

Alcohol and Trauma: The Perfect Storm

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Source

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Abstract

Alcohol misuse, when combined with the right circumstances, culminates in a Perfect Storm that has catastrophic results.

Alcohol misuse impairs judgment and increases the likelihood of serious injury. Once injured, the intoxicated patient is more likely to be hypotensive and less likely to be able to protect his or her airway.

Alcohol also impairs multiple compensatory responses to injury that are critical to survival, thereby increasing the likelihood of serious complications.

When complications do occur, they may be more severe for intoxicated patients because both acute and chronic ethanol use adversely affect immunity.

Thus, all phases of trauma care are potentially affected by excessive alcohol use.

How Does Alcohol Affect the Patient's Response to Trauma?

Alcohol intoxication can adversely affect early physiologic responses to injury.

- * Alcohol impairs cardiovascular response to acute blood loss. 9-14
- * Alcohol exaggerates post-shock myocardial contractility dysfunction. 10-12
- * Alcohol increases pulmonary vascular resistance. 9
- * Alcohol blunts catecholamine release. The net result is inadequate oxygen delivery to tissue and metabolic uncoupling. 11,13,14

* Acute alcohol ingestion reduces the electrical threshold for ventricular arrhythmias and promotes electro-mechanical dissociation.15-17

Thus, intoxicated patients have a higher risk of dying at the scene following blunt thoracic trauma.

Alcohol consumption can also have profound adverse effects on the outcome of a traumatic brain injury (TBI). In clinical studies, alcohol intoxication is estimated to *double* the severity of TBI.18

Research has shown alcohol to blunt hypercarbicventilatory drive and to reduce cerebral blood flow.19 Although alcohol does not have a direct influence on the coagulation cascade,20 it may indirectly promote bleeding by potentiating the inhibitory effects of aspirin on platelet function.21

Acute alcohol exposure is directly immunosuppressive, increasing the risk for post-injury infections, acute respiratory distress syndrome, and multiple organ failure.22

Specific defects in both innate and adaptive immunity are also results of acute alcohol intake.23,24

Collectively, the direct effects of alcohol on the primary cells of the immune system and indirect cytotoxicity to other cells act synergistically to promote global immunosuppression.

Trauma Surgeons:

Trauma surgeons, perhaps more than other health-care providers, have a unique opportunity and a responsibility to address potential alcohol misuse with their patients. They witness the Perfect Storm almost daily and are fully aware of the short- and long-term consequences of alcohol misuse.

A trauma center visit provides an opportune time and place to incorporate alcohol screening and brief interventions as a part of standard trauma care.