Alcohol Use at the Time of Traumatic Brain Injury: Screening and Brief Intervention in a Community Hospital

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ABSTRACT

The use of screening and brief interventions (SBI) has been proposed to reduce future alcohol misuse and injury in traumatic brain injury (TBI) patients. As a result a SBI protocol for TBI patients was introduced with nursing training at a community hospital. In the 2 years following the implementation of a SBI protocol and nursing training, the number of patients with positive alcohol results decreased. The number of brief interventions increased to 83 (40.1%, 95% confidence limit [CL] = 33.4, 46.8), and CAGE questionnaire screenings decreased to 88 (42.5%, 95% CL = 35.8, 49.2), with 31 (35.2%) having positive results. These results highlight the need to assess processes and training in the emergency department to ensure that SBIs occur.

Key Words

Alcohol-induced disorders, Brain injuries, CAGE questionnaire

In an analysis of the peer-reviewed medical literature from 1994 to 2004, alcohol intoxication at the time of traumatic brain injury (TBI) was found to be prevalent 37%–51% of the time, with worse outcomes observed in TBI patients who had preinjury substance misuse (Parry-Jones, Vaughan, & Miles Cox, 2006). In addition, TBI sustained while under the influence of alcohol was predictive of future TBI (Vaaramo, Puljula, Tetri, Juvela, & Hillbom, 2014). The American College of Surgeons Com-

mittee on Trauma states that “Alcohol is such a significant associated factor and contributor that it is vital that trauma centers have a mechanism to identify patients that are problem drinkers” (ASCOT, 2007).

The use of alcohol screening tools and brief interventions has been proposed to reduce future alcohol misuse and injury in TBI patients (Corrigan, Bogner, Hungerford, & Schomer, 2010). Alcohol screening tools come in a variety of forms, are used to assess for problem drinking or alcoholism, and act as a metric for patients to view their drinking within a larger context of what is healthy and unhealthy. Brief interventions are nonconfrontational encounters between the patients and health professionals designed to improve the chances that patients will reduce the risky drinking behavior. Together, screenings and brief interventions (SBIs) help directly link the trauma event to the patient’s alcohol use and risky behavior (driving under the influence, fighting, etc.) and provide the patients with options if they are ready to change their drinking behavior.

The purpose of this study was to (1) describe the frequency of alcohol use at the time of TBI in adults admitted to St. Mary’s Medical Center (SMMC) trauma services; (2) assess SMMC trauma services’ use of SBI in the 12 months preceding and after practitioners received SBI training and implemented an SBI protocol; and (3) describe the characteristics and outcomes associated with brief intervention before and after training and implementation of an SBI protocol.

METHODS

This project was reviewed and approved by the Essentia Health Institutional Review Board. The implementation of the SBI protocol and corresponding training occurred over a 2-month period between November 29, 2011, and February 5, 2012.

The SBI protocol was triggered whenever a patient was admitted to SMMC trauma services with injuries related to proven or suspected alcohol misuse. A nurse provided an initial screening performed at admission. The patient was asked whether he or she had consumed alcohol within the last 24 hr, and the nurse assessed whether the patient’s trauma was related to consumption of alcohol. Positive

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The project was supported in part by a grant from Essentia Health Duluth Clinic Foundation.

The authors report no conflicts of interest.

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DOI: 10.1097/JTN.0000000000000275

responses to the admission screening generated a best practice alert (BPA), a computerized prompt for nurses and physicians to order a consult for further alcohol SBI. Patients who were unconscious or unable to be screened because of being on a ventilator were monitored during their hospital stay and screened as soon as clinically appropriate.

The admission screening and patient's blood alcohol level were used to determine whether alcohol misuse was a contributing factor to having a traumatic injury. The CAGE questionnaire was used to evaluate alcohol dependency when the patient was known to misuse alcohol. All three screenings were used to determine the need for brief intervention and/or a consultation by a chemical dependency (CD) counselor or social worker.

