a lead group that consists of health administration, the departments of medicine, and the Logistic Health Unit of the related military command that is responsible for implementation of first aid on-site, hygiene, medical supplies, patient transportation, etc.;
- 2) Foster a dedicated spirit among medical team members and other volunteers, and to assume the responsibility for the life and the belongings of victims;
- 3) Popularize training in CPR methods, and raise the consciousness of self- and mutual-aid in the whole population;
- 4) Conduct a series of hygiene measures as early as possible in order to prevent epidemic outbreaks; and
- 5) Guarantee communications and logistic support.

In summary, we should emphasize the social property of Disaster Medicine, and organize and mobilize every effort into the action of disaster relief.

Keywords: cardiopulmonary resuscitation (CPR); communications; coordination; disaster; disaster medicine; first aid; epidemics; floods; lead agency; logistic health units; mutual aid; organization; supplies; transportation

G-39

A Clinical Analysis of Hospitalized Patients during the Flood in Uijungbu City, Korea

Eunyoung Rue, MD; Kim Sekyung, MD, FACS

Department of Emergency Medicine, Uijungbu St. Mary's Hospital, The Catholic University of Korea, Korea

Background: Flood is the most common natural disaster in Korea, but few descriptions about the flood-related injury, illness, and medical requirements are noted. We will describe the type of medical care provided to a community in the chaos caused by flood.

Methods: Five emergency physicians reviewed the medical records of and interviewed the patients who were admitted from 05 August to 14 August 1998 in eight hospitals in Uijungbu City.

Results: This study involved 102 patients, 53 male and 49 women, age from one to eighty-two years. Most of the patients had minor problems, and <3% of them required critical care. Based on the principal diagnosis, the proportion of patients who were admitted was as follows: 1) lacerations, 39.2%; 2) contusions, 22.5%; 3) fractures, 13.7%; 4) infectious disease, 7.8%; 5) ligament rupture, 7.8%; 6) aggravation of chronic illness, 5.9%; 7) dermatitis, 2.0%; and 8) traumatic hyphema, 1.0%. The lacerations occurred in the: 1) foot, 37.9%; 2) lower leg, 27.0%; 3) thigh, 16.2%; 4) hand, 10.8%; and 5) head, 8.1%. The Achilles tendon was the most frequently injured ligament (62.5%), followed by the hand, 25%, and the knee, 12.5%. Of the flood-related laceration patients, 67.5% had progressed to cellulitis, especially sutured wounds, and a patient developed typical tetanus. Of the hospitalized patients, two patients were suspected to have developed post-traumatic stress disorder (PTSD).

Conclusion: Most of the flood-related illnesses and injuries were not critical and education about injury prevention such as wearing of shoes and clothes in the submerged area might lower the incidence of accidents. Even simple lacerated wounds should be irrigated and debrided thoroughly and left for delayed closure with tetanus immunization. Although of low incidence, psychological health support also is needed.

Keywords: floods; hospitals; illnesses; incidence; injuries; Korea; post-traumatic stress disorder (PTSD)

G-40

Facing Disasters: Hurricane Mitch: The Costa Rican Experience

Daniel K. Rodriguez, MD;¹ Mario Saenz, MD²

1. Department of Medicine, Hospital Calderón Guardia, University of Costa Rica, Sabanilla, Costa Rica

2. Department of Surgery, Hospital Calderón Guardia, National Emergency Commission, Costa Rica

Costa Rica is located in the narrow Central American isthmus and was indirectly affected by Hurricane Mitch