

# Intravenous Ketamine Exacerbating Symptoms of Acute Stress Disorder: A Case Report and Systematic Review of Existing Literature

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**Background:** Ketamine is an anesthetic and analgesic with psychotomimetic properties, such as dissociation and altered perception. Acute stress disorder (ASD) and posttraumatic stress disorder (PTSD) are characterized by unwanted memories, intrusive thoughts, and dissociative flashbacks following an acute traumatic event. In patients who have comorbid ASD and physical injury requiring peritraumatic analgesia, it is unknown how analgesic ketamine may affect ASD symptomatology.

**Objectives:** The following case report and accompanying systematic review aim to investigate the effect of peritraumatic ketamine on incidence and severity of ASD, and subsequently the development of PTSD.

**Case:** A 26 year-old male with no prior medical, psychiatric, or significant substance use history presented as a Level 1 trauma activation after sustaining gunshot wounds to the right cheek, left thigh, and left arm.

- **On initial presentation:** the patient reported auditory flashbacks of gunshots and realistic dreams of the traumatic event. IV ketamine was started due to uncontrolled pain on opioids.
- **After ketamine initiation:** his dreams became distorted and he experienced peri-sleep dissociation. Ketamine was stopped and restarted several times due to these distressing symptoms.
- The dissociative qualities of the patient's ASD were only present for the duration of ketamine administration.

**Literature Review:** A literature search revealed 7 articles investigating peritraumatic ketamine and comorbid ASD or PTSD.

- In 2 out of 3 articles which assessed ASD, ketamine was associated with significantly greater incidence and worsened symptoms of ASD.
- Among the 6 articles that investigated PTSD, 3 found no difference in incidence and symptoms in patients who received ketamine, whereas 2 found decreased incidence and 1 found increased incidence.

**Discussion:** Our findings could suggest that ketamine's psychotomimetic properties can exacerbate the dissociative and perceptual symptoms of ASD. The findings on peritraumatic ketamine and incidence of PTSD are mixed. ASD is not always present in acute trauma patients nor predictive of PTSD development, leaving a subset of patients in which ketamine may still be a viable analgesia option.

**Table 1: Literature Review Results**

ASD Only	Schonenberg 2008	Peripheral accident victims who received peritraumatic ketamine experienced significantly increased ASD symptoms compared to those who received opioids.
ASD & PTSD	Schonenberg 2005	Peripheral accident victims who received ketamine experienced significantly increased ASD and PTSD symptoms compared to those who received opioids
	Mion 2017	In battlefield victims, there was no independent association between posttraumatic ketamine and incidence of ASD and PTSD.
PTSD Only	McGhee 2008	In burn victims, there was a significantly lower incidence of PTSD in those who received ketamine.
	McGhee 2014	In burn victims, there was no association between intraoperative ketamine and PTSD incidence.
	Melcer 2022	In combat injury victims who developed PTSD, significantly fewer had received prehospital ketamine compared to prehospital opioids.
	Usuki 2012	In MVA victims, there was no association between peritraumatic ketamine & PTSD incidence.