Our Experience in Providing Ophthalmologic Aid to Accident Victims

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The first reports about eye injuries appeared 10 years ago. Three international symposia were held under the aegis of the Moscow Helmholtz Eye Research Institute. The Institute's staff provided ophthalmologic aid in three major accidents: 1) a tank-car explosion at a railway station in the city of Sverdlovsk in 1988; 2) an oil pipeline blast and a fire in the Russian Republic of Bashkiria in 1989; and 3) an earthquake in Armenia in 1988. A total of 7,378 accident victims were examined.

The major causes of eye injuries were from secondary wounding by projectiles, thermal impact, and shock waves. These factors determined the type of eye injury and the organization of ophthalmologic aid in both the disaster areas and at medical institutions when a great number of people were injured.

The analysis of pathological ophthalmologic changes in accident victims testifies to their polymorphism and association not only with mechanical and thermal eye injuries, but also with the combined effects on the eye of various injuring factors and great stress.

The experience gained allowed the development of a system to organize ophthalmologic aid for a vast number of accident victims with multiple injuries.

The Traumatological Department of the Moscow Helmholtz Eye Research Institute is a part of Russia's United System for "Disaster Medicine', and its staff participates in the work of the traveling medical teams of the All-Russian Disaster Medical Centre "Zashchita".

Key Words: ophthalmologic aid in accidents; polymorphism of pathological changes

Elevated Selectin Levels in Multiple Trauma Patients with Severe Head Injury

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Background: Multiple organ dysfunction remains a leading cause of death days or weeks after multiple injury. Immunological parameters like selectins, contribute to the development of shock, sepsis, and organ failure. Brain contusion is believed to cause inflammatory reactions in brain tissue.

Objective: To investigate the relationship between the levels of the soluble derivatives of E-, P-, and L-Selectin, L-Selectin on B-Lymphocytes, and moderate or severe head injury in multiply injured patients. Groups of patients with head injuries were differentiated according to the Injury Severity Score.

Methods: Blood samples were drawn from 51 multiply injured patients at 10 different points beginning on scene (= 0 hours) to the sixth post-traumatic day (= 144 hours). Commercially available, standardized enzyme-linked immunoassays (ELISA) were used to assay the plasma for sE-, P-, and L-Selectin. CD62L levels on leukocyte sub-populations were detected by means of monoclonal antibodies CD62L (LECAM-I), CD3 (T-cell), CD14 (monocyte) and a standard flow cytometer.

Results: Patients with severe head injury (p = 0.0001) showed a very early increase of P-Selectin in comparison to those with moderate or no head injury. There also occurred a latent increase (p = 0.0026) of sL-Selectin levels (72 hours) in patients with severe head trauma, while L-Selectin expression on CDI9+ B-Lymphocytes is significantly higher (p = 0.0001) in the very early post-traumatic phase (0–24 hours).

Conclusion: The immunological response and subsequently the cell-cell interactions seem to be influenced by the severity of head trauma.

Key Words: head injury; injury severity score; multiple organ dysfunction; multiple trauma; selectins

Should Fluids Be Limited Early in Trauma? Severe Pulmonary Edema Following Aggressive Volume Therapy During Extraction of a Trauma Victim: A Case Report

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Introduction: Maximum volume loading is an accepted gold standard in early trauma therapy. In 1994, Bickell showed a significantly higher mortality in an early volume group vs. delayed fluid therapy in penetrating torso injuries. Besides aggravation of blood loss early in the treatment of trauma, massive fluid resuscitation may cause other negative side effects including pulmonary edema.

Situation at the scene: A healthy, 37 year-old man was injured while working on a swimming pontoon in a gravel pit. His right arm was pulled into a conveyor belt and became stuck. Except for a partial amputation of the right upper arm, no further injuries were visible. All attempts to release the patient from the belt failed. Thus, the emergency doctor performed an amputation of the right upper arm. During the treatment, 4,000 ml of colloids and 2,000 ml of crystalloids solutions were infused.

Admission: The patient was anesthetized, and administered controlled ventilation with an FiO_2 = 1.00. No further injuries were detected. Maximum vasoconstriction was obvious.

