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Araştırma

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Retrospective Evaluation of Patients Who Were Treated in the Intensive Care Unit Due to Road Traffic Accidents

Karayolu Trafik Kazaları Nedeniyle Yoğun Bakım Ünitesinde Takip ve Tedavi Edilen Hastaların Retrospektif Olarak Değerlendirilmesi

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ABSTRACT

Aim: We aimed to investigate intensive care unit (ICU) treatments and factors associated with mortality in patients admitted to the ICU after road traffic accidents(RTAs).

Methods: This study retrospectively analyzed patient comorbidities,-features of traumas,alcohol use,Revised Trauma Score(RTS), interventions performed,ICU and hospital stays,the presence and extent of invasive mechanical ventilation(IMV),Acute Physiology and Chronic Health Evaluation (APACHE II), Simplified Acute Physiology Scores (SAPS II), as well as Glasgow Coma Scale (GCS) and NRS 2002 (Nutritional Risk Screening 2002) scores upon admission to the ICU. Brain death rates, transfusion rates, and ICU death rates were analyzed.

Results: 90 of the 109 patients treated in the ICU for RTAs survived, and 19 patients (17.4%) died.GCS scores were lower and APACHE II scores were greater in the non-surviving patients than in the surviving patients ($p < 0.0001$). The number of patients who received cardiopulmonary resuscitation (CPR) was significantly higher in the non-surviving patient group($p < 0.0001$).The most frequent etiology of trauma was non-vehicle traffic accidents(45%).The head was the most common site of traumas(71.5%).The GCS and RTS scores of non-survivor patients were significantly lower($p = 0.013$,$p = 0.001$,respectively), and the APACHE II and SAPS II scores were higher($p < 0.001$).It was found that the rates of intubation(100%),CPR(47.4%), and IMV(100%) in non-surviving patients outweighed in surviving patients($p= 0.005$,$p < 0.001$, and $p = 0.012$,respectively).

Conclusion: Multiple parameters are influential for determining the prognoses of patients treated in the ICU for traumas caused by RTAs.In particular,a high APACHE II score and CPR requirement are associated with mortality.

Key Words: Road traffic accidents, intensive care unit, mortality

ÖZET

Amaç: Karayolu trafik yaralanması sonrası yoğun bakım ünitesine(YBÜ) kabul edilen hastalarda ybü süreçleri ve mortalite ile ilişkili faktörleri incelemeyi amaçladık.

Yöntem: Bu çalışmada retrospektif olarak hastaların komorbiditeleri, travmaların özellikleri, alkol kullanımı, Revize Travma Skoru (RTS), yapılan girişimler, yoğun bakım ve hastanede kalış süreleri, invaziv mekanik ventilasyonun (IMV) varlığı ve süresi, yoğun bakım ünitesine kabul sırasında;Akut Fizyoloji ve Kronik Sağlık Değerlendirmesi (APACHE II), Basitleştirilmiş Akut Fizyoloji Skorları (SAPS II) ve ayrıca Glasgow Koma Ölçeği (GCS) ve NRS 2002 (Beslenme Risk Taraması 2002) puanları incelendi. Beyin ölümü oranları, transfüzyon oranları ve yoğun bakım ünitesindeki ölüm oranları analiz edildi.

Bulgular: YBÜ'de RTA nedeniyle tedavi edilen 109 hastanın 90'ı hayatta kaldı ve 19 hasta (%17,4) öldü. Ölen hasta grubunda, sağ kalan hasta grubuna göre GKS skoru daha düşük ve APACHE II skorları yüksekdi ($p<0.0001$). Resusitasyon(KPR) uygulanan hasta sayısı, ölen hasta grubunda anlamlı şekilde yüksekdi ($p<0.0001$).En sık travma etyolojisi araç dışı trafik kazası idi (%45). En sık %71,5 ile kafa travması görüldü.Ölen hastaların GKS ve RTS skorları, anlamlı düzeyde düşük olup ($p:0.013$) ($p:0.001$), APACHE II ve SAPS II skorları yüksek idi ($p<0.001$). Ölen hastaların entübe edilme (%100),KPR uygulanma (%47,4) ve IMV yapılma oranını (%100), sağ kalan hastalardan anlamlı düzeyde yüksek bulduk ($p:0.005$)($p<0,001$) ($p:0.012$).

