Evaluation of firearm injuries by trauma scoring systems in a secondary health care institution

 Resul Nusretoğlu, M.D.,[1] Yunus Dönder, M.D.,[2] İsmail Biri, M.D.,[3] Yücel Gültekin, M.D.[4]

[1]Deparment of General Surgery, Hakkari Yüksekova State Hospital, Hakkari-*Türkiye*
[2]Deparment of General Surgery, Kayseri City Training and Research Hospital, Kayseri-*Türkiye*
[3]Deparment of General Surgery, Koru Ankara Hospital, Deparment of General Surgery, Ankara-*Türkiye*
[4]Deparment of General Surgery and Division of Intensive Care, Osmaniye State Hospital, Osmaniye-*Türkiye*

ABSTRACT

BACKGROUND: Scoring systems are widely used in trauma patients and are very important in the care of trauma patients. The objective of this study was to investigate the effectiveness of scoring systems in evaluating the patients who were brought to a hospital without a trauma center due to firearm injuries (FIs) using scoring systems, and the efficacy of these systems in identifying patients who should be treated in a trauma center.

METHODS: Patients brought to Hakkari Yüksekova State Hospital due to FIs between January 2010 and December 2019 were retrospectively investigated. Patients aged 16 and over were included in the study. Patients who were brought to the hospital while deceased and those who did not respond to cardiopulmonary resuscitation in the hospital were excluded from the study. In addition, patients who underwent simple outpatient medical intervention were not included in the patient group. Patients were evaluated demographically. The mortality predictions of trauma scoring systems, which are widely used in the evaluation of trauma patients, were examined. In addition, the effectiveness of scoring systems in identifying patients who should be treated in trauma centers was investigated.

RESULTS: In the study, 331 patients, 96.9% of whom were male, were evaluated. The patient group consisted of young patients and the median age was 27 (IQR, 24–29) years. A total of 74 (22.4%) patients were referred to trauma referral hospitals for diagnosis and treatment. Mortality occurred in 46 (13.9%) patients. Glasgow coma scale, injury severity score (ISS), revised trauma score, new trauma score, and trauma revised ISS were found effective for predicting mortality in patients, and scoring systems were correlated with each other. However, scoring systems were not found effective in distinguishing patients who should be treated in a trauma center.

CONCLUSION: Scoring systems are significant in predicting mortality of patients with gunshot wounds. However, trauma scoring systems have not been found to be effective in distinguishing patients who require referral to a trauma center.

Keywords: Mortality; scoring systems; trauma.

INTRODUCTION

Trauma-related deaths around the world cause more deaths each year than deaths from malaria, HIV, and tuberculosis combined.[1] Scoring systems have an important place in the diagnosis and treatment of patients in the management of trauma, which we encounter as an important epidemiological problem. Nearly 50 scoring systems have been defined for the evaluation of trauma patients in emergency and intensive care units.[2] These systems are basically divided into two groups, anatomical and physiological. Among the commonly used scoring systems, abbreviated injury scale and injury severity score (ISS) are anatomical, Glasgow coma scale (GCS) and revised trauma score (RTS) are physiological trauma scoring systems. Trauma revised ISS (TRISS) is accepted as a combined scoring system. These systems do not require advanced medical devices and tests. They provide very useful informa-

tion about the triage of patients and the degree of trauma in pre-hospital settings and emergency rooms. Thanks to these scoring systems, complex and variable patient data can be reduced to a single number.

Firearm injuries (FIs) are more complicated injuries with higher mortality and morbidity rates than other blunt and penetrating injuries due to their high kinetic energy. Advanced injuries occur due to the transfer of higher levels of energy as a result of trauma with high kinetic energy agents compared to other traumas. In such traumas, the energy can cause damage by passing through various tissues until it disappears with absorption.[3]

The most important problem in health centers that first encounter trauma is the triage of the trauma patient. Determining which patient's treatment will need to be continued in a higher center constitutes the main problem of these health centers. However, most of the studies on FIs have been done by trauma centers. Therefore, the results of the studies conducted in trauma centers are limited in terms of being a reference for health centers that encounter the trauma first and whose facilities and staff are not sufficient.

In this study, the objective was to investigate the effectiveness of scoring systems in a district state hospital, where FIs frequently occur and where such traumas are initially encountered, by demographic and scoring systems and to distinguish patients who should be treated in a trauma center.

MATERIALS AND METHODS

This is a retrospective cohort study where patients brought to Hakkari Yüksekova State Hospital due to FIs between January 1, 2010, and December 31, 2019, were investigated. Patients aged 16 and over were included in the study. Patients under the age of 16, those who were brought to the hospital while deceased, and those who did not respond to cardiopulmonary resuscitation in the hospital were excluded from the study. In addition, patients who underwent simple outpatient medical intervention were not included in the patient group. The sex, age, blood pressure, respiratory rate, pulse, SPO_2, injury site, and injured organs of the patients were recorded. In addition, the patients who were referred and their latest status in the hospital where they were transferred were noted. Patient information was obtained from the hospital information management system, patient files, and patient relatives. ISS,[4] GCS,[5] RTS,[6] and TRISS,[7] which are widely used in the evaluation of trauma patients, were calculated by MDApp® application, taking into account anatomical and physiological criteria. In addition, "The New Trauma Score" (NTS) described by Jeong et al.[8] was evaluated in the study.

The study was approved by the Van Regional Training and Research Hospital Non-Interventional Ethics Committee.

