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 CD19+ 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 \(\text{FiO}_2 = 1.00\). 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:** \(\text{pH} = 7.34; \text{pO}_2 = 50 \text{ mmHg};\) \(\text{BE} = +1.5 \text{ mval/l}; \text{pCO}_2 = 39 \text{ mmHg}\)
**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