Blood alcohol content (BAC) screenings provide a metric for alcohol intoxication and typically are taken at the hospital the patient is transferred from, the scene of an accident, or in the emergency department. The CAGE questionnaire, described in Table 1, is an acronym for its four questions. Have you ever felt you needed to Cut down on your drinking? Have people Annoyed you by criticizing your drinking? Have you ever felt Guilty about drinking? Have you ever had a drink first thing in the morning to steady your nerves or to get rid of a hangover (Eye opener)? Positive answers to two or three questions are attributed to problem drinking, whereas affirmative answers to all four questions can be used as a diagnostic tool for alcoholism (Ewing, 1984).

The brief intervention consisted of (1) providing feedback and eliciting a reaction by sharing the patients screening results (blood alcohol level, or CAGE score) as compared with normal/healthy drinking levels; (2) listening and understanding the patient's reaction, thoughts on alcohol use, concerns about drinking behaviors, and readiness to change; and (3) exploring options for change with the patient and following up. Screenings and brief interventions were provided by trained personnel (trauma advanced practice nurses, physician assistants, clinical nurse specialists, social workers, and physicians) and

documented within the progress notes of the patient's electronic health record.

Adults (18 years of age older) admitted to SMMC trauma services with a TBI related to alcohol use from January 1, 2011, to December 31, 2014, were included in this study. The alcohol screening criteria used included positive BAC results from trace levels to beyond legal limit and those suspected of alcohol use. Patients who were younger than 18 years, tested negative for alcohol, or were not suspected of alcohol use were excluded.

Traumatic brain injury was defined as any fracture (skull, base of skull, face bones), cerebral laceration and contusion, concussion, subarachnoid hemorrhage, subdural hemorrhage, epidural hemorrhage, other and unspecified intracranial hemorrhage, intracranial injury of other and unspecified nature, injury to the optic nerve and pathways, or unspecified head injury.

Adult TBI patients were identified from the trauma registry for the calendar years 2011 through 2014, the year's immediately preceding and following implementation of the SBI protocol and training, which occurred during a 2-month period from November 29, 2011, to February 5, 2012. A variety of data elements were extracted from the trauma registry and electronic health record to describe the frequency of alcohol use at the time of TBI, assess SMMC trauma services' use of SBI, and describe the characteristics and outcomes associated with brief intervention and SBI protocol and training. The following variables were abstracted from the trauma registry: gender, age, brief intervention, zip code, length of stay, TBI injury, TBI outcome score, BAC, and triage codes. CAGE score, discharge location, 30-day readmission, ethnicity, and self-reported alcohol consumption variables were extracted from electronic health records. Rural-urban commuting area (RUCA) codes were used to divide county information into smaller residential classes in order to analyze living location characteristics and brief interventions. An urban location is classified by four main codes (metropolitan, micropolitan, small town, and rural). Data were entered into a Microsoft Excel spreadsheet and analyzed in SAS. A *p* value of less than .05 was considered statistically significant.

TABLE 1 CAGE Questionnaire
Questions: <ul style="list-style-type: none">• Have you ever felt you should Cut down on your drinking?• Have people Annoyed you by criticizing your drinking?• Have you ever felt bad or Guilty about your drinking?• Have you ever had a drink first thing in the morning to steady your nerves or to get rid of a hangover (Eye opener)? Scoring: <p>Item responses on the CAGE questions are scored 0 for "no" and 1 for "yes" answers, with a higher score being an indication of alcohol problems. A total score of 2 or greater is considered clinically significant.</p>

RESULTS

Alcohol Use at the Time of TBI

Between 2011 and 2014, a total of 1,386 patients were seen at SMMC trauma services for a TBI, 423 (30.5%) of these patients tested with a positive BAC level, 249 (18%) were tested with negative results, and 714 (51.5%) were not tested or suspected of using alcohol. Of the patients whose TBI was found to be related to alcohol, a brief intervention was given to 161 (38.1%). CAGE Questionnaire screenings were given to 221 (52.2%) patients with an alcohol-related TBI. A total of 68 (30.8%) CAGE Questionnaire screenings

were positive (a score of ≥ 2), of which 25 (11.3%) had a score of 4, indicating a possibility of alcoholism.