Sonuç: Karayolu trafik kazasına bağlı travma nedeniyle yoğun bakımda takip ve tedavi edilen hastaların prognoz tayininde farklı parametrelerin etkili olduğunu ve özellikle yüksek APACHE II ve KPR uygulanmasının mortalite ile ilişkili olduğu kanaatindeyiz.

Anahtar Kelimeler: Karayolu trafik kazaları, yoğun bakım ünitesi, mortalite

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Introduction

Road traffic wounds adress a crucial worldwide public health issue that can be effectively prevented, but is often neglected.[1] In our country, trauma-related deaths rank sixth among the leading causes of mortality.[2] In addition, road traffic accidents (RTAs) have the potential to result in major traumas worldwide, presenting the main cause of disease and mortality.[3] Indeed, approximately 1.2 million die and over 50 million people get injured around the world.[4,5]

A substantial number of patients with major trauma due to RTAs require monitoring and treatment in intensive care units (ICUs). Assessments of trauma severity and prognosis determination involve the use of different scores, one of which is the Revised Trauma Score (RTS).[6] The RTS is a physiologically based system that has high inter-rater accountability, indicated accuracy in estimating in-hospital mortality, and can objectively determine injury severity in trauma patients.[7,8,9] The RTS is based on bedside clinical and physiological data premised on the Glasgow Coma Score (GCS), systolic blood pressure (SBP), and respiratory rate (RR). It is calculated using the formula RTS = (0.9368 × GCS) + (0.7326 × SBP) + (0.2908 × SS) and takes a value in the range of 0 and 7.8408.

We aimed to investigate the intensive care course and elements related with fatality in patients admitted to the ICU following road traffic injuries.

Methods

After obtaining ethical approval from our hospital's ethics committee (Approval No: E-17073117-050.06), we retrospectively evaluated the medicinal records of patients stayed in the ICU of Health Sciences University Fatih Sultan Mehmet Training and Research Hospital between January 1, 2013, and May 31, 2021, following RTAs. We included 109 patients aged 18 and older who admitted to the ICU for over 24 hours, excluding patients under 18 and those who died in the emergency department.

We collected data on age, gender, comorbidities, trauma etiology (motor vehicle accidents, non-vehicle traffic accidents, motorcycle accidents), trauma region (head, neck, chest, abdominal, extremity, pelvis), alcohol use, single or multiple traumas, Revised Trauma Score (RTS), the need for surgery due to traffic accidents, initial intubation, APACHE II (Acute Physiology and Chronic Health Evaluation) score upon initial admission to the ICU, SAPS II (Simplified Acute Physiology Score), and GCS and NRS 2002 (Nutritional Risk Screening 2002) scores. Additionally, we recorded initial albumin, hemoglobin, and platelet levels and administered albumin, ES, platelet transfusions, and FFP replacements. We also noted the presence of CPR, tube thoracostomy, and hemodialysis (HD), the duration of stay in the ICU, the presence and duration of IMV, the presence of brain death, the method of discharge from the ICU, and mortality rates.

Results

In our study; 5,557 patients were treated in our ICU over eight years, and 109 (1.96%) of these patients were treated for trauma resulting from RTAs. The mean age of the patients was 35.4 ± 16.85, with 91 (83.5%) male and 18 (18.5%) female. We found that 31 (28.4%) patients had motor vehicle accidents, 49 (45%) had pedestrian accidents, and 29 (26.6%) had motorcycle accidents. Hypertension was the most common comorbid illness observed in 16 (14.7%) of the patients. Head trauma was the most frequent injury, occurring in 78 (71.5%) of cases. Multiple traumas were present in 79 (72.5%) of the patients. The demographics, comorbidities, trauma regions, and interventions performed are summarized in Table 1.

The mean scores of GCS, RTS, APACHE II, SAPS II, and NRS 2002 upon admission to our ICU are presented in Table 1. The mean albumin level on the first day of ICU admission was 3.4 ± 0.73, with an average of 3.24 ± 7.85 albumin replacements.

The mean hemoglobin and platelet levels on the first day of ICU admission were 11.92 ± 2.49 and 214.14 ± 76.46, respectively, with an average of 2.13 ± 3.08 erythrocyte suspension (ES) replacements and 0.18 ± 1.58 platelet replacements. The mean number of FFP replacements was 1.72 ± 2.68. Hemodialysis was performed in 1.8% of the patients, and IMV was administered to 78% of the patients.

