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## 2

**The Great Hanshin-Awaji Earthquake and Coronary Artery Disease**

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On January 17, 1995, the great Hanshin-Awaji earthquake hit Kobe, killing 6433 people. Since natural disaster may be associated with increased risk of heart attack, we investigated the influence of the great Hanshin-Awaji earthquake on the status of coronary artery disease. First, we assessed patients who admitted to 10 hospitals located in the Hanshin-Awaji area due to acute coronary syndrome (ACS). During the first 2 weeks after the earthquake, the number of ACS patients doubled compared with that in the corresponding period in 1994. During the next 2 weeks, there still was a tendency of increased occurrence of ACS. Thereafter, ACS patient's number returned to the level comparable to that in usual year. Next we investigated the influence of the earthquake on pre-existed coronary artery disease. We obtained information by questionnaires from 826 patients with coronary artery disease who had admitted to Kobe University Hospital during 1989-1994. There was a worsening of cardiac symptom in 15.7% of the patients; most of the worsening occurred within 1 week after the earthquake and was related to the severity of individual's house damage. Interestingly there was an increased incidence of patients with deep negative T wave without Q wave after the earthquake. This ECG abnormality likely reflected the abnormal cardiac sympathetic activity. It seemed that not only physical stress but also mental stress after the earthquake resulted in the increased risk of ACS and worsening of pre-existed coronary heart disease.

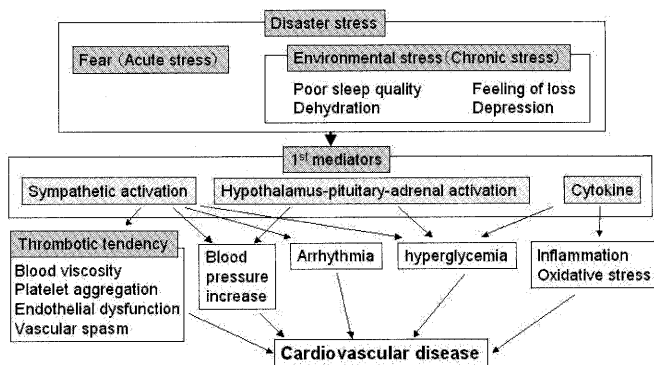
## 3

**Mechanism of disaster-induced potentiation of cardiovascular risk: Evidences from The Hanshin-Awaji Earthquake**

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There is growing evidence that psychological stress contributes to cardiovascular disease. In proportion to the damage of the disaster, the number of cardiovascular events increases in a high-risk older population. Typical increase was found during nighttime, suggesting that poor sleep quality might affect disaster-induced cardiovascular events. Acute stress can trigger cardiovascular events predominantly through sympathetic nervous activation and potentiation of acute risk factors (blood pressure increase, endothelial cell dysfunction, increased blood viscosity, and platelet and hemostatic activation). Chronic stress by environmental change contributes to the atherosclerotic process through the neuroendocrine and immune systems (sympathetic nervous system and hypothalamus-pituitary-adrenal axis) and related chronic risk factors (metabolic syndrome, hypertension, diabetes, and hyperlipidemia). In this Jichi Medical School (JMS) Proposal 2004, we propose the practical management of disaster-induced risk factor stress, and hope immediate management could achieve effective primary and secondary prevention for cardiovascular disease in disaster. Reference: Kario K, Shimada K, Takaku F. Management of cardiovascular risk in disaster: Jichi Medical School (JMS) Proposal 2004. Japan Medical Association Journal 2005;48:363-76.

**Mechanism of Disaster-induced Cardiovascular Disease**

## 4

**Acute cardiovascular events triggered by Niigata-Chuetsu earthquake**

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Earthquake and natural disaster cause catastrophic cardiovascular events, such as acute myocardial infarction and sudden death, via emotional stress. A great earthquake magnitude 6.8 on Richter scale (grade 7 of seismic intensity) occurred in Niigata Chuetsu district at 5:56 p.m. on October 23, 2004. Subsequently, about 90 aftershocks of greater than magnitude 4.0 occurred during the following weeks including three strong earthquakes over magnitude 6.0. We retrospectively investigated the incidence of acute coronary syndrome, Takotsubo cardiomyopathy and sudden death triggered by the earthquake. The number of total cardiovascular events markedly increased after the earthquake with a daily median of 6 cases compared with median of 2 cases in the control 20 weeks. There was no statistical difference in the incidence of acute coronary syndrome after the earthquake compared with the control periods. Takotsubo cardiomyopathy dramatically increased to 25 cases during 4 weeks after the earthquake compared with only 2 cases in the control 20 weeks. Twenty-four cases were women, and the mean age was 71.0 years (range 49-83 years). The incidence of sudden death also increased in the week after the earthquake, with a daily median of 3 cases compared with median of 1 case in the prior 4 weeks. The increase of sudden death was disproportionately high than the increase of acute coronary syndrome. Takotsubo cardiomyopathy may be one of the causal disorders of sudden death triggered by the great disaster.

## 5

**Emergency System for Circulatory Diseases During Disasters and Associated Problems From the Standpoint of Emergency Physicians**

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Providing the best treatment to the greatest number of disaster victims and returning the maximum number to their former lives is the goal of disaster medicine. When attempting to do so, it seems extremely difficult not only to identify exogenous diseases, as typified by trauma, but to avoid overlooking endogenous diseases, such as heart disease. The disaster medicine procedure consists of four phases: search and rescue, triage, transportation, and treatment. Search and rescue is medicine at the scene, as typified by confined space medicine, and because of providing it under an inadequate care system, along with the subsequent triage, the burden and responsibility of the physician at the scene is great. Making it possible to dispatch appropriate physicians according to the type and circumstances of the disaster and daily education of the general public, paramedic teams, etc., seem to be future tasks. In regard to the remaining two phases, the importance of air transportation was recognized at the time of the Great Hanshin-Awaji Earthquake, and it is linked to treatment in places where medical care systems have been set up. It has now been greatly improved, and a great deal can be expected in this phase in the future. We report on the above on the basis of our experience.

## 6

**Emergency cardiovascular care for out-of-hospital cardiac arrest after natural disaster**

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Recent reports showed that the incidence of acute myocardial infarction increased after natural disaster. Fatality of acute myocardial infarction is still very high and more than half of acute phase of death is out-of-hospital cardiac arrests (OHCA). Therefore, for cardiologists the main focus for the managements of acute myocardial infarction should be on the prehospital phase. We evaluated a population-based cohort study for OHCA of cardiac etiology last 6 years in Osaka Prefecture using the Utstein style. One-year survival proportion of patients with OHCA gradually increased over time with the improvement of the chain of survival; however, it is still very low level of 4%. To improve the chain-of-survival system in Japan, we have established AHA BLS and ACLS