SBI Pre- and Posttraining and Protocol

In the 2 years prior to the start date of the SBI protocol and training, 683 patients were treated for a TBI through SMMC trauma services. Of these TBI patients, 216 (31.6%) had a positive BAC. Of those patients with positive screenings, 78 (36.1%, 95% confidence limit [CL] = 29.7, 42.5) received a brief intervention and 133 (61.6%, 95% CL = 55.1, 68.1) received a CAGE. Over a quarter of CAGE questionnaire screenings ($n = 37$, 27.8%) for this time period were positive (a score of ≥ 2).

In the 2 years following the SBI protocol and training (2013–2014), the total number of adult patients treated for a TBI increased slightly to 703. The total number of patients with positive alcohol results decreased to 207 (29.5%). The number of brief interventions increased to 83 (40.1%, 95% CL = 33.4, 46.8), and CAGE questionnaire screenings decreased to 88 (42.5%, 95% CL = 35.8, 49.2), with 31 (35.2%) having positive results. Although there was an increase in the percentage of brief interventions from 31.6% in 2011–2012 to 40.1% in 2013–2014; this change was not statistically significant ($\chi^2 = 0.712$, $df = 1$, $p = .399$). Table 2 shows the association of brief intervention before and after training and implementation of an SBI protocol for patients who have tested positive for alcohol use at the time of TBI.

Patient Characteristics and Outcomes

Patients who received a brief intervention were more likely to be aged 25–34 years (38.8%, 95% CL = 19.2, 78.1), 55–64 years (42.8%, 95% CL = 21.3, 86.0), or 65–74 years (19.0%, 95% CL = 6.4, 56.7); have a level II triage code (184.1%, 95% CL = 117.3, 289.0); and be diagnosed with a concussion (163.7%, 95% CL = 109.5, 244.5). No association was found between receiving a brief intervention and gender, race, RUCA, or whether or not they were smokers. Patient and TBI characteristics associated with brief intervention before and after training and implementation of the SBI protocol are shown in Table 3.

Differences between patients who received a brief intervention and those who did not were found to be significant for TBI outcomes ($\chi^2 = 29.767$, $df = 4$, $p < .0001$); discharge disposition ($\chi^2 = 49.152$, $df = 5$, $p < .0001$); length of stay ($\chi^2 = 15.007$, $df = 4$, $p = .0047$); and postdischarge rehabilitation ($\chi^2 = 22.561$, $df = 2$, $p < .0001$). Outcomes of TBI encounters associated with brief intervention are shown in Table 4.

DISCUSSION

Alcohol Use at the Time of TBI

Over the entire study period, from 2011 to 2014, 30.5% of all patients with a TBI tested positive for alcohol. This rate is lower than has been reported elsewhere. A study using data from the National Trauma Data Bank from 2002 to 2006 found that 49.5% of TBIs had a positive BAC (Chen, Yi, Yoon, & Dong, 2012). Results from a study looking at moderate to severe TBI in Pennsylvania between 1992 and 2009 identified 47.7% of patients to have had a positive BAC (Bernier & Hillary, 2016). It is likely that the rate of patients with TBI with a positive BAC found in this study would have been more in line with the findings of other studies if more than 48.5% of patients were tested.

SBI Pre- and Posttraining and Protocol

Although not significant, there was an increase in the percentage of brief interventions given to patients with alcohol-associated TBIs after the training and implementation of the SBI protocol. Anecdotally, clinical nurse specialists who developed and implemented the SBI protocol for trauma services feel that there are a number of factors that may have influenced the rate of SBIs. Some of these factors include improved awareness among nurses and social workers due to training and the inclusion of the BPA within the electronic health record as a visual reminder to complete the brief intervention. One important factor that may have negatively influenced the number of patients screened is the ability for the admitting nurse to skip past the electronic admission screen. If skipped, there is no visual reminder to follow up with screenings or a brief intervention. The follow-up was dependent on whether the nursing staff recognized that an injury was associated with alcohol use and that a screening had yet to be completed.

