Compression-Decompression (ACD)-CPR

T.S. Mutzbauer; W. Stahl; K.H. Lindner
Department of Anesthesiology and Critical Care Medicine, University of Ulm, Ulm, Germany

Objective: Different studies have demonstrated the respiratory effects associated with the use of the cardio-pump during ACD-CPR in animal models. There is no study, however, demonstrating beneficial ventilatory effects of this tool in humans with cardiac arrest. The aim of this evaluation was to measure tidal volumes applied by the cardio-pump as used by medical personnel experienced in conventional cardiopulmonary resuscitation (CCPR).

Materials and Methods: A 35 year-old normothermic male with a large posterior myocardial infarction underwent CCPR (38 minutes) followed by ACD-CPR (50 minutes) due to cardiac arrest. As resuscitative efforts remained unsuccessful, termination of the resuscitation was decided (total dose: 60 mg epinephrine). Minute volumes applied by the emergency physician and three EMTs during ACD-CPR were measured using a Draeger Oxylog 2000 in the CPAP mode (CPAP = 0), and the frequency of chest compressions was assessed using a Nellcor pulse oximeter. Shortly after the test, the patient showed return of spontaneous circulation (ROSC) and was transferred to the ICU. 50 minutes after ROSC, CCPR was continued for 30 minutes due to refractory pulseless electrical activity. Immediately after decision to stop CPR, two medical intensive care physicians and one ICU nurse continued with ACD-CPR. Minute volumes were measured with a Draeger Anemone volumeter. Additionally, arterial blood pressure during CCPR and ACD-CPR were recorded by a Siemens Sirecust 1281 Monitor via femoral artery catheter. All "rescuers" were blinded with respect to the measured parameters.

Results: The calculated median tidal volume was 143 ml (range 88 to 200 ml). Mean arterial blood pressures (BP) were 40 vs. 50.4 vs. 38.4 vs. 36 mmHg with CCPR vs. ACD-CPR.

	Minute Ventilation [l/min]	Tidal Volume [ml]	BP ACD [mmHg]	BP CCPR [mmHg]
EM physician	10	143		
EMT1	7	88		
EMT2	10	100		
EMT3	8	80		
ICU physician 1	7.6	200	70/40	60/30
ICU physician 2	9.6	160	49/30	60/36
ICU nurse	8	200	47/34	60/32

Discussion: Results indicate that at least a "median frequency ventilation" could be achieved by ACD-CPR. Some patients might benefit from ACD-CPR without additional ventilation, because ACD-CPR could induce sufficient brain perfusion and subsequently spontaneous ventilation leading to even larger tidal volumes, active compression-decompression CPR, ventilation, tidal volumes, and median frequency ventilation.

Key Words: active compression-decompression; cardiopulmonary resuscitation (CPR); ventilation

Prehospital Thoracotomy for Cardiac Arrest Due to Perforating Chest Wounds: Case Reports of Two Patients

T. Silfvast
Department of Anaesthesia, Helsinki University Hospital, Helsinki, Finland

Prehospital cardiac arrest due to trauma almost uniformly is fatal. In penetrating chest trauma, survival may be possible if emergency thoracotomy is rapidly performed. Two patients are described for whom emergency thoracotomy was performed at the site of the stabbing.

Patient 1, a 27-year-old male, was found unresponsive by the responding physician who staffed prehospital emergency unit (PECU), but the victim still had agonal breathing No pulses were palpable and the ECG showed pulseless electrical activity (PEA). Three stab wounds were found anteriorly in the chest, and two more in the neck. After intubation, a left thoracotomy was performed. The distended pericardium was opened, and the heart started beating when direct compressions were started. The patient then was transported to the hospital. In the operating room (OR), the left ventricle was found to be perforated antero-posteriorly. After suturing, profuse bleeding from the neck continued. The patient never achieved adequate blood pressure and died in the operating room.

Patient 2, a 24-year-old male, had one stab wound to the left of the sternum. On the arrival of the PECU, he suddenly became lifeless and the ECG showed PEA. Transportation time to hospital was estimated to be 18 minutes. A left thoracotomy was performed after intubation, and at pericardiotomy, a clot was removed and the heart spontaneously resumed beating. The patient was transported while the physician obstructed the cardiac wound with his finger. In the OR, the wound was sutured, and the patient subsequently made a complete recovery and was discharged to home intact.

Conclusion: It is concluded that prehospital thoracotomy may be lifesaving in selected trauma cases, especially if the lesions are expected to be few in number.

Key Words: cardiac arrest; prehospital; stabbing; thoracotomy; trauma

Evaluation of Nation-wide Education of Basic Life Support (BLS) in Japan

M. Aono, MD; S. Kawaguchi; MD; R. Tamai, RN, ELST; A. Taknabe, RN, ELST
Kanazawa Medical University, Uchinada Ishikawa-Ken, Japan

Introduction: In Japan, since 1994, all persons who would wish to acquire a driver's license at a driving school must participate in at least two hours of training in Basic Life Support (BLS). More than 250 million people get a driver's license every year which almost equals 2% of the total population of Japan. Therefore, the teaching of BLS and especially its evaluation, is quite important.

