

out-of-hospital cardiac arrests in the northern part of the Osaka prefecture, using the Utstein style.

**Design:** Prospective population-based cohort study.

**Setting:** An urban area surrounding Osaka City (population 1,680,000, area 339 km<sup>2</sup>).

**Patients:** A series of out-of-hospital cardiac arrests between 01 November 1996 and 30 April 1998.

**Results:** A total of 1,211 patients were found to have neither palpable pulse nor independent respiration. The overall incidence of out-of-hospital cardiac arrest was 48.6/100,000 inhabitants/year. A total of 972 (80%) were attempted resuscitations. The cause of the cardiac arrest was cardiac in 49% and non-cardiac in 51%. The number of bystanders that witnessed the cardiac arrests of cardiac origin was 178 (18%). Ventricular fibrillation was the initial rhythm in 20% of the bystander-witnessed cardiac arrests of cardiac origin. 26% of patients received bystander-initiated cardiopulmonary resuscitation. The mean time intervals from the receipt of the call to the arrival of a first response, advanced-life-support unit and arrival at a hospital were 5.8 minutes and 27.0 minutes, respectively. When the cardiac arrest was witnessed by bystanders and was of cardiac origin (178 cases), 50 (28%) were hospitalized, and three (2%) were discharged alive. When cardiac arrest was witnessed by bystanders and was of non-cardiac origin (171 cases), 71 (42%) were hospitalized and two (1%) were discharged alive. When cardiac arrest was witnessed by Emergency Medical Services (EMS) personnel and was of cardiac origin (41 cases), 19 (46%) were hospitalized and five (12%) were discharged alive.

**Conclusions:** This discussion will compare these results with those published reports from other EMS systems.

**Keywords:** cardiac arrests; incidence; out-of-hospital; prehospital; Osaka; Utstein style

## G-72

### Retrospective Analysis of Cardiac Arrest for the Last 15 Years in the King Khalid University Hospital (KKUH), Riyadh, Saudi Arabia

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**Background:** Cardiopulmonary Resuscitation (CPR) was introduced to Saudi Arabia in 1984 after the first CPR course organized by the American Heart Association (AHA) was conducted. In 1987, the Saudi Heart Association and CPR Committee were established and became the sole responsible agency for CPR activities in the Kingdom of Saudi Arabia.

**Objective:** to review and analyze the outcome of CPR activities and the factors affecting that outcome, and to identify its progress over the last 15 years at the King Khalid University Hospital (KKUH)

**Methods:** The policy and procedure for CPR was revised in 1988 and in 1991. Accordingly, the period of review was divided into four stages for review: Stage I:

before 1983; Stage II: 1983–1987; Stage III: 1988–1991; and Stage IV: 1992–1997. The records of 3,613 patients who underwent CPR during this 15 year period were reviewed retrospectively, and the following data were abstracted: 1) type of dysrhythmia at the time of the arrest; 2) drugs used; 3) DC countershocks applied; 4) condition of the patient at time of the arrest (monitors used, intubation, mechanical ventilation at the time of the arrest); 6) response time of the CPR team to the patient; and 7) outcome.

**Results:** There was a progressive, general improvement in outcome over the four stages. Most of the cardiac arrest occurred in the general wards and critical care units. They mainly were due to cardiac and/or respiratory causes. The overall attendance of the members of the CPR team improved across the stages with excellent responses in Stage IV (9.7% to 98.8%). The most common dysrhythmias were asystole and bradycardia (74%). Most of the patients, who arrested in Stage IV, had an intravenous line inserted during the time of the arrest (69.2%). Adrenaline and atropine were the drugs most frequently used in each of four Stages. The use of bicarbonate and calcium solutions decreased across the successive stages. The use of DC countershocks blindly and without the prior use of drugs increase over the Stages and paralleled an increased in the effectiveness of the DC shocks.

**Conclusion:** Based on these data, recommendations for further improvements in the outcome of CPR in KKUH include: 1) inclusion of a senior medical member in the CPR team; 2) emphasizing the blind use of DC countershocks; 3) avoiding the use of bicarbonate and calcium solution; and 4) frequent revisions of the policy and procedure for CPR at KKUH.

**Keywords:** arrest; cardiac; cardiopulmonary pulmonary resuscitation (CPR); countershocks; dysrhythmias; outcome; pharmacological interventions; process; review

## G-73

### Factors Influencing Survival after Out-of-Hospital Ventricular Fibrillation (OHVF) Cardiac Arrest in Japan

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**Introduction:** In 1991, a new Emergency Medical Services (EMS) system was introduced in which ambulance crews with special training were certified to provide defibrillation using a semiautomatic defibrillator for treatment of patients with ventricular fibrillation in the out-of hospital setting (OHVF). According to the national report of the Japanese Ministry of Home Affairs, 1,918 cases of OHVF were treated with defibrillation by ambulance crews in 1996, and the number has been increasing by approximately 20% every year.

However, there is no national study regarding the outcomes from OHVF. Therefore, this study was undertaken to determine the outcomes of OHVF cardiac arrest patients, and to analyze factors that influenced the survival of OHVF patients in the Japanese prehospital setting.