A significant barrier to providing the CAGE questionnaire screening to patients who may be problem drinkers or be dependent on alcohol is that the results do not always lead to actionable steps for the trauma team. In theory, a positive CAGE screening should generate an order for a CD consultation. Chemical dependency counselors are trained to work with patients who are alcohol dependent and need extra attention and intervention. However, there are a number of barriers that limit CD consultations for CAGE-positive patients. Orders are not automatically generated and require extra steps to create. In addition, if an order is placed for a CD consult, there may not be enough coverage to follow up with the patient and CD counselors were not available in the evenings or on weekends. The limited capacity of CD counselors to follow up with patients may have negatively impacted whether a practitioner was willing to use the CAGE questionnaire.

TABLE 2 Alcohol Use at the Time of Traumatic Brain Injury—Association With Brief Intervention Before and After Training and Implementation of a Screening and Brief Intervention Protocol

Characteristic— <i>n</i> (%)	Before (2011–2012)			After (2013–2014)			Characteristic ^a		After vs. Before	
	Brief Intervention			Brief Intervention						
	<i>N</i>	No	Yes	<i>N</i>	No	Yes	OR	95% CL	OR	95% CL
Current drinker? ^b										
No	21	16 (76.2)	5 (23.8)	18	16 (88.9)	2 (11.1)	1.000	Reference	1.444	0.839, 2.484
Yes	120	70 (58.3)	50 (41.7)	77	35 (45.5)	42 (54.5)	4.149	1.739, 9.901		
Alcohol level above legal limit										
No	35	29 (82.9)	6 (17.1)	29	24 (82.8)	5 (17.2)	1.000	Reference	1.163	0.780, 1.734
Yes	181	109 (60.2)	72 (39.8)	178	100 (56.2)	78 (43.8)	3.440	1.738, 6.810		
CAGE score ^b										
Negative (0–1)	96	63 (65.6)	33 (34.4)	57	30 (52.6)	27 (47.4)	1.000	Reference	1.425	0.823, 2.466
Positive (≥2)	37	20 (54.1)	17 (45.9)	31	17 (54.8)	14 (45.2)	1.263	0.707, 2.257		
CAGE score ^b										
Negative (0–1)	96	63 (65.6)	33 (34.4)	57	30 (52.6)	27 (47.4)	1.000	Reference	1.443	0.830, 2.510
Problem drinking (2–3)	27	13 (48.1)	14 (51.9)	16	10 (62.5)	6 (37.5)	1.351	0.682, 2.678		
Possible alcoholism (4)	10	7 (70.0)	3 (30.0)	15	7 (46.7)	8 (53.3)	1.121	0.472, 2.666		
<i>Note.</i> CL = confidence limit; OR = odds ratio. ^a Bold values are statistically significant. ^b Patient self-report.										

Patient Characteristics and Outcomes

There are a number of barriers that may explain why patients did not receive an initial alcohol screening or the CAGE questionnaire, and why there were not more brief interventions for this patient population. A critical factor in the SBI protocol at SMMC is whether or not it is triggered during the admission process. If patients are intubated or otherwise incapacitated, they cannot answer the screening questions that would trigger the protocol. Traumatic brain injury patients entering trauma services with Level I triage codes are more likely to be unconscious or may have a severe injury that requires immediate attention. This is confirmed by results showing that Level II triage patients were more likely to receive a brief intervention over the study period. Although the SBI protocol could be triggered for a Level I triage patient, follow-up would have been required if

the patient was not able to be screened at the time of admission.

