Suspected alcohol and addictive narcotic use were more at risk to severe head injury

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Abstrak

Latar belakang: *Cedera kepala menyebabkan dampak seperti gangguan kognitif, perilaku dan keterbatasan fisik. Tujuan studi ini untuk menentukan faktor utama yang berkontribusi terhadap keparahan cedera kepala pada pasien yang dirawat inap di rumah sakit.*
Metode: *Studi ini merupakan bagian dari penelitian "Pengembangan Database Registri Trauma sebagai Penunjang Sistem Surveilans Cedera". Data dikumpulkan dengan cara abstraksi dari rekam medis oleh petugas terlatih dengan formulir registri pada pasien cedera yang dirawat inap di 3 rumah sakit dari bulan Januari – Agustus 2010. Keparahan cedera diklasifikasikan berdasarkan Glasgow Coma Scale (GCS) dengan batasan nilai 3-9 mengalami cedera kepala berat, 10-12 cedera kepala sedang dan 13-15 cedera kepala ringan.*
Hasil: *Dari 450 pasien cedera rawat inap terdapat 36 pasien (8%) yang mengalami cedera kepala berat. Pasien dengan indikasi mengkonsumsi alkohol/narkotik mempunyai risiko hampir 5 kali mengalami cedera kepala berat [rasio odds suaian (ORa) = 4,77; 95% interval kepercayaan (CI)=1,04–21,75] dibanding tanpa indikasi. Pasien yang tidak dirujuk mempunyai risiko 5,5 kali mengalami cedera kepala berat (ORa=5,50; 95% CI=2,28–13,27) dibanding pasien yang dirujuk. Pasien cedera karena kecelakaaan lalu lintas dibanding bukan kecelakaan lalu lintas mempunyai risiko 3 kali mengalami cedera kepala berat (ORa=3,43; 95% CI=1,14–10,32).*
Kesimpulan: *Indikasi mengkonsumsi alkohol/narkotik berkontribusi paling besar terhadap keparahan cedera kepala. Kampanye anti alkohol/narkotik dan perlu dilakukan untuk mencegah cedera kepala berat.* ***(Health Science Indones 2011;2:34-40)***

Kata kunci*: indikasi alkohol, narkotik, cedera kepala berat*

Abstract

Background: The impact of head injuries were cognitive disorder, behavioral disorder and physical limitation. The objective of this study was to identify a major factor that contributes to head injury severity in hospitalized patients.
Methods: This study was part of research "Development of Trauma Registry Databases as a Support System for Injury Surveillance". Data collected by abstraction of medical records by trained personnel using registry form in patients who had hospitalized in 3 hospitals from January to August 2010. Severe head injury classified by the Glasgow Coma Scale (GCS) score 3-9 diagnosed severe head injury, 10-12 moderate head injury and 13-15 mild head injury.
Results: Out of 450 injured patients, 36 patients (8%) who had severe head injuries. Patient who was suspected alcohol and addictive narcotic use had nearly 5-fold increase the risk in severe head injury [adjusted odds ratio (ORa)=4.77; 95% confidence interval (CI)=1.04-21.75] compared to not suspected. Patient who was referred had a 5.5-fold increase the risk in severe head injury (ORa=5.50; 95% CI=2.28-13.27) compared with not referred. Injured person due to traffic accident than other type of accident had 3-fold increase the risk of severe head injury (ORa=3.43; 95% CI=1.14-10.32).
Conclusion: Suspected alcohol or addictive narcotic was the highest risk to severe head injury. Campaign against alcohol and addictive narcotic should be done to prevent head injury severity. ***(Health Science Indones 2011;34-40)***

Key words: suspected alcohol, addictive narcotic, severe head injury

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Injury is a major public health problem in the world and more than two-third problems in the developing countries.[1,2] Injury problems contributed to the mortality, disease and economic losses of Growth Product Development (GDP), respectively 15%, 25% and 5%.[3] In America and Indonesia, showed that the injury is the fourth rank cause of death, especially for the young people.[4]

Head injury is the leading cause of death and disability in children, adults and in the productive age. Head injury can also cause various short-term and long term impacts that cover cognitive disturbance, behavioral disturbance and physical limitation. The major of injury due to motorcycle accident was head injury, approximately 53.4%.[5] Based on the severity of injury measurement, data from Cipto Mangunkusumo Hospital in Jakarta showed that hospitalized patients were 60% to 70% with mild head injury, 15% to 20% moderate head injury and about 10% with severe head injury. The highest mortality rate is around 35% to 50% due to severe head injury.[6]

Contributory factors to the severity of head injury has not been known, we need to identify dominant factor that contribute to severe head injury. The objective of this study was to determine a major factor related to severe head injuries in hospitalized patients.