MAP:	75 mmHg
Heart Rate:	120–140/min.
CVP:	16 mmHg
ECG:	Atrial fibrillation
Arterial blood gases:	pH = 7.34; pO_2 = 50 mmHg; BE +1.5 mval/l; pCO_2 = 39 mmHg
Lactate:	2.3 mmol/l
Hb:	9.6 g/dl
Chest X-ray:	Diffuse pulmonary edema
Body temperature:	31° C

Clinical diagnosis: Traumatic amputation of the right

upper arm, pulmonary edema, hypothermia.
Treatment: Furosemide, nitroglycerin, positive end-expiratory pressure (PEEP) ventilation, surgical treatment of the stump, antibiotics.
Outcome: PEEP ventilation until the following morning. Thereafter, successful extubation. Discharge to the peripheral ward one day later. Hospital discharge after an uncomplicated course, 8 days later.
Conclusions: Even in young, previously healthy trauma patients, volume therapy has to be considered carefully. Massive fluid loading can cause severe pulmonary edema when blood loss is overestimated and the consequences of hypothermia are ignored.
Key Words: fluid resuscitation; hypothermia; pulmonary edema; trauma

The Role of Abdominal Pansonography in Penetrating War Injuries of the Thorax

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Objective: The authors emphasize the role of abdominal pansonography in patients with penetrating injuries of the thorax with an intact abdominal wall, due to battle in Croatia.
Methods: From August 1991 to August 1995, 88 wounded patients with penetrated injuries of the thorax were sonographically examined . The pansonography of the abdomen was performed in 71 of the wounded within 1 hour after admittance to the Intensive Care Unit, in seven patients within first 24 hours, and in 10 of the injured inside of 72 hours (after urgent thoracotomy).
Results: From 88 patients wounded with trauma of the thorax, 37 (42%) had combined thoraco-abdominal injuries. Rupture of the diaphragm was sonographically present in 18 (49%) while in 19 (51%), it was intact, which was confirmed intraoperatively. Pansonography of the abdomen showed both ruptures of the liver and spleen or spleen and tail of the pancreas in nine of the victims (24%) or solitary ruptures of spleen and liver in 13 (35%). In 3 (8%) patients were found only a free fluid in abdomen (intraoperative: mesentery and small intestine rupture).
Conclusions: Projectiles with high initial speed caused large tissue lesions far from the missile path. Vibration from the bullet in injuries of the thorax resulted in combined thoraco-abdominal wounds. Presented results confirmed the value of sonographic diagnosis in transmitted trauma of the abdomen and point up its necessity in diagnosis and follow-up of those patients.
Key Words: abdominal injuries; bullets; missiles; sonography; thoracic injuries; thoraco-abdominal injuries; war; wounded

The Importance of Research Left Ventricular Function After Acute Severe Trauma

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Introduction: Hypotension, defined as a systolic blood pressure (SBP) lower than 80 mmHg is present in 50% in the early phase of acute, severe trauma (AST). Such an impairment in left ventricular (LV) function has been observed with hypovolemic shock in patients with AST. Therefore, studying LV function after AST seems obvious.
Patients and Methods: Twenty patients admitted to our ICU were studied within the first 3 hours (h) and 24–48 h of the post-traumatic period. Invasive hemodynamic data were obtained from arterial and Swan-Ganz catheters. Cardiac output (CO) was measured by the thermodilution technique. The other parameters (CI, SVR, DO_2, VO_2) were calculated using the standard formulas.
Results and Discussion: After the first 3 h after trauma patients showed high HR (124 ±18 bpm) and lower SAP (95 ±8.7 mmHg), CI (2.3 ±0.5 l/min./m2), SI (37 ±4.1 ml/m2), whereas SVR was elevated. At day 1 and day 2, SBP and CI increased significantly (33.0 ±4.1% and 42 ±3.2% corresponding), whereas SVR and HR decreased, and VO_2 and DO_2 remained essentially unchanged. Therefore, the hypotension observed at the early phase of AST usually is considered to be secondary to hypovolemia, with decreases the venous return and resulting decrease in SAP despite increased SVR. SAP increased during the first hours after trauma and on day 2, suggesting an increased afterload and compensation hypovolemia. Despite a normal or increased CO, ventricular function was impaired, suggested by the low LV ejection fraction. Such myocardial depression could result from myocardial ischemia caused by reduced coronary blood flow and myocardial DO_2.
Conclusion: Following AST, an early alteration of cardiac performance was observed with a decrease LV function. Therefore, measurement of central hemodynamics should play an important role in evaluation of preload and cardiac function for emergent treatment after AST.
Key Words: acute severe trauma, left ventricular function

Tactics and Strategy of Confronting Disaster for Jordan Civil Defense

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It is known that any type of disaster consists of three main stages. They are: I)pre-occurrence or initial insult; II) the occurrence including the three sub-stages; and III) post aftermath or final. In these stages, the recovery, handling, and dealing with different kinds of incident is the responsibility mainly of Civil Defense. This is the only governmental organization that deals with such events.

Stage I

In order to cope with and to mitigate the effect of any disaster, Civil Defense is concerned mainly with Stage I, which is the most important and vital phase to control the disaster: 1) The hazard zone must be defined and specify how it is in accordance with the emergency and mitigation plan; 2) train people; 3) be aware; and 4) per-