Differences for those with and without a brief intervention were found for TBI outcomes, discharge disposition, length of stay, and postdischarge rehabilitation. These outcome differences are likely a result of patient characteristics (age, injury severity, etc.) rather than being dependent on the brief intervention.

Improving SBI

Since 2014, a number of strategies have been implemented to improve the rate of SBIs. The intake process now includes a “hard stop” for the two admission screening questions, which forces the admission nurse to address the screening before moving on. To reduce confusion, the second admission screening question was changed to ask whether the admission is due to “injury,” instead of

TABLE 3 Patient and TBI Characteristics—Association With Brief Intervention Before and After Training and Implementation of a Screening and Brief Intervention Protocol

Characteristic— <i>n</i> (%)	Before (2011–2012)				After (2013–2014)				Characteristic ^a				After vs. Before	
	Brief Intervention				Brief Intervention									
	<i>N</i>	No	Yes	<i>N</i>	No	Yes	<i>N</i>	No	Yes	OR	95% CL	OR	95% CL	
	Patient characteristics													
Age														
18–24	34	15 (44.1)	19 (55.9)	32	15 (46.9)	17 (53.1)	1.000	Reference	1.216	0.813, 1.818				
25–34	42	31 (73.8)	11 (26.2)	28	17 (60.7)	11 (39.3)	0.388	0.192, 0.781						
35–44	35	21 (60.0)	14 (40.0)	37	22 (59.5)	15 (40.5)	0.558	0.284, 1.098						
45–54	52	32 (61.5)	20 (38.5)	54	32 (59.3)	22 (40.7)	0.543	0.292, 1.013						
55–64	37	27 (73.0)	10 (27.0)	31	18 (58.1)	13 (41.9)	0.428	0.213, 0.860						
65–74	8	6 (75.0)	2 (25.0)	18	15 (83.3)	3 (16.7)	0.190	0.064, 0.567						
75+	8	6 (75.0)	2 (25.0)	7	5 (71.4)	2 (28.6)	0.303	0.087, 1.052						
Sex														
Male	175	114 (65.1)	61 (34.9)	161	96 (59.6)	65 (40.4)	1.000	Reference	1.180	0.796, 1.749				
Female	41	24 (58.5)	17 (41.5)	46	28 (60.9)	18 (39.1)	1.113	0.687, 1.804						
Race														
White	186	115 (61.8)	71 (38.2)	184	109 (59.2)	75 (40.8)	1.000	Reference	1.170	0.789, 1.735				
Nonwhite ^b	30	23 (76.7)	7 (23.3)	23	15 (65.2)	8 (34.8)	0.611	0.324, 1.152						
Rural urban commuting area														
Metropolitan	105	65 (61.9)	40 (38.1)	96	57 (59.4)	39 (40.6)	1.000	Reference	1.187	0.801, 1.759				
Micropolitan	32	21 (65.6)	11 (34.4)	34	20 (58.8)	14 (41.2)	0.936	0.527, 1.659						
Small town	39	26 (66.7)	13 (33.3)	38	20 (52.6)	18 (47.4)	1.038	0.607, 1.775						
Rural area	40	26 (65.0)	14 (35.0)	39	27 (69.2)	12 (30.8)	0.755	0.436, 1.307						
Current smoker?														
No	108	72 (66.7)	36 (33.3)	110	70 (63.6)	40 (36.4)	1.000	Reference	1.196	0.806, 1.774				
Yes	108	66 (61.1)	42 (38.9)	97	54 (55.7)	43 (44.3)	1.332	0.898, 1.976						
TBI characteristics														
Triage code														
Level I	100	67 (67.0)	33 (33.0)	65	48 (73.8)	17 (26.2)	1.000	Reference	1.101	0.736, 1.645				
Level II	81	49 (60.5)	32 (39.5)	91	46 (50.5)	45 (49.5)	1.841	1.173, 2.890						
Level III	30	17 (56.7)	13 (43.3)	45	26 (57.8)	19 (42.2)	1.679	0.948, 2.972						