METHODS

This study was a part of "Development of Trauma Registry Database as a Support System for Injury Surveillance." A cross sectional study was carried out on injured patients attending to emergency department. The study was conducted at three hospitals (Koja hospitals in North Jakarta, Sumber Waras hospital in West Jakarta and Dr, Kariadi hospital in Semarang, Central Java). Data collected by annual trauma registry on hospitalized patients who had injury from January to August 2010. Patients were eligible to be subject if who diagnosed on admission by doctors in the emergency unit in hospital.

Data for analysis was abstracted from 962 medical records using injury registry form by trained medical records personnel. We selected 450 cases of all data (962 patients) who had head injury were eligible subjects. Subjects were eligible to analysis conducted 450 patients who had head injury. Number of subjects who diagnosed head injury were 125 patients (27.-8%) in Koja hospital, 122 patients (27.1%) in Sumber Waras hospital and 203 patients (45.1%) in Dr. Kariadi hospital. Head injury classification based on the tenth revision of International Classification of Diseases (ICD-10) include S00, S01, S02, S03, S04, S05, S06.0, S06.3, S06.4, S06.5, S07, S08, S09 codes.[7] The severity of head injury assessed using Glasgow Coma Scale (GCS). Patient had severe head injury which was GCS score of 3-9, moderate head injury 10-12 score and mild head injury 13-15 score. GCS was a quantitative scale to assess level of consciousness and neurological disorders. Those are three aspects included the reaction of eyes opening, verbal responses and the motor response.[8] The potensial risk factors for this study were sociodemographic characteristics (gender, age, education, occupation and mode of payment) and characteristic of accident that consists of the time of injury, type of accident, current activity, mode of transport to hospital, state of referral, suspected alcohol or addictive narcotic use, type of medical treatment.

Age was categorized into 4 groups: 2-15 years, 15-24 years, 25-44 years and 45-88 years. Education level was the last level of education that consists of low (graduated from primary and secondary school), middle (graduated from high school), high (graduated from bachelor degree) and unknown (missing in medical records). Occupation was classified into 5 groups: unemployment, student, employment (public or private), labors (farmers/fishermen) and others. Mode of payment was who guarantee the cost for hospital care which was divided into out of pocket, insurance (public/private), national health insurance (Jamkesmas) and others. National health insurance was one of health insurances which guaranteed by government.

Time of accident was divided into 2 groups: Monday to Friday as a workday and Saturday to Sunday classified as a holiday. Type of accident based on the ICD-10 classification. These werw

divided into traffic and non traffic. Traffic accident category included road traffic accident, accident in the sea and flight traffic accident. Current activity was categorized into not work related (school, sports, recreation, etc.) and work related. Current activity was an activity before injury. Mode of transport to hospital was the type of vehicles used to carry the injured patient. It was divided into 2 categories: ambulance and non ambulance. Non ambulance was kind of vehicles to carry the injured patient without medical equipment. State of referral was classified into patient referred from other hospitals and not referred (self-injured patient admitted).

Suspected alcohol or addictive narcotic uses were grouped into "yes" and "no." It was determined by observing the physical condition of patients at admission in emergency department. Alcohol and narcotic addictive use examined by doctors and nurses when injured patients admitted to emergency department.

Suspected alcohol or addictive narcotics use are based on direct interviews and observation to physical conditions of the accident victims when admission into the Emergency unit (for patients who are still conscious). Suspected alcohol use if: drinking alcohol "yes", red-eyes, the smell of alcohol from the mouth and drunken condition/disorientation, sweating. Suspected narcotic use if: consumption of narcotics "yes", withdrawal syndrome (sense of pain, anxiety).

