

0870**SPECIALIZED MEDICAL CARE IN MOUNTAIN RESCUE: AN ANALYSIS OF THE CURRENT SITUATION IN THE AUTONOMOUS COMMUNITY OF CANTABRIA (SPAIN)**

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INTRODUCTION. The recent growth of mountain sports in Spain has led to an increase of incidents every year. Traditionally, rescues have been carried out by multidisciplinary first aid teams with different medical skills, resources and equipment. In the field of pre-hospital emergencies, the idea of moving patients from the incident scenario to medical assistance facilities (*scoop and run*) has been replaced by in situ health assistance. This new approach has been developed under different conditions depending on the autonomous community, especially regarding mountain incidents. In situ health care often means that health (rescue) teams have to work in hostile and hazardous environments, not always easily accessible. Advanced technical, physical and psychological training is needed in order to allow for a perfect integration of health professionals into mountain rescue teams.

OBJECTIVES. The main objective of this study is to assess the current situation of medicalization in mountain rescue teams in Cantabria and to determine the need of specialized health professionals in those teams

METHODS. An ecological research survey was developed. All mountain rescues that took place in Cantabria during 2008–2009 were studied. Information was collected from official data coming up from secondary sources.

RESULTS. Eighty-six injured subjects rescued in Cantabria within the study period were analyzed. In 64% of these, no specialized health professional was present. In situ health care was provided to 13% of the rescued subjects and 31.4% injured individuals needed first aid help. No health professional was present when mountain conditions were difficult. Rescues (70%) and patient transfers (60%) were mainly undertaken by the Grupo de Rescate Especial de Intervención en Montaña (GREIM) (70%), a rescue team specialized in mountain incidents with no health professional among its staff. Incidents were mainly caused by falls (33%) and losses (33%), followed by lack of skill and/or lack of appropriate material (16%). 15% of the injuries were due to dehydration, hypothermia, and exhaustion, 11% due to fractures in low extremities, 11% to sprain and contusions, and 6% of the injured resulted in deaths

CONCLUSIONS. In the Autonomous Community of Cantabria, a high percentage of mountain casualties do not receive in situ health care. Additionally, in a relevant percent of incidents no health care is provided during the patients' transfer to health facilities. Findings from this study highlight the need of medical teams specially trained in mountain rescue. We consider that the public professional model should include the medicalization of mountain rescue services. This approach has already been developed in other autonomous communities for several years and the characteristics of our community are suitable for adopting it.

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0871**SPIRAL CT FOR DIAGNOSIS OF PULMONARY EMBOLISM**

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OBJECTIVE. 1. To assess the role of spiral CT in diagnosis of pulmonary embolism. 2. Show the relation between presenting symptoms, and severity of pulmonary embolism. 3. To determine Prognosis and outcome of pulmonary embolism.

METHODS. During the period from August 2007 to January 2009 151 patients with clinically suspected pulmonary embolism underwent complete history taken, physical examination chest X-ray, ECG, arterial blood gases analysis spiral CT chest, Echocardiography, and perfusion lung scan (in patients with normal spiral CT chest with high clinical suspicion of pulmonary embolism).

RESULTS. 1. The most common risk factors for pulmonary embolism were obesity, bed ridden, vasculitis, trauma, and in 4.6% there was no apparent risk factor. The most common presenting symptom was dyspnea in 43.1%, combination of cough hemoptysis and dyspnea in 25.8%, chest pain and cough in 18.54% and syncope was in 12.58%. Sign of pulmonary embolism included, tachycardia in 58.9%, hypotension (BP less than 90/60 mmHg) in 13.25%, fever and tachycardia in 8.6%. Sign of deep venous thrombosis was present only in 93 patients (61.58%) which included swelling in 78 patients (51.7%) and leg pain in 15 patients 9.9%. 2. In patients with pulmonary embolism, ECG was normal in 12.8%, sinus tachycardia in 58.11%, S1Q3T3 pattern in 19.65% and right bundle branch block in 9.7%. 3. Chest radiography was normal in 17.94%, pleural effusion in 52.9%, pulmonary infarction in 13.67% and segmental atelectasis in 15.38%. 4. D-dimer was positive in 94% and negative in 6%. 5. Lower limbs duplex ultrasound was normal in 29% and DVT in 71%. 6. Echocardiography was normal in 29%, right ventricular dilatation in 38.46%, main pulmonary artery and right ventricular dilatation in 28.2% and right atrial thrombus in 4.2%. 7. Spiral CT was normal in 4.27% saddle shape embolism in 4.27%, unilateral lobar branches filling defect in 35.8%, bilateral lobar branches filling defect in 15.38%, segmental branches filling defect in 23.9%, and sub segmental branches filling defect in 16.23%. 8. In 39 patients with normal CTPA, perfusion lung scan was done which showed non-diagnostic in 34 (87.17%) patients (with normal D-dimer and normal lower limb duplex) and high probability in 5 (12.83) patients with positive D-dimer, so consider as pulmonary embolism. Mortality rate in our study was 4.27%

CONCLUSION: Our finding indicates that spiral CT pulmonary angiography, D-dimer and duplex lower limb ultrasound can diagnosed or exclude pulmonary embolism in 146 of 151 patients (96.6%) without need for pulmonary angiography. So spiral CT can be use as first step in-patients with suspected pulmonary embolism.