(continues)

TABLE 3 Patient and TBI Characteristics—Association With Brief Intervention Before and After Training and Implementation of a Screening and Brief Intervention Protocol (Continued)

Characteristic—n (%)	Before (2011–2012)				After (2013–2014)				Characteristic ^a		After vs. Before	
	Brief Intervention				Brief Intervention				OR	95% CL	OR	95% CL
	N	No	Yes	N	No	Yes	N	Yes				
Direct admit	5	5 (100.0)	0 (0)	6	4 (66.7)	2 (33.3)			0.504	0.105, 2.419		
Types of injury												
Concussion	80	48 (60.0)	32 (40.0)	113	59 (52.2)	54 (47.8)			1.637	1.095, 2.445	1.087	0.728, 1.625
Skull fracture	95	63 (66.3)	32 (33.7)	83	54 (65.1)	29 (34.9)			0.760	0.509, 1.136	1.173	0.791, 1.739
Cerebral laceration and contusion	20	15 (75.0)	5 (25.0)	15	11 (73.3)	4 (26.7)			0.543	0.248, 1.192	1.172	0.790, 1.738
Subarachnoid hemorrhage	37	22 (59.5)	15 (40.5)	25	18 (72.0)	7 (28.0)			0.893	0.508, 1.570	1.178	0.794, 1.746
Subdural hemorrhage	39	26 (66.7)	13 (33.3)	26	17 (65.4)	9 (34.6)			0.820	0.469, 1.431	1.172	0.790, 1.738
Other and unspecified hemorrhage	16	12 (75.0)	4 (25.0)	8	6 (75.0)	2 (25.0)			0.538	0.208, 1.387	1.161	0.783, 1.723

Note. CL = confidence limit; OR = odds ratio; TBI, traumatic brain injury.

^aBold values are statistically significant.

^bNative American, Black, Hispanic, and other unspecified.

“trauma.” Patient screening criteria have been clarified and now exclude patients who are younger than 12 years, deceased, have a moderate/severe TBI, admitted to inpatient rehabilitation, have received a CD consult, stay less than 24 hr, and have comorbidities (chronic alcoholic, severe dementia, etc.). The AUDIT-C, which has been validated as an indicator for alcohol dependence severity and found to be helpful with treatment planning, is now being used in place of the CAGE for patients older than 14 years. The AUDIT-C questionnaire is described in Table 5. To more accurately screen younger patients (12–14 years of age), the CRAFFT adolescent screening tool is being used and is described in Table 6. The CAGE tool demonstrates validity with those who are alcohol dependent. The tool was not appropriate to use on patients who do not drink at all or misuse alcohol, and it is not as sensitive in assessing dependence or misuse as other tools. The AUDIT-C is specifically designed to identify problem drinkers who have not yet become alcohol dependent. The AUDIT-C was chosen because it can detect less severe forms of drinking, which the population trauma centers are most interested in providing brief interventions.

In addition, performance improvement coordinators review new trauma admits daily and create lists of those patients with alcohol-related injuries. These lists act as a reminder to practitioners to provide a brief intervention. Responsibility for performing brief interventions has also been clarified and is now completed by the advance practice nurses. Finally, a new policy for SBI has been drafted to formalize these changes and ensure that they are put into practice.

Preliminary data on SBI indicate that rates for all patients have greatly improved since these changes have gone into effect. In January and March of 2016, nearly 95% of eligible trauma patients were screened for alcohol use and provided a brief intervention. It is expected that ongoing training for nurses and social workers, monitoring of SBI data, and the formalization of SBI policy and procedures will result in rates remaining high.

