



Propranolol is not Associated with Altered Prevalence of Post Traumatic Stress Disorder in Burned Service Members

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Introduction:

- Burn injuries are characterized by hyper-metabolism resulting in increased catecholamine levels and muscle catabolism. To treat or prevent muscle catabolism, beta-adrenergic receptor blocking agents, such as propranolol, are given to decrease catecholamine levels and muscle breakdown.

- Up to 17% of returning OIF/OEF (Operation Iraqi Freedom/Operation Enduring Freedom) non-injured veterans [no combat injury] report cognitive and psychological symptoms consistent with Post Traumatic Stress Disorder (PTSD) [1]. PTSD is a psychological disorder characterized by recurrent flashbacks, nightmares, emotional disturbances, social withdrawal and forgetfulness after a traumatic event [2].

- PTSD has been reported to affect almost half of the burn patient population, with civilian burn centers reporting a range of 8-45% [4-5]. The US Army Institute of Surgical Research reports a PTSD prevalence of ~20% [6].

- PTSD is based on memory of a traumatic event. Established memories can become sensitive again through reactivation and can be disrupted by administration of noradrenergic blockers.

- PTSD prophylactic agents including β -blockers, which prevent memory reconsolidation, are frequently given to patients who were exposed to traumatic effects to prevent PTSD development [7]. One commonly used β -blocker, propranolol, is known to disrupt memory reconsolidation through antagonism of the beta-adrenergic receptor itself.

- This study will examine the association of propranolol administration and the prevalence of PTSD in burned soldiers. This study will also examine the correlation of propranolol and re-experiencing the traumatic event and nightmares.

Figure 1. Schematic representation of patients analyzed in study.

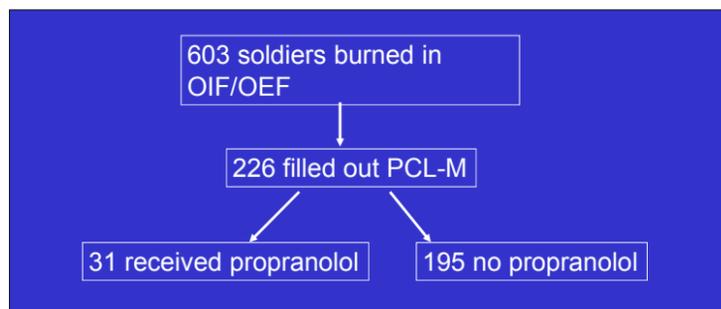


Table 1. Prevalence of PTSD in propranolol group and non-propranolol group. $p=0.745$. There was no statistical difference in the prevalence of PTSD in either group.

	No Propranolol	Propranolol
Patients	195	31
Scoring Positive for PTSD	52	10
Prevalence of PTSD	26.6%	32.3%

Table 2. Demographics of propranolol and no propranolol group. * denotes $p < 0.05$. Patients who received propranolol were more severely injured than the no propranolol group.

	No Propranolol N=190	Propranolol N=36
TBSA	10.1 \pm 10.9*	37.6 \pm 19*
ISS	8.4 \pm 8.4*	27.3 \pm 11*
Operations	1.0 \pm 1.5*	3.6 \pm 3.4*
Total Ketamine	83.7 \pm 220*	630.2 \pm 940*
Morphine Equivalent Units	75.7 \pm 175*	380 \pm 435*
Age	25.2 \pm 5.9	26.6 \pm 5.9

Figure 2. Schematic representation of patients with similar TBSA. This patient grouping will create a similar patient profile

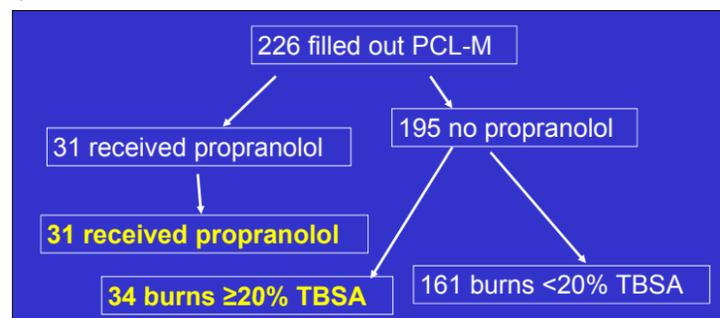


Table 3. Even with similar TBSAs, patients in the propranolol group and the no propranolol group had a similar prevalence of PTSD.

	No Propranolol	Propranolol
Patients	34	31
TBSA	32 \pm 13.1	38 \pm 19
ISS	22 \pm 9.5*	27 \pm 11*
Operations	3 \pm 2.44	4 \pm 3.4
Scoring positive for PTSD	9	10
Prevalence of PTSD	26.5%	32.3%

Table 4. Association of propranolol and nightmares and sleep disturbances. The average score for PCL-M questions 1, 2, 4, and 13. * denotes $p < 0.05$.

Question	No Propranolol N=34	Propranolol N=31
1. Repeated, disturbing memories, through or images of a stressful military experience?	2.7 \pm 1.4	2.5 \pm 1.4
2. Repeated, disturbing dreams of a stressful military experience?	2.3 \pm 1.4	2.2 \pm 1.5
4. Feeling very upset when something reminded you of a stressful military experience?	2.4 \pm 1.2	2.7 \pm 1.3
13. Trouble falling or staying asleep?	2.8 \pm 1.6	3.0 \pm 1.6

Limitations of Study:

Retrospective study with all the inherent limitations. Additional limitations including no standardized time of propranolol administration and no standardized dose of propranolol. There was also patient bias as only patients who filled out the PCL-M were included in the study.

Conclusions:

- Burned service members have a prevalence of PTSD (27%) similar to civilian burn patients (8-45%)

- Use of propranolol is not associated with altered PTSD prevalence in burned service members (27% vs 32%) even when patients have similar sized burns.

- Use of propranolol is not associated with altered prevalence of memories and nightmares as determined by the PCL-M. The PCL-M is a self report screening tool for PTSD consisting of 17 questions addressing the areas of re-experiencing, avoidance/numbing and hyperarousal. A score of 44 or higher was considered positive for PTSD in this study.

References:

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