Our patients' average hospitalization length was 10.97 ± 13.89 days, with an average stay in ICU of 10.28 ± 13.45 days and an average IMV duration of 6.47 ± 9.85 days.

While 81.7% of our patients were successfully treated and discharged to the ward, 17.4% unfortunately passed away, and one patient became a care case (0.9%). Brain death was detected in 3.7% of the patients.

When we analyzed the patients treated and followed in the ICU after RTAs as two groups, survivors and non-survivors, no significant differences were observed in demographic data, comorbidity presence, alcohol usage, trauma location, and number of traumas. However, non-survivors had notably lower GCS and RTS scores compared to survivors (p: 0.013, p: 0.001, respectively), and we observed higher APACHE II and SAPS II scores in non-survivors (p: 0.000, p: 0.000, respectively). See Table 2.

Table 3 presents the average values of interventions performed, initial admission albumin levels, the amount of

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Table 1. Patient, trauma characteristics and evaluation of scores at first presentation

		n	%
Comorbidities	Hypertension	16	14,7
	Diabetes Mellitus	9	8,3
	Cardiac Disease	7	6,4
	Lung Disease	8	7,3
	Rheumatological	8	7,4
	Neurological	5	4,6
Trauma Sites	Head Trauma	78	71,5
	Chest Trauma	45	41,3
	Abdominal Trauma	20	18,3
	Neck Trauma	5	4,5
	Extremity Trauma	43	39,4
	Pelvic Trauma	19	17,4
Number of trauma sites	Single trauma	30	27,5
	Multiple traumas	79	72,5
Arrival Intubated	Yes	32	29,4
	No	77	70,6
Tube Thoracostomy	Yes	90	82,6
	No	19	17,4
Surgery	Yes	61	56,0
	No	48	44,0
Alcohol Use	Yes	91	83,5
	No	18	16,5
Cardiopulmonary Resuscitation	Yes	96	88,1
	No	13	11,9
Scores	Min-Max	Mean ± SD	Median
GCS	3-15	10.29±4.11	11
RTS	1-8	6.58±1.46	7
APACHE II	2-41	16.61±9.14	15
SAPS II	3-86	31.59±18.18	29
NRS 2002	0-6	0.93±1.25	0

GCS: Glasgow Coma Scale RTS: Revised Trauma Score APACHE II: Acute Physiology and Chronic Health Evaluation SAPS II: Simplified acute physiology score NRS 2002: Nutrition Risk Screening 2002

administered albumin, initial admission hemoglobin (Hb) levels, the number of administered ES, platelet levels, the number of administered platelet suspensions, FFP given, the presence of IMV, the number of days of IMV, ICU stay days, and hospital stay days in survivors and non-survivors in the ICU.

We observed higher rates of endotracheal intubation, CPR, and IMV application in non-surviving patients in comparison to survivor ones(p: 0.005, p: 0.000, and p: 0.012, respectively). Additionally, initial admission albumin levels in the ICU were lower in surviving patients (p: 0.015), and the number of administered FFP units was greater in surviving patients (p: 0.046). See Table 3.

Having evaluated the effects of GKS, RTS, APACHE II, SAPS II, CPR, IMV presence, IMV days, albumin, number of administered FFP, initial intubation, and brain death parameters on mortality through logistic regression analysis, it was found that the model was significant ($p < 0.05$) and Nagelkerke R square value was 0.592 that indicated a good level of explanatory power (90%). The impact of the APACHE II score was significant ($p < 0.05$), with a higher APACHE II score associated with a 1.158 times increase in