Type of medical treatment was a type of medical treatments along hospitalized patient. Those were divided into no surgery, surgery and unknown (missing data /no data) because the sources of data are medical records (not primary data).

A number of potentially risk factors were examined as to whether or not they were potential confounders and/or effect modifiers. Logistic regression analysis was used to control for the confounding effect of other characteristics to the relation between a dominant factors for severe head injury and calculated the risk (adjusted odd ratio). A risk factor was considered to be a potential confounder if in the univariate test it had a P-value <0.25 which would be considered as a candidate for the multivariate model along with all known risk factors for severe head injury.[9] Odds ratios (OR) were estimated by the methods of maximum likelihood. Ninety-five percent confidence intervals were based on the standard error of coefficient estimates. Statistical analyses were done using STATA 9.0 software.

This study was received approval from the Ethics Committee at National Institute of Health Research and Development Ministry of Health and the director of hospitals.

RESULTS

Out of 450 hospitalized patients with head injury 8% (36 patients had severe head injuries. Table 1 shows that mild/moderate and severe head injury similarly distributed with respect to age 2-44 years, education, occupation, out of pocket and insurance payment. Male, aged 45-88 years, high education, and national insurance payment were more likely to be severe head injury.

Table 2 notes that subjects with mild/moderate and severe head injury similarly distributed with respect to current activity, mode of transport to hospital, type of medical treatment. Subject who had emergency treatment during holiday were more likely to be severe head injury.

Table 3 shows that subjects who suspected alcohol or addictive narcotic use contributed nearly 5-fold more likely to have severe head injury compared with subjects with unsuspected. The major factors was adjusted by type of accident (traffic accident), and state of referral. Traffic accidents contributed to the risk 3-fold in severe head injury compared with other type of accident. The referred patient had higher risk 5-fold to severe head injury than not referred.

Table 1. Several demographic characteristics and the risk of head injury severity

	Head injury				Crude odds ratio	95% Confidence Interval	P
	Mild/moderate (n=414)		Severe (n=36)				
	n	%	n	%			
Gender							
Female	127	30.7	7	19.4	1.00	Reference	
Male	287	69.3	29	80.6	2.31	0.93-5.71	0.071
Age							
2-15 years	50	12.1	7	19.4	1.00	Reference	
15-24 years	126	30.4	12	33.3	0.51	0.14-1.82	0.303
25-44 years	154	37.2	12	33.3	0.34	0.10-1.48	0.164
45-88 years	84	20.3	5	13.9	0.23	0.05-1.00	0.051
Education							
Unknown	79	19.1	14	38.9	1.00	Reference	
Low	136	32.9	10	27.8	1.20	0.37- 3.86	0.760
Middle	173	41.8	11	30.6	1.00	0.10-9.73	0.995
High	26	6.3	1	2.8	3.11	0.76-12.70	0.114
Occupation							
Unemployment	59	14.3	3	8.3	1.00	Reference	
Student	69	16.7	6	16.7	0.99	0.22-4.53	0.995
Employment	145	35.0	6	16.7	0.71	0.15-3.49	0.678
Labor	27	6.5	3	8.3	2.06	0.35-11.99	0.420
Others	114	27.5	18	50.0	1.59	0.32-7.78	0.567
Mode of payment							
Out of pocket	253	61.1	27	75.0	1.00	Reference	
Insurance	42	10.1	2	5.6	0.37	0.08-1.77	0.215
National health insurance	113	27.3	7	19.4	0.43	0.17-1.06	0.066
Others	6	1.4	0	0.0	NA*		
Transport to hospital							
Non ambulance	298	72.0	13	36.1	1.00	Reference	
Ambulance	116	28.0	23	63.9	1.58	0.44-5.66	0.479

