



DENVER HEALTHTM

est. 1860
FOR LIFE'S JOURNEY

Prevalence of Alcohol and Drug Use in Trauma Activations that Sustained Orthopedic Injuries and Its Effects On Hospital Course

Alla Balabanova, MD (1); Lori Chambers, MD (2); Joshua Parry, MD (2); Cyril Mauffrey, MD (2)

1) University of Colorado, Aurora, Colorado
2) Denver Health Medical Center, Denver, Colorado

Background

Drug and alcohol use has been associated with orthopedic injuries and complicates outcomes regarding hospital stay and recovery. Several studies have shown that alcohol and illicit drug use predisposes patients to orthopedic injuries (1-7). However, there have been no studies evaluating toxicology results in orthopedic trauma patients that required a trauma activation.

The purpose of this study is to evaluate the prevalence of alcohol and drug use in patients that required a trauma activation upon arrival to the emergency department and sustained orthopedic injuries. The secondary objective was to assess how illicit substances affected open fractures, hospital stay and death rates.

Methods

An IRB approved retrospective review of an orthopaedic trauma registry between 2017 and 2020 identified 745 patients that presented as a trauma activation and sustained orthopedic injuries. Blood alcohol levels (BAL), urine drug screens (UDS), open fractures, length of hospital stay (LOS), and death rates were recorded.

Patients that screened positive for opioids or benzodiazepines that were administered the respective medications in the field, or had an ongoing prescription, were marked negative for the respective drug screen in our records. BAL screening was considered positive with any detectable alcohol level.

Patients that did not undergo a trauma activation with orthopedic injuries were excluded from our data set.

Disclosures

The authors have nothing to disclose.

Figures

	Tested	Not Tested
Alcohol Screen	504/745 (68%)	241/745 (32%)
Drug Screen	366/745 (49%)	379/728 (51%)

Table 1. Distribution of trauma activations with and without alcohol and drug screens

Patient Characteristics	Alcohol Screen n=504	No Alcohol Screen n=241	Difference*	95% Confidence Interval	P-value
Age (median, IQR)	34 (26 to 49)	34 (22 to 53)	0	-4 to 5	0.4258
Female sex (n, %)	130/504 (26%)	50/241 (21%)	3%	-10% to 3%	0.3529
Hospital Length of Stay, days (median, IQR)	9 (3 to 19)	5 (2 to 13)	4	-5 to -2	<0.0001
Injury severity score (median, IQR)	21 (10 to 33)	13 (8 to 24)	8	-12 to -2	<0.0001
Outcome, death	30/504 (6%)	12/241 (5%)	-1%	-4% to 3%	0.8640

Table 2. Comparison of trauma activation of who people who were screened for alcohol vs. not screened

Patient Characteristics	Drug Screen n=366	No Drug Screen n=379	Difference*	95% Confidence Interval	P-value
Age (median, IQR)	33 (25 to 48)	35 (24 to 51)	2	-0.5 to 6	0.8082
Female sex (n, %)	94/366 (26%)	86/379 (23%)	-2%	-8% to 4%	0.5480
Hospital Length of Stay, days (median, IQR)	10 (4 to 21)	5 (1 to 15)	5	-6 to -3	<0.0001
Injury severity score (median, IQR)	22 (12 to 34)	13 (8 to 26)	9	-11.5 to -5	<0.0001
Outcome, death	19/366 (5%)	23/379 (6%)	1%	-2% to 5%	0.5294

Table 3. Comparison of trauma activation of who people who were screened for drug vs. not screened

	(+) Screen	(-) Screen
Alcohol Screen Tested	251/504 (50%)	253/504 (50%)
<0.08 BAC	51/251 (21%)	
>0.08 BAC	200/251 (79%)	
Drug Screen Tested	135/366 (36%)	231/366 (64%)
Single Substance	22/135 (83%)	
Poly Substance	113/135 (17%)	
Substances Tested		
Amphetamines	72	
Benzodiazepines	4	
Cannabinoid	16	
Cocaine	63	
Methadone	2	
Opiates	2	

Table 4. Distribution of results of trauma activations with documented alcohol and drug screens

Patient Characteristics	(+) Alcohol Screen n=251	(-) Alcohol Screen n=253	Difference*	95% Confidence Interval	P-value
Age (median, IQR)	33 (26 to 51.5)	37 (26 to 46)	4	-4 to 1	0.2527
Female sex (n, %)	60/251 (24%)	70/253 (28%)	4%	-4% to 11%	0.3599
Hospital Length of Stay, days (median, IQR)	9 (3 to 20)	10 (3 to 17)	-1	-2 to 1	0.3902
Injury severity score (median, IQR)	19 (10 to 31.5)	22 (10 to 34)	3	-4 to 1	0.3632
Outcome, death	13/251 (5%)	17/253 (7%)	2%	-3% to 5%	0.5730

Table 5. Comparison of trauma activation with positive alcohol screen compared to a negative screen.

Patient Characteristics	(+) Drug Screen n=135	(-) Drug Screen n=231	Difference*	95% Confidence Interval	P-value
Age (median, IQR)	36 (27 to 47)	32 (24 to 51)	4	-7 to 1	0.5395
Female sex (n, %)	35/135 (26%)	59/231 (25%)	-1%	-12% to 10%	0.9012
Hospital Length of Stay, days (median, IQR)	9 (4 to 18)	10 (5 to 22)	1	-2 to 3	0.1831
Injury severity score (median, IQR)	22 (11 to 34)	22 (12 to 33)	0	-3 to 7	0.9814
Outcome, death	7/135 (5%)	12/231 (5%)	0%	-5% to 5%	1.0000

Table 6. Comparison of trauma activation with positive drug screen compared to a negative drug screen.

Results

745 patients were identified; 504 (68%) patients were screened for alcohol and 379 (51%) were screened for drug use. (Table 1)

Patients who were tested for BAL and UDS on arrival had higher ISS ($p < 0.0001$ for both) and had prolonged hospital courses compared to those that were not tested on arrival ($p < 0.0001$). (Table 2 & 3).

Of the patients screened for BAL, 251 (50%) tested positive. Of the patients screened with a UDS, 135 (36%) were positive with the following prevalence: methamphetamines (54%), cocaine (48%), cannabinoids (12%), benzodiazepines (3%), opiates (2%), & methadone (2%). (Table 4).

Patients with a positive UDS and positive cocaine screen were more likely to have an open fracture (OR 1.81, 95% CI 1.15 to 2.85; OR 18, 95% CI: 1.03 to 3.31, respectively).

Positive BAL or UDS did not have an effect on LOS or death rates. (Table 5 & 6).

Conclusions

Drug use continues to have a significant burden on healthcare resources and contribute to orthopedic injuries requiring surgical intervention with alcohol and stimulants being most prevalent in the patient population treated in our institution. We emphasize the utility of a thorough physical exam to prevent missed injuries especially in altered or agitated patients.

References