Table 2. Comparison of surviving and non-survivoring patients

		Survivors (n=90)	Non-survivors (n=19)	
		n (%)	n (%)	p
Gender	Male	75 (83.3%)	16 (84.2%)	[1]1.000
	Female	15 (16.7%)	3 (15.8%)	
Age Mean ± SD (median %)		34.41±16.4 (30.5%)	40.11±18.56(36%)	[2]0.196
Alcohol Use	Yes	75 (83.3%)	16 (84.2%)	[1]1.000
	No	15 (16.7%)	3 (15.8%)	
Trauma Etiology	Vehicle collision	25 (27.8%)	6 (31.6%)	[3]0.829
	Pedestrian accident	40 (44.4%)	9 (47.4%)	
	Motorcycle accident	25 (27.8%)	4 (21.1%)	
Comorbidities	Hypertension	11 (12.2%)	5 (26.3%)	[1]0.150
	Diabetes Mellitus	8 (8.9%)	1 (5.3%)	[1]1.000
	Cardiac Disease	4 (4.4%)	3 (15.8%)	[1]0.100
	Lung Disease	8 (8.9%)	0 (0%)	[1]0.346
	Thyroid Disease	4 (4.4%)	0 (0%)	[1]1.000
	Neurological	4 (4.4%)	1 (5.3%)	[1]1.000
	Rheumatological	4 (4.4%)	0 (0%)	[1]1.000
Trauma Sites	Head Trauma	64 (71.1%)	14 (73.7%)	[4]1.000
	Chest Trauma	34 (37.8%)	11 (57.9%)	[4]0.173
	Abdominal Trauma	17 (18.9%)	3 (15.8%)	[1]1.000
	Neck Trauma	5 (5.6%)	0 (0%)	[1]0.584
	Extremity Trauma	39 (43.3%)	4 (21.1%)	[4]0.122
	Pelvic Trauma	15 (16.7%)	4 (21.1%)	[1]0.740
Number of trauma sites	Single trauma	24 (26.7%)	6 (31.6%)	[4]0.878
	Multiple traumas	66 (73.3%)	13 (68.4%)	
Scores	GCS Mean ± SD (median %)	10.81±3.67 (11%)	7.84±5.21 (6%)	[2]0.013*
	RTS Mean ± SD (median %)	6.86±1.15 (7%)	5.26±2.02 (5%)	[2]0.001*
	APACHE II Mean ± SD (median %)	14.24±7.58 (14%)	27.84±7.47 (28%)	[2]0.000*
	SAPS II Mean ± SD (median %)	26.78±14.06 (25.5%)	54.37±18.51 (51%)	[2]0.000*
	NRS 2002 Mean ± SD (median %)	0.79±1.06 (0%)	1.58±1.77 (2%)	[2]0.110

[1]Fisher's Exact Test
[2]Mann Whitney U Test
[3]Chi-squared test
[4]Yates continuity correction *p<0.05
GCS: Glasgow Coma Scale RTS: Revised Trauma Score APACHE 2: Acute Physiology and Chronic Health Evaluation
SAPS 2: Simplified acute physiology score NRS 2002: Nutritional Risk Screening 2002

mortality. On the other hand, the application of CPR had a remarkable impact on mortality increasing by 5.526 times. It was observed that the effect of the SAPS 2 score was 1.047 times increse in mortality whereas it was not statistically significant (borderline significant).

Statistical Analysis

IBM SPSS Statistics 22 software was used for the statistical analyses. The normal distribution of data was evaluated using the Shapiro–Wilk test.The Mann–Whitney U test

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Table 3. Interventions, laboratory values, transfusion amounts, and ICU data of surviving and non-survivoring patients

n (%)		Survivors (n=90) n (%)	Non-survivors(n=19)	p
Interventions	Arrival Intubated	58 (64.4%)	19 (100%)	[1]0.005*
	Tube Thoracostomy	16 (17.8%)	3 (15.8%)	[2]1.000
	Surgery	39 (43.3%)	9 (47.4%)	[1]0.946
	Cardiopulmonary Resuscitation	4 (4.4%)	9 (47.4%)	[2]0.000*
	Hemodialysis	1 (1.1%)	1 (5.3%)	[2]0.320
	Invasive Mechanical Ventilation	66 (73.3%)	19 (100%)	[2]0.012*
Albumin Mean ± SD (median%)		3.48±0.69 (3.5%)	3±0.79 (3.1%)	[3]0.015*
Number of Administered Albumin Doses Mean ± SD (median%)		2.93±7.56 (0%)	4.68±9.2 (0%)	[3]0.165
Hemoglobin Mean ± SD (median%)		11.96±2.43 (12.5%)	11.72±2.81 (12.2%)	[3]0.789
Erythrocyte Suspensions Transfused Mean ± SD (median%)		1.94±2.94 (1%)	3±3.67 (2%)	[3]0.240
Thrombocyte Count Mean ± SD (median%)		212.19±66.08 (209%)	223.37±115.65 (224%)	[3]0.949
Thrombocytes Transfused Mean ± SD (median%)		0.04±0.42 (0%)	0.84±3.67 (0%)	[3]0.216
Fresh Frozen Plasma Transfused Mean ± SD (median%)		1.44±2.42 (0%)	3±3.48 (2%)	[3]0.046*
Days on Invasive Mechanical Ventilation Mean ± SD (median%)		5.92±9.65(2%)	9.05±10.65 (5%)	[3]0.018*
ICU stay (days) Mean ± SD (median%)		10.54±14.01 (5%)	9.05±10.65 (5%)	[3]0.694
Hospital stay (days) Mean ± SD (median%)		11.61±14.57 (6%)	7.95±9.87 (4%)	[3]0.164

