Clotting Propensity in Trauma Patients According to Marijuana Use: A Descriptive Analysis

Andrew LoPolito, Tala Mourabet BS, Huda Syed, Catherine Ting Brown BS, Launick Saint-Fort BS, Michael A. Horst PhD, MPHS, MS, Lindsey L. Perea DO, FACS

Trauma and Acute Care Surgery

BACKGROUND

- Despite its widespread consumption in the US, understanding of whether marijuana mediates in-hospital complications remains incomplete
- Some studies have reported higher rates of hypercoagulable states amongst hospitalized marijuana users versus nonusers
- We were principally interested in how marijuana use might modulate rates of venous thromboembolism (VTE), a major contributor to morbidity and mortality in patients sustaining traumatic injury
- **We hypothesized that higher rates of VTE and bloodwork indicating an increased clotting proclivity would be observed in the marijuana positive (THC +) group versus the marijuana negative (THC -) group**

METHODS

- 3.5-year (2018-2021), retrospective, single-institution study at our Level I Trauma Center
- Patients were excluded if they tested positive for drugs which were not clinically administered to them or if they did not have a completed urine toxicology
- Analyses between marijuana-positive and marijuana-negative groups were performed using two-sample t-tests and chi-squared tests

Variable	THC Negative (n=1,963)	THC Positive (n=392)	p
Age, mean (SD)	51.7 (21.8)	32.6 (13.9)	<0.001
ISS, mean (SD)	8.74 (8.82)	7.55 (7.52)	0.007
TRISS, mean (SD)	0.97 (0.08)	0.99 (0.03)	<0.001
Hospital LOS, mean (SD)	4.72 (7.35)	4.1 (9.54)	0.230
ICU LOS, mean (SD)	1.36 (4)	1.17 (4.32)	0.404
Admission R Time, mean (SD)	4.76 (1.31)	4.9 (1.16)	0.039
	n (%)	n (%)	
Male Sex	1,193 (60.8)	297 (75.8)	<0.001
Race			<0.001
White	1745 (89.3)	273 (69.8)	
Black	117 (6)	85 (21.7)	
Asian	31 (1.6)	3 (0.8)	
Other	61 (3.1)	30 (7.7)	
Mechanism of Injury			<0.001
Not Reported	5 (0.3)	0 (0)	
MVC	651 (33.2)	140 (35.7)	
Fall	666 (33.9)	63 (16.1)	
Stab Wound	31 (1.6)	17 (4.3)	
Pedestrian Struck	81 (4.1)	13 (3.3)	
Industrial/Construction	45 (2.3)	6 (1.5)	
Assault	47 (2.4)	23 (5.9)	
Bicycle	67 (3.4)	6 (1.5)	
Motorcycle/ATV	177 (9)	62 (15.8)	
Gunshot Wound	33 (1.7)	44 (11.2)	
Other	160 (8.2)	18 (4.6)	
VTE	25 (1.3)	3 (0.8)	0.397
History of VTE	19 (1)	5 (1.3)	0.587
Massive Transfusion Protocol	20 (1)	3 (0.8)	0.641
Reversal Agent Administration	61 (3.1)	5 (1.3)	0.045
VTE Prophylaxis Administration	924 (47.1)	176 (44.9)	0.431
Benzodiazepine Use	231 (11.8)	63 (16.1)	0.019
Barbiturate Use	9 (0.5)	0 (0)	0.179
Opiate Use	235 (12)	68 (17.3)	0.004
Amphetamine Use	23 (1.2)	7 (1.8)	0.322
Mortality	58 (3)	3 (0.8)	0.013

Table 1. Univariate analysis of patients with positive or negative marijuana (THC) toxicology. (MVC - motor vehicle crash; VTE - venous thromboembolism; SD - standard deviation; ISS - injury severity score; TRISS - trauma injury and severity score; LOS - length of stay; ICU - intensive care unit).

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RESULTS

- 2,355 patients included in the study
- 83% of these patients tested negative for marijuana, 17% tested positive
- VTE developed more frequently in the marijuana-*negative* group versus the marijuana-positive group, but did not reach statistical significance due to low occurrence of VTE
- Patient thromboelastography (TEG) revealed a longer average R time in the marijuana-positive group versus the marijuana-negative group (though both were in the normal range for our institution)

CONCLUSIONS

- We found evidence contradictory to our hypothesis, observing a trend towards reduction in VTE frequency among marijuana users compared to nonusers
- Few VTE occurrences prevented definitive conclusions regarding our hypothesis from being drawn
- The contradictory nature of our results with existing literature on the topic, as well as potentially confounding variables (e.g., age, timing of marijuana use), necessitate statewide or nationwide studies on the topic, enabling large scale linear regressions