Limitations

The results of this study should be viewed with several potential weaknesses in mind. First, our analysis was limited to those adults 18 years of age or older. This is in contrast with the American College of Surgeons that defines adults as those 15 years and older and the 2013 National Survey on Drug Use and Health that shows 23% of those aged 12–20 years drink alcohol. The omission of adolescent patients from our analysis was due to unclear screening criteria in the SBI protocol and resulted in fewer alcohol-positive TBI cases and screenings being included in the analysis. An addition limitation is the potential impact of institution specific nontrauma services staffing and electronic health record BPA design

TABLE 4 Outcomes of Traumatic Brain Injury Encounters—Association With BI

Outcome Measure, <i>n</i> (%)	Patients w/o BI		Patients w/ BI		Combined 2011–2014		χ^2	<i>df</i>	<i>p</i>
	2011–2012 (<i>n</i> = 138)	2013–2014 (<i>n</i> = 124)	2011–2012 (<i>n</i> = 78)	2013–2014 (<i>n</i> = 83)	w/o BI (<i>n</i> = 262)	w/ BI (<i>n</i> = 161)			
TBI outcome									
Good recovery	95 (68.8)	77 (62.1)	64 (82.1)	75 (90.4)	172 (65.6)	139 (86.3)	29.767	4	<.0001
Moderate disability	21 (15.2)	29 (23.4)	8 (10.3)	4 (4.8)	50 (19.1)	12 (7.5)			
Severe disability	1 (0.7)	4 (3.2)	1 (1.3)	0 (0)	5 (1.9)	1 (0.6)			
Death	16 (11.6)	6 (4.8)	0 (0)	0 (0)	22 (8.4)	0 (0)			
Unknown or not directly related to TBI	5 (3.6)	8 (6.5)	5 (6.4)	4 (4.8)	13 (4.9)	9 (5.6)			
Discharge disposition									
Expired	16 (11.6)	8 (6.5)	0 (0)	0 (0)	24 (9.2)	0 (0)	49.152	5	<.0001
Left against medical advice	4 (2.9)	4 (3.2)	0 (0)	1 (1.2)	8 (3.1)	1 (0.6)			
Home (with or without home services)	79 (57.2)	70 (56.5)	66 (84.6)	76 (91.6)	149 (56.9)	142 (88.2)			
Transfer to inpatient rehabilitation	27 (19.6)	33 (26.6)	9 (11.5)	2 (2.4)	60 (22.9)	11 (6.8)			
Transfer to skilled nursing facility	5 (3.6)	5 (4.0)	1 (1.3)	2 (2.4)	10 (3.8)	3 (1.9)			
Other releases and transfers ^a	7 (5.1)	4 (3.2)	2 (2.6)	2 (2.4)	11 (4.2)	4 (2.5)			
Length of stay ^b									
0–1.5 days	35 (29.2)	29 (25.0)	21 (27.3)	22 (26.5)	64 (27.1)	43 (26.9)	15.007	4	<.0047
>1.5 to 3.0 days	23 (19.2)	25 (21.6)	22 (28.6)	34 (41.0)	48 (20.3)	56 (35.0)			
>3.0 to 7 days	31 (25.8)	29 (25.0)	17 (22.1)	20 (24.1)	60 (25.4)	37 (23.1)			
>7.0 to 14 days	18 (15.0)	15 (12.9)	12 (15.6)	3 (3.6)	33 (14.0)	15 (9.4)			
>14 days	13 (10.8)	18 (15.5)	5 (6.5)	4 (4.8)	31 (13.1)	9 (5.6)			
Postdischarge rehabilitation ^b									
None	92 (75.4)	78 (67.2)	66 (84.6)	75 (90.4)	141 (87.6)	170 (71.4)	22.561	2	<.0001
Transfer to inpatient rehabilitation	27 (22.1)	33 (28.4)	3 (3.8)	6 (7.2)	11 (6.8)	60 (25.2)			
Outpatient rehabilitation referral	3 (2.5)	5 (4.3)	9 (11.5)	2 (2.4)	9 (5.6)	8 (3.4)			
30-day readmission ^b									
No	112 (91.8)	114 (98.3)	75 (96.2)	80 (96.4)	226 (95.0)	155 (96.3)	0.514	2	.7736
Planned	3 (2.5)	0 (0)	2 (2.6)	0 (0)	3 (1.3)	2 (1.2)			
Unplanned	7 (5.7)	2 (1.7)	1 (1.3)	3 (3.6)	9 (3.8)	4 (2.5)			
Note. BI = brief intervention; TBI, traumatic brain injury.									
^a Other releases and transfers to court/law enforcement, intermediate care facilities, psychiatric hospitals and inpatient psychiatric units, and other inpatient facilities.									
^b Excludes patients who expired during TBI encounter.									