[1]Yates continuity correction
[2]Fisher's Exact Test
[3]Mann Whitney U Test
ICU:Intensive care unit

was used for comparisons between the two groups for parameters that did not show a normal distribution. The chi-square test, Yates continuity correction, and Fisher's exact test were used to compare qualitative data. Logistic regression analysis was used for the multivariate analysis, with the significance set at $p < 0.005$.

Discussion

RTAs are among the leading causes of death in patients admitted to the ICU. In our study, we found that injuries resulting from RTAs were more common in young male patients, with head injuries occurring most frequently. Compared to the group of patients who survived, the non-survivors had lower GCS and RTS scores but higher APACHE II and SAPS II scores, and used IMV for a longer period of time. We also noted that all patients who did not survive required IMV.

In a retrospective stdudy conducted by Bener et al. who investigated the frequency and severity of head and neck injuries in 6,709 patients involved in RTAs, they found that the proportion of male patients was 85.9%.[10]

In Chelly et al.'s analysis of 694 patients treated in the ICU for head trauma following traffic accidents, they found 592 male patients (85.3%) and 102 female patients. This results in a mal/female ratio of 5.8.[11]

In Pogorzelski et al.'s retrospective study, where they analyzed the epidemiology, prognostic factors, and conse-

quences of trauma ICU patients, they determined that the proportion of male patients was 83%. Additionally, they found that patients had head trauma with 71%, chest trauma with 37 %, and abdominal trauma with 21%.[12]

Likewise, 83.5% of the participants were male, and 18.5% were female in our study. The ratio of male to female was 5.05. The age range was 35.4 ± 16.85. We observed that 71.5% of the patients had head trauma, 41.3% had chest trauma, and 18.3% had abdominal trauma. Additionally, we found that 45% of the patients were involved in non-vehicle traffic accidents (NVTA), 28.4% in vehicle traffic accidents (IVTA), and 26.6% in motorcycle accidents.

Accoridng to the study carried out by Adıyaman et al., it was found out that APACHE II score was considerbly greater in non-surviving paients.[13]

In a retrospective study, Yazar et al. examined the elements influencing mortality in 150 trauma patients who received treatment in the ICU. They found that the GCS value in surviving patients was higher than in non-survivors.[14]

Papadimitrio et al.'s retrospective study investigated mortality markers in 326 trauma patients and they found out that the GCS value was greater in survivors.[15]

In the retrospective study conducted by Chelly et al., they examined the clinical characteristics and prognoses of ICU patients who had head trauma in RTA. It was stated that GCS score was <8 and it was related with poor prognosis. They also found a good correlation between SAPS II and mortality. Surviving patients had lower SAPS II scores compared to those who died.[11]

Ünlü et al. performed retrospective research in which they used RTS scores in order to determine prognoses in 349 trauma patients and they found that the RTS score was lower in non-surviving patients.[6]

In a retrospective study by Yousefzadeh-Chabok et al. with 352 patients, they compared the various scores and it was found that the average TRISS and RTS scores were higher in surviving patients than in non-surviving patients.[9]

Zhao Xj et al.'s retrospective work examined the factors influencing mortality in 3,361 ICU patients with multitrauma and coma and they concluded that RTS values, similar to GCS values, are linked to mortality and it is significant to use these scoring systems in order to manage trauma rapidly and effectively.[16]

Reviewing the literature, we found that APACHE II and SAPS II values were higher and GCS and RTS values lower in non-survivors compared with the survivor group.We discovered that low RTS values were associated with mortality.

