



Ketamine Correlates with Decreased PTSD In Burned Service Members

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The use of Army medical assets other than Army records in the preparation of this material is acknowledged, but it is not to be construed as implying official Department of the Army approval of the information presented.

Introduction:

- Up to 17% of returning OIF/OEF veterans have cognitive and psychological symptoms consistent with PTSD (1).
- PTSD is an anxiety condition that often arises after a traumatic experience in which the participant is threatened with harm (2).
- Recent literature also points to a link between untreated pain and PTSD.
- The PTSD Checklist-Military (PCL-M) is a screening tool for PTSD that consists of 17 questions. A score of 44 or higher is considered a positive screen for PTSD (3).
- Ketamine is a psycho-active drug that at high concentrations causes hallucinations. However, intra-operative ketamine is not associated with increased PTSD development and is correlated with decreased PTSD development (4).
- This study investigated the association between the timing of intra-operative ketamine administration and the prevalence of PTSD in burned OIF/OEF service members.

Figure 2. Patients who underwent surgery had a prevalence of PTSD of 30%. Patients with PTSD received significantly less ketamine during their operative procedures than those without PTSD (229.2 mg ± 320.6 vs 410.8 mg ± 657.7).

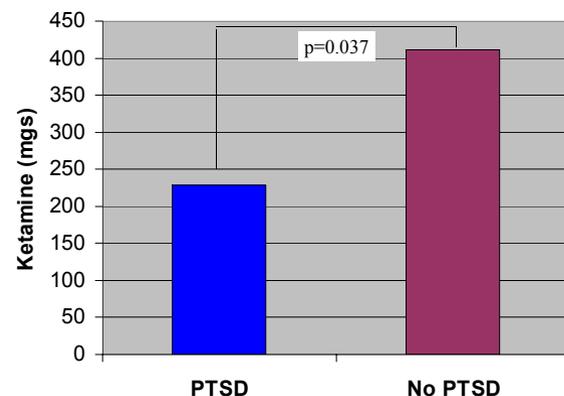


Table 1. Demographics of PTSD and No PTSD patients undergoing surgery. Patients had similar injury severity and burn size. Patients also underwent a similar number of operations.

	PTSD n=43	No PTSD n=100	p-value
TBSA	26.1 ± 16.9	28.6 ± 20.9	p=0.767
ISS	20.4 ± 14.0	22.2 ± 12.8	p=0.481
number of operations	3.8 ± 3.5	5.2 ± 4.9	p=0.083
Morphine in OR	244.4 mg ± 304.5	506.7 mg ± 780.4	p=0.069

Table 2. Patients who received ketamine scored significantly lower on questions related to re-experiencing on the PCL-M. The PCL-M is a self-report questionnaire with three subsets.

Subset of PCL-M	Ketamine n=118	No ketamine n=25	p-value
Subset 1. Re-experiencing	10.0 ± 5.3	12.8 ± 5.1	p=0.009
Subset 2. Avoidance/numbing	12.6 ± 6.5	15.3 ± 6.2	p=0.059
Subset 3. Hyperarousal	11.1 ± 5.6	13.4 ± 6.5	p=0.054

Figure 3. Schematic representation of the surgeries. Of the patients receiving ketamine in one or more of their surgeries, there were 219 surgeries. Of those 116 occurred during the acute phase of their injury (less than 30 days) and 103 occurred during the chronic phase of the injury (greater than 30 days).

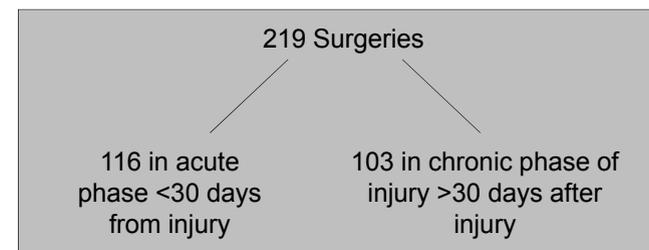


Table 3. Patients without PTSD received more intra-operative ketamine during the acute phase of their injury (307 mg ± 442 vs 141 mg ± 174, *p=0.014), but not during the chronic phase of injury (209 ± 409 vs 188 mg ± 278, p=0.966).

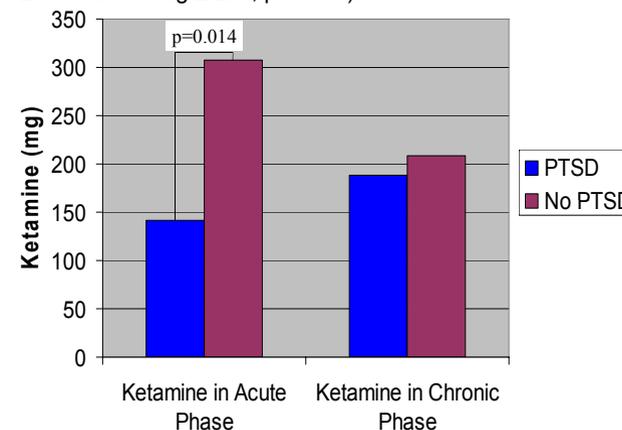


Table 4. There is a negative correlation between ketamine administration during the acute phase of injury and PTSD development (Spearman's r=-0.228, p=0.014), but not during the chronic phase (r=-0.004, p=0.967).

	PTSD development
Ketamine in acute phase	rho=-0.228, p=0.014
Ketamine in chronic phase	rho=-0.004, p=0.967

Table 5. Patients who received ketamine in the acute phase of their injury scored significantly lower on questions related to re-experiencing on the PCL-M.

Question	Ketamine n=96	No ketamine n=20	p-value
Subset 1. Re-experiencing	10.0 ± 5.3	11.7 ± 5.2	p=0.021
Subset 2. Avoidance/numbing	12.4 ± 6.3	14.8 ± 7.2	p=0.066
Subset 3. Hyperarousal	11.0 ± 5.3	13.0 ± 5.8	p=0.086

Discussion and Conclusions

- Ketamine is not associated with increased risk of PTSD development despite its psycho-active properties.
- Ketamine is associated with decreased prevalence of PTSD in burned soldiers
- Patients who received intra-operative ketamine have significantly lower scores on Subset 1 of the PCL-M indicating less re-experiencing.
- PTSD patients received less ketamine in the acute phase of their treatment as compared to Non PTSD suffering patients.
- Intra-operative ketamine administration within the first 30 days after injury is correlated with decreased PTSD development. However, intra-operative ketamine administration in the chronic phase is not.
- Establishment of a direct causal relationship requires more investigation.
- Ketamine should not be withheld due to concerns about PTSD development.

References:

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Figure 1. Patient population. This study investigated the use of intra-operative ketamine in PTSD patients.