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^bExcludes patients who expired during TBI encounter.

TABLE 5 AUDIT-C, Alcohol Use Disorders Identification Test—Consumption Questionnaire

Questions	Scoring System				
	0	1	2	3	4
1. How often do you have a drink containing alcohol?	Never	Monthly or less	2–4 times per month	2–3 times per week	4+ times per week
2. How many units of alcohol do you drink on a typical day when you are drinking?	1–2	3–4	5–6	7–9	10+
3. How often have you had 6 or more units if female, or 8 or more if male, on a single occasion in the last year?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily
Scoring:					
A total of 5+ indicates increasing or higher risk drinking. An overall total score of 5 or above is AUDIT-C positive.					

TABLE 6 CRAFFT Adolescent Screening Test—Car, Relax, Alone, Forget, Friends, Trouble

Questions:
Part A
1. During the PAST 12 MONTHS, did you: Drink any alcohol (more than a few sips)? (Do not count sips of alcohol taken during family or religious events.)
2. Smoke any marijuana or hashish?
3. Use anything else to get high? (“anything else” includes illegal drugs, over-the-counter and prescription drugs, and things that you sniff or “huff”)
Part B:
1. Have you ever ridden in a CAR driven by someone (including yourself) who was “high” or had been using alcohol or drugs?
2. Do you ever use alcohol or drugs to RELAX, feel better about yourself, or fit in?
3. Do you ever use alcohol or drugs while you are by yourself, or ALONE?
4. Do you ever FORGET things you did while using alcohol or drugs?
5. Do your FAMILY or FRIENDS ever tell you that you should cut down on your drinking or drug use?
6. Have you ever gotten into TROUBLE while you were using alcohol or drugs?
Scoring:
Part A: If “yes” to any questions in Part A, ask all 6 CRAFFT questions. If “no,” ask CAR question then stop.
Part B: Score 1 point for each “YES” answer.
CRAFFT score 0–1: No problems reported. None at this time.
CRAFFT score 2+: Potential of a significant problem. Assessment required.

on trauma service decisions and practices. These factors are not necessarily generalizable to other institutions and would limit the ability of the study to be replicated.

CONCLUSION

This study found that training alone does not significantly improve the rate of SBIs for TBI patients. To make a meaningful increase in SBIs, we recommend that additional interventions be implemented. These would include adding a “hard stop” to the admissions screening and requiring a follow-up if the patient is unconscious or otherwise unable to be screened. We recommend further research into which factors within a SBI protocol and corresponding training improve the SBI rate.

There are many opportunities for ongoing improvement and evaluation of alcohol SBI for TBI patients in a community hospital. We are working with the nursing group to identify strategies to continue to improve uptake of SBI and will formally evaluate the effectiveness of these changes in the future. In conclusion, these results highlight the need to assess processes and training in the emergency department to ensure that SBIs occur.

Acknowledgments

The authors acknowledge Heather Royer, registrar, for her assistance in data collection, and the Essentia Health Duluth Clinic Foundation for its funding support.

KEY POINTS

- Alcohol use is associated with a large percentage of TBI presenting at a community hospital emergency room.
- Education programs alone are not sufficient to increase the use of alcohol screening in busy hospital emergency rooms.
- Other strategies need to be considered to increase SBI, such as “hard stops” at the time of emergency department admission and best practice alerts to follow up with patients who could not be screened at time of admission.

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