In Kara et al.'s retrospective study with 108 patients to analyze the variables influencing mortality in trauma patients, they found that the ratios and amounts of ES, FFP, and albumin replacement were higher in the non-surviving patients. They found that the rate of patients undergoing CPR with cardiac arrest for any reason in the pre-ICU or in the ICU was higher in the non-surviving patients. Moreover, they found that 90 % or p: 0.006 was the rate of IMV application in the non-survivors.[17]

In the retrospective study of Atrash et al., they examined the relationship between albumin levels and mortality in critically ill patients and found out that there was a close link between hypoalbuminemia and increased ICU mortality.[18]

In our study, the albumin levels of the non-survivors were considerably lower than those of the surviving patients (p: 0.015).

The retrospective study conducted by Taşdemir et al. with 117 trauma patients found an approximate IMV application rate as 53%. They observed a higher need for IMV and a longer duration of IMV in the non-surviving patients.[19]

Accoding to our study, IMV was administered in 78% of the patients, and 100 % of the non-survivors were admitted to the ICU on the first day. Those were intubated and receieved IMV support (p: 0.005, p: 0.012). We also observed a longer staying period in IMV in non-surviving patients when it was compared to those surviving patients (p: 0.018).

The literature has noted that invasive procedures and blood transfusions are frequently administered in patients whose overall health and trauma scores were poor.[20,21] Subsequently, it has been observed that mortality, coagulopathy, and sepsis rates are significantly increased in these patients.[20]

In our study, the number of FFP units administered to the patients who passed away was markedly higher than the surviving patients (p: 0.046). The number of erythrocyte suspension, platelet transfusions, and albumin administrations were very similar to both groups. We believe that the different patient numbers in the study groups may have contributed to these varying results.

In addition, we found that the ratio of CPR performed in passed away patients was 47.4% and 4.4% in surviving patients (p: 0.000) that the difference was noticeably high. Thus, our study indicated that the application of CPR was associated with a higher mortality rate.

The limitations of our research include the fact that our study is retrospective and the relatively small sample size of patients.

In conclusion, we found that in patients treated in the ICU for RTA-related traumas, especially high APACHE II scores and the application of CPR were associated with mortality.

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Consistent with the literature, in our study, nonsurviving patients had higher APACHE II scores and lower GCS and RTS values compared to the surviving patient group. Correspondingly, we believe that the APACHE II score, which is routinely used for determining mortality in the trauma patients we follow and treat in the ICU, can guide us effectively.