*NA: not applicable

Table 2. Characteristics of accident and head injury severity

	Head injury severity				Crude odds ratio	95% Confidence interval	P
	Mild/moderate (n=414)		Severe (n=36)				
	n	%	n	%			
Time of accident							
Workday	108	26.1	5	13.9	1.00	Reference	
Holiday	306	73.9	31	86.1	2.49	0.90-6.86	0.078
Current activity							
Not work related	304	73.4	29	80.6	1.00	Reference	
Work related	110	26.6	7	19.4	1.39	0.52- 3.74	0.511
Transport to hospital							
Non ambulance	298	72.0	13	36.1	1.00	Reference	
Ambulance	116	28.0	23	63.9	1.58	0.44-5.66	0.479
State of referral							
Referred	254	61.4	9	25.0	1.00	Reference	
Not referred	146	35.3	26	72.2	3.61	0.97-13.41	0.055
Unknown	14	3.4	1	2.8	1.93	0.21-17.46	0.560
Type of medical treatment							
No surgery	341	82.4	23	63.9	1.00	Reference	
Surgery	62	15.0	11	30.6	1.49	0.61-3.66	0.374
Unknown	11	2.7	2	5.6	2.19	0.40-11.66	0.361

Table 3. The relationship between suspected alcohol or addictive narcotic use, type of accident, state of referral and the head injury severity

	Head injury severity				Adjusted odds ratio*	95% Confidence Interval	P
	Mild/moderate (n=414)		Severe (n=36)				
	n	%	n	%			
Suspected alcohol or addictive narcotic use							
No	403	97.3	33	91.7	1.00	Reference	
Yes	11	2.7	3	8.3	4.77	1.04-21.75	0.044
Type of accident							
No traffic	135	32.6	4	11.10	1.00	Reference	
Traffic	275	67.4	32	88.9	3.43	1.14-10.32	0.029
State of referral							
Referred	254	61.4	9	25.0	1.00	Reference	
No referred	146	35.3	26	72.2	5.50	2.28-13.27	0.000
Others	14	3.4	1	2.8	2.14	0.24-19.09	0.495

*Adjusted each other for variables listed in table

DISCUSSION

Limitations of this study was the data was abstracted from medical records and subject focused on hospitalization patients. Another limitation was that the data did not include information about use of safety devices, pre-hospital condition and duration time of injury incidence until medical treatment. Response time of medical treatment data was not complete so it can't be analyzed. Injury severity was diagnosed by doctors and abstraction of medical record to the registry form by trained medical record official. A limitation of source of data from medical records was a number of missing data or data was unknown.

Head injury associated with many factors that contribute to the severity of injury. In this study, the main finding was suspected alcohol and addictive narcotic use related to severe head injury. The suspected alcohol or addictive narcotic use factor was adjusted by patient referred and traffic accident factors.

In this study, using alcohol or addictive narcotic examined and/or observing the physical condition of patients at admission in emergency department. Despite we didn't examine the presence of blood alcohol in injured patient but alcohol intoxication was examined by doctors. Physical examination based on injured patient condition at admission to emergency department. One of risk factors for severity of head injury is the alcohol consumption. Almost 50% of traumatic brain-injured (TBI) patients are alcohol intoxicated.[10] Subjects who had suspected alcohol or addictive narcotic use have a higher risk compared with subjects who did not suspected alcohol or addictive narcotic use. Although alcohol increases the risk of incurring head injury, recent studies paradoxically indicate that high blood alcohol levels could improve outcome in patients with severe head injury.[11-13] In addition, driver and pedestrian errors that were related to alcohol and drug impairment also significantly contributed to severe injury.[14]

Alcohol and addictive narcotic caused health effects. As a potent central nervous system (CNS) depressant, alcohol may reduce level of consciousness and result in stupor, coma, and even death due to respiratory depression.[15] There was still much controversy about how the influence of alcohol to cure patients suffering from head and brain injury.

Our result showed that patient who was suspected alcohol and addictive narcotic use had nearly 5-fold increase the risk in severe head injury compared to not suspected. More recently, patients with severe brain injuries and high blood alcohol levels (≥ 0.08 mg/L) exhibited a significantly lesser mortality compared with patients with lower levels or the absence of alcohol in their blood.[13] Patients with positive blood-alcohol concentration (BAC) were 2.1-fold more likely to have a more severe head injury as measured on CT scan by the Marshall scores.[16] In this study, patient had suspected alcohol or addictive narcotic use more higher risk to severe head injury than an other study. Although proportion of alcohol consumption on Indonesian people very small, the alcohol was responsible for the occurrence of head injury.

In conclusion that suspected alcohol or addictive narcotic use was the highest risk to severe head injury. Campaign against alcohol and addictive narcotic should be done to prevent head injury severity.

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