The Impact of Alcohol Level on Elderly Trauma Patients Presenting to the Emergency Department

T Wasfie MD FACS, H White MD, T Casey OMS-III, J Hella MPH, K Barber PhD, B Shapiro MD FACS

Background:

It is well known that alcohol consumption and operation of a motor vehicle is a lethal combination. Throughout the United States, driving with a blood alcohol content (BAC) greater than 0.08 mg/dL is considered illegal and renders the driver susceptible to legal action. Currently, the alcohol consumption by the elderly population is on the rise, as is the elderly trauma patient. Keeping in mind that in elderly patients, by far, the most common cause of blunt trauma are falls and motor vehicle accidents. In this study, we elected to evaluate the impact of alcohol consumption on outcomes of elderly blunt trauma patients presenting to our Level II emergency department (ED).

Methods:

A retrospective analysis of 451 trauma patients seen in the ED with positive alcohol levels was conducted. We collected patient records from our trauma registry from January 2014 to December 2020. The data collected included patient age, sex, GCS, ISS, comorbid conditions, alcohol level, hospital length of stay, ICU length of stay, anticoagulant use, mortality, and pregnancy status. Statistical analysis was performed using a Student's t-test for continuous variables and Chi-square tests for non-continuous variables and calculated significance of p-value at ≤0.05. Cox regression analysis was used to identify the confounding and significant factors that influence outcomes. The patients were divided into two groups according to age (group 1, 65 years and older, and group 2, 64 years and younger.

Results:

A total of 449 patients were seen in the ED following blunt trauma with positive alcohol levels. The mean age was 42 years, SD ±16.9 years, and ranged from 18-91 years old. There were 314 males (70%) and 135 females (30%). The average GCS was 14.4, and the average ISS was 7.0. The mean alcohol level was 176 g/dL ±91.6. Patients were divided into two groups according to age. Group 1 was those aged 65 years or older (n = 48), while group 2 was those aged 64 and younger (n = 401). There were no significant differences in gender, GCS, or ISS. However, the mean hospital and ICU length of stay was significantly higher in the elderly group (4.1 & 2.4 days respectively compared to 2.8 & 1.1 days in the younger group (p=0.018 & 0.063).

Factor	Older Group ≥ 65yr (n=48)	Younger Group <65yr (n=401)	p-value
Gender-males (n, %)	36 (75)	279 (69.6)	.44
Caucasian (n, %)	46 (95.8)	370 (92.7)	.84
GCS (mean, sd)	14.1 (2.4)	14.4 (1.9)	.25
ISS (mean, sd)	8.8 (9.6)	608 (6.9)	.085
DM (n, %)	11 (22.9)	20 (5.0)	.000
HTN (n, %)	28 (58.3)	69 (17.2)	.000
CAD (n, %)	12 (25)	23 (5.7)	.000
CKD (n, %)	3 (6.3)	3 (.7)	.018
Anticoagulant (n, %)	16 (39)	32 (8.5)	.000
Ativan and vitamins (n, %)	15 (33.3)	71 (18.7)	.08
Alcohol Levels [mean g/dL, (sd)]	147.0 (85.0)	179.2 (9.7)	.028
Hospital LOS (mean, sd)	4.1 (4.4)	2.8 (3.5)	.019
ICU Transfer (n, %)	24 (50.0)	123 (30.7)	.007
ICU LOS (mean, sd)	2.4 (3.7)	1.2 (2.6)	.003
Mortality	3 (6.3)	2 (.5)	.01

Table 1: Trauma Patients with Positive Alcohol Levels: Factors by Age Groups.

Results Cont:

Mortality was also higher in the elderly group (6.2% vs 0.5%, p = 0.01). Elderly patients had a significantly higher rate of comorbid conditions, including diabetes mellitus, hypertension, coronary artery disease, and chronic kidney disease. Mean alcohol level was significantly lower in the elderly group (147.0 g/dL) than the younger group (179.2 g/dL). In adjusted regression analysis, the only predictor of mortality was GCS (Wald = 12.5, p = 0), while alcohol level was not a significant predictor (Wald = 0.44, p = 0.51). Furthermore, ICU and hospital LOS were predicted by ISS and patient comorbid conditions, alcohol did not.

Discussion:

Due to an aging metabolism, even an elderly patient who consumed a small amount of alcohol is susceptible to significant mental and physical impairment. Therefore, identifying and addressing alcoholism remains an important preventional step in caring for older patients. One of the major challenges to the trauma team and the ED physician in dealing with alcoholic trauma patients is the depressive effect of alcohol on the central nervous system. Moreover, an intoxicated patient may not be able to give an accurate account of the incident or the relevant medical history necessary for optimal patient care. Additionally, inebriated patients may show poor judgment and delayed reflexes, which make neurological evaluation more challenging. Alcohol also impairs cognitive and motor skills resulting in slowed reaction time, ultimately placing the patient and those around him/her at higher risk of injury.

Conclusion:

Elderly patients that presented to the ED with blunt trauma and a positive alcohol level had a higher mortality and longer hospital/ICU length of stay when compared to younger groups, mainly due to associated comorbidity. Alcohol level in our group of patients did not play a significant role in their outcome.

References
1. Cherpitel, C. J. (2014). Focus on: the burden of alcohol use—trauma and emergency outcomes. *Alcohol research: current reviews.* 2013;35(2),150-154.
2. Teichman A, Perea LL, San Roman J, et al. The Effect of Alcohol Consumption on Geriatric Trauma Outcomes. *J Surg Res.* 2020;254:364-368. doi: 10.1016/j.jss.2020.05.011
3. Vincent, G. K. (2010). *The next four decades: The older population in the United States: 2010 to 2050* (No. 1138). US Department of Commerce, Economics and Statistics Administration, US Census Bureau.
4. Wagner N, Relja B, Lustenberger T, et al. The influence of alcohol on the outcome of trauma patients: a matched-pair analysis of the TraumaRegister DGU®. *Eur J Trauma Emerg Surg.* 2020;46(3):463-472. doi: 10.1007/s00068-019-01231-0.