

# Ketamine Administration in Prehospital Combat Injured Patients With Traumatic Brain Injury: A 10-Year Report of Survival

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## Abstract

### Background

The Tactical Combat Casualty Care (TCCC) guidelines recommend ketamine as the primary battlefield analgesic in the setting of moderate-to-severe pain and hemodynamic compromise. However, despite recent studies failing to support the association between ketamine and worse outcomes in head trauma, TCCC guidelines state that ketamine may worsen severe traumatic brain injury. We compared mortality outcomes following head trauma sustained in a combat setting between ketamine recipients and non-recipients.

### Methods

This is a secondary analysis of previously published data in the Department of Defense Trauma Registry from January 2007 to August 2016. We isolated patients with an abbreviated injury scale of 3 or greater for the head body region. We compared mortality between prehospital ketamine recipients and non-recipients.

### Results

Our initial search yielded 28,222 patients, of which 4,183 met the inclusion criteria: 209 were ketamine-recipients and 3,974 were non-recipients. The ketamine group had a higher percentage injured by explosives (59.81% vs. 53.57%,  $p < 0.001$ ) and gunshot wounds (28.71% vs. 22.07%,  $p < 0.001$ ) and were more frequently located in Afghanistan (100% vs. 68.0%,  $p < 0.001$ ). The ketamine group had higher rates of tourniquet application (24.4% vs. 8.5%,  $p < 0.001$ ) and had lower survival proportion (75.1% alive vs.

83.0%,  $p=0.003$ ). All differences were significant. On univariable analysis, the ketamine group had worse odds of survival with (OR: 0.62; 95%CI: 0.45-0.86). When controlling for the presence of an airway intervention and mechanism of injury, the finding was non-significant (OR: 1.09; 95% CI: 0.76-1.55).

## **Conclusions**

In our prehospital combat study, after controlling for confounders, we found no association between administration of prehospital ketamine and worse survival outcomes for casualties with head injuries. However, despite the lack of difference in overall survival noted, those who received ketamine and died had a higher risk ratio for time to death.

**Keywords:** head; ketamine; military; prehospital; tccc; trauma.

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## **Conflict of interest statement**

The authors have declared that no competing interests exist.