In order to evaluate the efficacy of this BLS training, a survey was conducted to evaluate, not the resuscitation skills, but the changes in attitude relative to the importance of BLS after completion of the training among the college students.

Methods: All the students at the Hokkaido College of High Technology participated in this survey. Several thousand students received questionnaires in the classroom and, following the instructions provided, they completed the survey.

Questions mainly queried: 1) the quality of the training; 2) the experience associated with witnessing a patient with cardiopulmonary arrest and what the rescuers did at the scene; and 3) if they thought it was necessary to try to improve their skills.

Participating students were categorized into three major groups according to their course of study: 1) medical; 2) non-medical; or 3) medically related.

Results and Discussion: All the data were analyzed in relation to age, gender, actual on-scene BLS experience, and the group to which they belong. The results will be discussed in detail.

Key Words: BLS; education of BLS; evaluation of BLS

Session 6A: Children and Disasters

Chairpersons:
A. Ammar (Saudi Arabia)
J. Bierens (The Netherlands)

Emergency Psychotherapeutic Assistance to Children in the Areas of Armed Conflicts in the Former USSR

Marina I. Berkovskaya; Sergei N. Enikolopov; Alexander N. Michailov
Compassion Center, Moscow, Russia

The Compassion Center is a Moscow-based, non-governmental, charitable organization with the goal to render medical, social, and psychological help to victims of organized violence. Its "Children of War and the XXI Century" Program seeks to provide emergency psychological assistance to child victims of armed conflicts.

During the period from 1993 to 1997, a Compassion team, that included three psychologists, worked in Nagorno-Karabakh (1993–1994), Georgia, Abkhazia (1994–1995), Chechnya, Ingushetia, North Ossctia, Dagestan (1995–1997). During this period, 1,197 children and teenagers at the age from 5 to 16 years and 230 adults were examined. A total of 1,724 clients received psychotherapeutic assistance.

For evaluation, we used a set of non-verbal, projective tests, and short questionnaires to identify war-related stress disorders. For psychotherapy, we used short and mid-term psychological interventions.

Among our clients, both children and adults, the main stressogenic themes were as follows: loss of relatives; loss of home; anticipation of new losses and continuing or renewing of war; cruelty towards the clients himself/herself; scenes of cruelty; murders, deaths, war-ravaged buildings etc.; and helplessness, hopelessness, impossibility to develop plans for future.

During acute period of trauma, practically all children manifested some of the war-related stress disorders, such as sleeping disorders, night mares, phobias, flash backs, anxiety, apathy, depressive symptoms, irritation, somatic symptoms. Without treatment during postponed period, they also developed such serious psychosomatic and psychological disorders as ticks, enuresis, stammering, vegeto-vascular dystonia, behavioral deviations, high level of hostility and aggressiveness, decrease of cognitive abilities, and maladaption.

Our experience shows that during the acute period of trauma as the war continues or immediately after it stops, short- and mid-term interventions can be applied to large numbers of clients in a short period of time to decrease the amount of psychological damage the children suffer from. During the postponed period, it is necessary to apply a complex system of psycho-social rehabilitation, that requires much more human and material resources.

Key Words: armed conflicts; children; emergency psychotherapeutic assistance; post-traumatic stress disorder; war-related stress disorders

Database of Disabled Children Injured in Disasters

B.A. Kobrinsky
Research Institute of Pediatrics and Child Surgery, Moscow, Russia

The disorganization of the structure and functions of health services and social security systems during existing major disasters now are complicated further with migrations of the affected population. This has resulted in a breakdown of the strict succession of the medical services and of the recording of medical data.

The Russian Database for Disabled Children receives information about children who have been injured in disasters and who are destined for Centers for Disaster Medicine. At present, the database is programmed for use at the health services and social security agencies. An electronic analogue of the medical card of the patient includes: 1) personal particulars for a child; 2) information about his/her parents, near relations, or tutors; 3) a life anamnesis (medical history); 4) diagnoses; 5) information about the stages of treatment; 6) disability; and 7) the need for rehabilitation.

The database is used for: a) decision support about the size and a period of rehabilitation for the disabled children who received injuries at different disasters; b) improvement in the registration process; and c) the rational organization of the stages of the medical and a social measures being used. The database also includes: 1) an estimation of function and pathologic changes (in accordance with International Classification of Impairment, Disabilities, and Handicaps) that give the rights for disabled; 2) an analysis of the numbers and structure of the disabled children, including receipt of efficient dates; 3) control of rehabilitation for different stages of care; 4) an estimation of a level of restriction; 5)