0872**PROGNOSTIC FACTORS AND DETERMINANTS OF MORTALITY IN ABDOMINAL TRAUMA**

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INTRODUCTION. In abdominal trauma patients there is often a delayed diagnosis. Conservative management is controversial and inappropriate choice of treatment is associated with increased mortality.

OBJECTIVES. Evaluation of outcome in patients with abdominal trauma and predictors of mortality.

METHODS. Retrospective study of patients with abdominal trauma admitted to our ICU from January 2004–December 2009. We collected epidemiological data, analytical parameters, conservative or surgical management, complications and severity scores: ISS, RTS, APACHE II. T Student to compare means, and Chi square and OR with 95% for qualitative variables. ROC curves to determine diagnostic accuracy of the variables to predict mortality. Logistic regression analysis to determine variables associated with mortality. Statistically significant $p < 0.05$.

RESULTS. 209 patients were included. Mean age was 18.5 ± 40.9 . 79.4% were men. The scores were: ISS 34.5 RTS 10.1 APACHE II 14.9. The most frequently affected organ was spleen (45.9%). There were thoracic injuries associated in 61.7%, and TBI in 38.8%. Mean stay in ICU was 12.5 and hospital was 39.8. Overall mortality was 6.2%. Univariate analysis of variables associated with mortality found differences in age (survivors 39.9 vs. dead 55.8, $p < 0.00$), GCS (13.7 vs. 8.4 $p < 0.01$), APACHE II (14.3 vs. 23.5 $p < 0.00$), ISS (32.9 vs. 56.7 $p < 0.002$) and RTS (10.3 vs. 7.5 $p < 0.007$). The best predictor of mortality is RTS (Area under the curve (AUC): 0.80). In analytic parameters we found: hematocrit 24 h ($30.3 \text{ vs } 26.1$ $p < 0.001$), Hemoglobin (Hb) 24 h ($10.5 \text{ vs } 8.7$ $p < 0.00$), initial pH (7.3 vs. 7.2 $p < 0.006$), initial base deficit (BD) (3.9 vs. 8.6 $p < 0.002$). The hospital stay is different (41.5 vs. 14.9 $p < 0.00$). The best analytical predictor of mortality was Hb 24 h (AUC 0.8). Association was found with the presence TBI (OR=19.9, 2.5–157.6) and chest trauma (OR=7.4, 0.9–58.4). There was association between mortality and the use of amines (OR=30.5, 3.9–240.5), mechanical ventilation (OR=14.6, 1.9–114.4) and transfusion (OR=5.1, 1.1–23.7). We found surgery (OR=0.28, 0.0–1.03) and nutrition (OR=0.12, 0.03–0.43) as protector factors. In the multiple regression analysis of scores, age, chest trauma and TBI, the variable with independent mortality effect was age (OR=1.05, 1.0–1.1). Between management variables (amines, VM, nutrition, surgery) amines (OR=31.1, 2.1–453.2) have independent effect; surgery (OR=0.18; 0.04–0.8) and nutrition are protective (OR= 0.11, 0.016–0.77).

CONCLUSIONS. We found that the best predictors of mortality in patients with abdominal trauma are RTS, GCS, ISS, APACHE II, Hb 24 h and the initial base deficit. Age has independent effect in mortality. Nutrition and surgery are protective.

0873**CREATION OF A COLLECTIVE MEDICAL EVACUATION SYSTEM**

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INTRODUCTION. Aeromedical Evacuation (MEDEVAC) is a component dimensioning of French Armed Forces foreign deployment. Considering the technical limitations of the previous collective MEDEVAC system (conversion of an Airbus A 310), the ministry of defense have asked for a new one, designed for multiple MEDEVAC of critically injured patients. The operational requirements of this project were permanent availability and ability to take off at H24 or earlier.

METHODS. We selected a non-dedicated vector among existing French Air Force Aircraft with cargo capacity, high range and permanent availability. A platform meeting of medical and aeronautical standards was then created, based on a combination of modules specifically designed to be changeable. The organization had to be modular, in order to be installed or uninstalled quickly and easily on the plane, and also adapt to a specific mission. Composition and training of medical teams manning this platform were also determined.

RESULTS. The C135FR strategic tanker was chosen as a suitable vector. Eleven Aircraft have been modified to accommodate the medical solution. The technical platform includes patient care modules and logistical modules (2 racks, 1 preparation table and 1 centralized monitoring area). The Module Seriously Injured or Intensive Care Module allows the management of a patient on a respirator. The Module Slight Injury or Light Care Module allows the support of two lightly wounded. The medical team includes 11 to 12 people. This is a mixed team composed of medical and paramedical staff from hospitals, medical services unit and pooling of air conveyors. It consists of two intensivists, two air forces physicians, three anesthetist nurses, two air conveyors and two nurses. All have been trained on the ground and in flight. A twelfth place is reserved for a specialist (neurosurgeon, psychiatrist, cardiologist...) or a liaison officer as part of a mission for the benefit of another nation. The team is sized to ensure its ability in taking charge of about 6 to 12 injured people during about 10 h for a mission lasting a total of 30 to 50 h. Designed to reproduce the conditions for monitoring a patient in an ICU, the composition of the conveying team was studied to ensure the continuum of care throughout the flight.

CONCLUSIONS. The MEDEVAC system and its successful operational missions emphasize the versatility and efficiency of a solution based on mission-tailored "plug and play" modules easily and quickly installable aboard a non-dedicated aircraft.