**Methods:** A survey was distributed to 311 fire defense headquarters throughout the country, and it was analyzed to determine factors that could have influenced the outcomes. A retrospective review of OHVF cardiac arrests from April 1996 through March 1997 was performed. Data obtained from the resuscitation records were evaluated statistically.

**Results:** 224 fire defense headquarters responded, and data from 643 cases of OHVF on the scene were: Cardiac etiology; 440 (68.4%); 482 (74.9%) were male; average age = 61.5 ±16.2 years; witnessed arrests = 497 (77.3%); bystander CPR = 190 (29.5%); collapse to ambulance arrival interval = 8.8 ±6.5 minutes; call to ambulance arrival interval = 6.0 ±3.6 minutes; call to first shock interval = 19.1 ±10.3 minutes; admitted alive = 186 (28.9%); one month survival = 80 (12.4%), and survival to hospital discharge = 62 (9.6%). Factors that influenced survival to hospital discharge were cardiac etiology ( $p < 0.0001$ ), age ( $p < 0.0001$ ), call to first shock interval ( $p = 0.0031$ ), witnessed arrest ( $p = 0.0069$ ), and call to ambulance arrival interval ( $p = 0.011$ ).

**Conclusion:** The call to first shock interval was considerably longer than in other reports. This significant delay in defibrillation seems to explain poor survival to discharge of OHVF in this study. Under the current law, the use of a semiautomatic defibrillator by ambulance crews requires permission by physicians via radio. However, this system appears to have a tremendous drawback in saving OHVF patients on the verge of death, because time delays are inevitable under the circumstances in which medical control is required in order to defibrillate. In order to improve survival of OHVF patients in Japan, a revised program in which defibrillation can be performed without any delay, should be implemented.

**Keywords:** ambulance; Japan; defibrillation; discharge; medical control; out-of-hospital; prehospital; survival; time intervals; ventricular fibrillation

#### G-74

##### Mass CPR Teaching as a Method of Instilling Confidence and Comfort in the Performance of CPR Skills

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**Introduction:** Mass CPR teaching is one way of increasing the number of people in a community who may be prepared to help persons in cardiac arrests.

**Methods:** A questionnaire survey was conducted during our first mass teaching CPR programme to 200 first-year university students. A total of 196 completed forms were received.

**Results:** One-hundred ninety-three respondents (98.5%) felt confident that they could perform CPR, 70 (37.5%) felt "very confident", and 123 (62.8%) felt "confident", 181 (92.3%) felt they would be "comfortable" to perform CPR in a real life situation, 29 (14.8%), "very comfortable"; and 152 (77.5%), "comfortable" after the two-hour training session.

Of the 196 respondents, 164 (83.7%) had heard of and/or witnessed CPR (H/W group) while the other 32 (16.3%) had not heard of nor witnessed it (NH & NW group) prior to entering university. In the H/W group ( $n = 164$ ); 162 (98.8%) felt confident, 60 (36.6%), "very confident"; and 102 (62.2%), "confident"; and 153 (93.3%) felt "comfortable" that they could perform CPR in a real life situation; 25 (15.2%), "very comfortable"; and 128 (78.1%), "comfortable". Whereas, in the NH & NW group ( $n = 32$ ), 31(96.8%) were confident; 10 (31.2%), "very confident"; and 21 (65.6%), "confident" and 28 (87.5 %) felt comfortable to perform real life CPR; 4 (12.5 %), "very comfortable"; and 24 (75 %), "comfortable".

**Conclusions:** From these results, mass CPR teaching seems to be an effective method for instilling confidence and comfort in CPR skill performance. Prior knowledge may be advantageous in achieving the above.

**Keywords:** CPR; CPR training; effectiveness; experience

#### G-75

##### Emergency Life-Guards in Japan Improve Outcome from Out-Of-Hospital Cardiopulmonary Arrest

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**Purpose:** The aim of this study was to evaluate the emergency medical service (EMS) concerning out-of-hospital cardiopulmonary arrest (oh-CPA) in Japan.

**Background:** Sudden cardiopulmonary arrest (CPA) patients in Tokorozawa City and the surrounding area (population, approximately one million) are transported to our hospital by Japanese EMS. In the past, ambulance personnel of Japan were permitted to perform only bag-valve mask ventilation and external chest compressions for CPA patients. However, since 1991 specifically trained ambulance personnel, emergency lifeguards (ELGs), have used defibrillators and intubation devices except for endotracheal tubes.

**Patients and Methods:** A total of 1,151 CPA cases were studied. These patients were transported to this hospital from 1981 to September 1998. Prognostic factors influencing the outcomes (1. Survival; 2. Good recovery) in CPA cases were evaluated using multivariate analysis (quantification theory type). These included: etiology 2) age; 3) gender; 4) witnessed arrest; 5) bystander CPR; 6) crew of EMS (ELG or not); 7) time interval from collapse to arrival; and 8) arrival status (CPA or oh-ROSC). Moreover, we examined the same factors in 235