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References

1. Razzaghi A, Soori H, Abadi A, Khosravi A. World Health Organization's estimates of death related to road traffic crashes and their discrepancy with other countries' national report. J Inj Violence Res. 2020;6;12(3):39–44. doi: 10.5249/jivr.v12i3.1425.
2. T.C. İstatistik Kurumu Başkanlığı (TÜİK) Haber Bülteni. Ölüm Nedeni İstatistikleri, 2019 Verileri. Sayı: 33710, 24.06. 2020 Erişim: 24.06.2020 https://data.tuik.gov.tr/Bulten/Index?p=Olum-ve-Olum-Nedeni-Istatistikleri-2019-33710
3. Shamim M. Pattern of Injuries from Road Traffic Accidents Presented at a Rural Teaching Institution of Karachi. Indian J Surg. 2017;79(4):332-7. doi: 10.1007/s12262-017-1605-3.
4. Bacchieri G, Barros AJ. Traffic accidents in Brazil from 1998 to 2010: many changes and few effects. Rev Saude Publica. 2011;45(5):949-63. doi: 10.1590/s0034-89102011005000069.
5. Moafian G, Aghabeigi MR, Heydari ST, Hoseinzadeh A, Lankarani KB, Sarikhani Y. An epidemiologic survey of road traffic accidents in Iran: analysis of driver-related factors. Chin J Traumatol. 2013;16(3):140-4. PMID: 23735547.
6. Ünlü AR, Ülger F, Dilek A, Barış S, Murat N, Sarıhasan B. Evaluation of the Relationship Between Revised Trauma Score, and Trauma and Injury Severity Scores with Prognosis of Trauma Patients in Intensive Care Unit. Türk Anest Rean Der Dergisi. 2012;40(3):128-35. doi: 10.5222/JTAICS.2012.128.
7. Galvagno SM Jr, Massey M, Bouzat P, Vesselinov R, Levy MJ, Millin MG, et al. Correlation Between the Revised Trauma Score and Injury Severity Score: Implications for Prehospital Trauma Triage.Prehosp Emerg Care. 2019;23(2):263-70. doi: 10.1080/10903127.2018.1489019.
8. Norouzi V, Feizi I, Vatankhah S, Pourshaikhian M. Calculation of the probability of survival for trauma patients based on trauma score and the injury severity score model in fatemi hospital in ardabil. Arch Trauma Res. 2013;2(1):30-5. doi: 10.5812/atr.9411.
9. Yousefzadeh-Chabok S, Hosseinpour M, Kouchakinejad-Eramsadati L, Ranjbar F, Malekpouri R, Razzaghi A, et al.Comparison of Revised Trauma Score, Injury Severity Score and Trauma and Injury Severity Score for mortality prediction in elderly trauma patients. Ulus Travma Acil Cerrahi Derg. 2016;22(6):536-40. doi: 10.5505/tjtes.2016.93288.
10. Bener A, Rahman YS, Mitra B. Incidence and severity of head and neck injuries in victims of road traffic crashes: In an economically developed country. Int Emerg Nurs. 2009;17(1):52-9. doi: 10.1016/j.ienj.2008.07.007.
11. Chelly H, Bahloul M, Ammar R, Dhouib A, Mahfoudh KB, Boudawara MZ, et al. Clinical characteristics and prognosis of traumatic head injury following road traffic accidents admitted in ICU "analysis of 694 cases". Eur J Trauma Emerg Surg. 2019;45(2):245-53. doi: 10.1007/s00068-017-0885-4.
12. Pogorzelski GF, Silva TA, Piazza T, Lacerda TM, Spencer Netto FA, Jorge AC,et al. Epidemiology, prognostic factors, and outcome of trauma patients admitted in a Brazilian intensive care unit. Open Access Emerg Med. 2018;10:81-8. doi: 10.2147/OAEM.S162695.
13. Adıyaman E, Tokur ME, Bal ZM, Gökmen AN,Koca U. Retrospective Analysis of Trauma Patients Who were Treated and Followed in Anesthesia Intensive Care Unit. Turkish J Intensive Care. 2019;17(3):146-53. doi: 10.4274/tybd.galenos.2018.82905.
14. Yazar MA, Sarıkuş Z, Horasanlı E. Thirty-day Mortality Outcomes of Trauma Patients in the Intensive Care Unit: A Three-year Retrospective Study. Turk J Intensive Care. 2019;17(1):18-24. doi: 10.4274/tybd.galenos.2018.75437.
15. Papadimitriou-Olivgeris M, Panteli E, Koutsileou K, Boulovana M, Zotou A, Marangos M, et al. Predictors of mortality of trauma patients admitted to the ICU: a retrospective observational study.Braz J Anesthesiol. 2021;71(1):23-30. doi: 10.1016/j.bjane.2020.12.006.
16. Zhao XJ, Kong LW, DU DY, Su HJ. Analysis on care outcome of patients with polytrauma and coma. Chin J Traumatol. 2007;10(1):53-8. PMID: 17229352.
17. Kara İ, Altınsoy S, Gök U, Onur A, Sarıbapıccı R. Mortality Analysis of Trauma Patients in General Intensive Care Unit of a State Hospital. Türk Yogun Bakim Dernegi Dergisi. 2015;13(2):68-74. doi: 10.4274/tybdd.54154.
18. Atrash AK, de Vasconcellos K. Low albumin levels are associated with mortality in the critically ill: A retrospective observational study in a multidisciplinary intensive care unit. South Afr J Crit Care. 2020;36(2):74-9. doi: 10.7196/SAJCC.2020.v36i2.422.
19. Taşdemir BB, Tüfek D, Sıvacı R, Doğan İ. Retrospective Analysis of the Prognosis in Trauma Patients Followed up in Intensive Care Unit. Turkiye Klinikleri J Anest Reanim. 2017;15(3):89-94. doi: 10.5336/anesthe.2017-56978.
20. Wafaisade A, Wutzler S, Lefering R, Tjardes T, Banerjee M, Paffrath T, et al. Trauma Registry of DGU. Drivers of acute coagulopathy after severe trauma: a multivariate analysis of 1987 patients. Emerg Med J. 2010;27(12):934-9. doi: 10.1136/emj.2009.088484.
21. Pape HC, Moore EE, McKinley T, Sauaia A. Pathophysiology in patients with polytrauma. Injury. 2022;53(7):2400-12. doi: 10.1016/j.injury.2022.04.009.