Statistical Analysis

Statistical analysis was performed using SPSS-15 (SPSS, Inc., Chicago, IL). The compliance of the variables to normal distribution was examined visually (histogram and probability charts) and analytically (Kolmogorov/Smirnov/Shapiro–Wilk tests). Descriptive statistics were given using mean and standard deviations for normally distributed variables, and median and interquartile range for non-normally distributed variables. Student's t-test was used for normally distributed data, and Mann–Whitney U-test was used for non-parametric variables. Correlation between scoring systems was examined using Pearson/Spearman correlation tests. Mortality prediction of scoring systems was evaluated by receiver operating characteristic (ROC) analysis. In the presence of significant values, the specificity and sensitivity of these limits were calculated. In the evaluation of the area under the curve, cases with Type-1 error level below 5% were considered statistically significant.

RESULTS

Between January 1, 2010, and December 31, 2019, 369 patients were brought to the Hakkari Yüksekova State Hospital due to FIs. Six patients admitted for FIs were accepted as exitus at the time of their presentation. Eight patients underwent cardiopulmonary resuscitation in the emergency department, did not respond, and were declared exitus. Simple medical intervention was applied to 24 patients and they were discharged from the emergency. A total of 331 patients who were hospitalized and whose initial diagnosis and treatments were made in that hospital, or who were referred to trauma centers afterwards were evaluated. The patient group consisted of 321 (96.9%) males and 10 (3.1%) females, with a median age of 27 (IQR, 24–29) years. Surgical intervention was performed in a total of 212 (64%) patients. The number of patients who died during follow-up and treatment was 46 (13.9%). Mortality occurred in 37 (14.4%) of 257 patients who were hospitalized. Seventy-four (22.4%) patients were referred to a higher diagnosis and treatment center due to lack of medical equipment and personnel or medical reasons.

Table 1. The injury sites of the patients, and the distribution of mortality according to these sites

Injury type	All patient	Died patient
Multiple injury, n (%)	61 (19)	22
Isolated injuries, n (%)		
Head	28 (8.7)	11
Face	9 (2.8)	–
Neck	12 (3.7)	–
Thorax	45 (13.6)	2
Abdomen	48 (14.0)	10
Extremity	102 (31.8)	1
Others	26 (8.1)	–

Table 2. Scores of living and deceased patients

	Survived patient	Died patient	p-value
	Median (IQR)	Median (IQR)	
GCS	15 (15–15)	5 (3–9)	<0.001
ISS	16 (8–25)	34 (25–50)	<0.001
RTS	7.84 (7.55–7.84)	4 (2.80–5.41)	<0.001
TRISS	98.54 (95.97–99.13)	28.70 (10.08–62.63)	<0.001
NTS	9.81 (9.06–10.68)	4.21 (2.94–5.88)	<0.001

GCS: Glasgow Coma Scale; ISS: Injury Severity Score; RTS: Revised Trauma Score; TRISS: Trauma Revised Injury Severity Score; NTS: The New Trauma score.

Table 3. Scores of hospitalized and referred patients

	Patients treated in hospital	Patients refered to trauma centers	p-value
	Median (IQR)	Median (IQR)	
GCS	15 (13–15)	15 (11.5–15)	0.068
ISS	16 (9–25)	25 (8–32)	0.282
RTS	7.10 (7.55–7.84)	7.84 (6.61–7.84)	0.122
TRISS	98.54 (95.22–99.07)	97.03 (83.64–99.13)	0.232
NTS	9.21 (9.21–10.68)	9.21 (7.23–10.28)	0.159

GCS: Glasgow Coma Scale; ISS: Injury Severity Score; RTS: Revised Trauma Score; TRISS: Trauma Revised Injury Severity Score; NTS: The New Trauma score.

Table 4. Mortality prediction of scoring systems of patients admitted to hospital with firearm injuries

	Cut-off	AUC	Sensitivite %	Spesivite %
GCS	11	0.918	81.8	83.5
ISS	21.5	0.889	97	67.7
RTS	6.39	0.939	81.8	95.2
TRISS	84.31	0.953	84.8	95.2
NTS	7.62	0.938	84.4	81.1

GCS: Glasgow Coma Scale; ISS: Injury Severity Score; RTS: Revised Trauma Score; TRISS: Trauma Revised Injury Severity Score; NTS: The New Trauma score.

Table 5. Mortality prediction of scoring systems in referred patients

	Cut-off	AUC	Sensitivite %	Spesivite %
GCS	12.5	0.822	76.5	86
ISS	8.5	0.836	94.1	63.2
RTS	7	0.862	82.4	80.7
TRISS	88.7	0.892	76.5	87.7
NTS	8.22	0.859	76.5	84.2

GCS: Glasgow Coma Scale; ISS: Injury Severity Score; RTS: Revised Trauma Score; TRISS: Trauma Revised Injury Severity Score; NTS: The New Trauma score.

The number of patients who died in the referred treatment centers was 9 (12.2%). There was no difference between the patients who died and who survived in terms of age (p=0.91) and sex (p=0.96). There was no difference in mortality between hospitalized and referred patients (p=0.62). The injury sites of the patients are presented in Table 1. Scores of living and deceased patients were compared, and the difference between scores of the groups was evaluated as significant (Table 2). There was no statistically significant difference in scores between referred patients and non-referred patients (Table 3).

ROC analysis was performed to evaluate the mortality prediction of scoring systems and for the cutoff value (Figs. 1a and b, Tables 4 and 5). Correlations between scoring systems
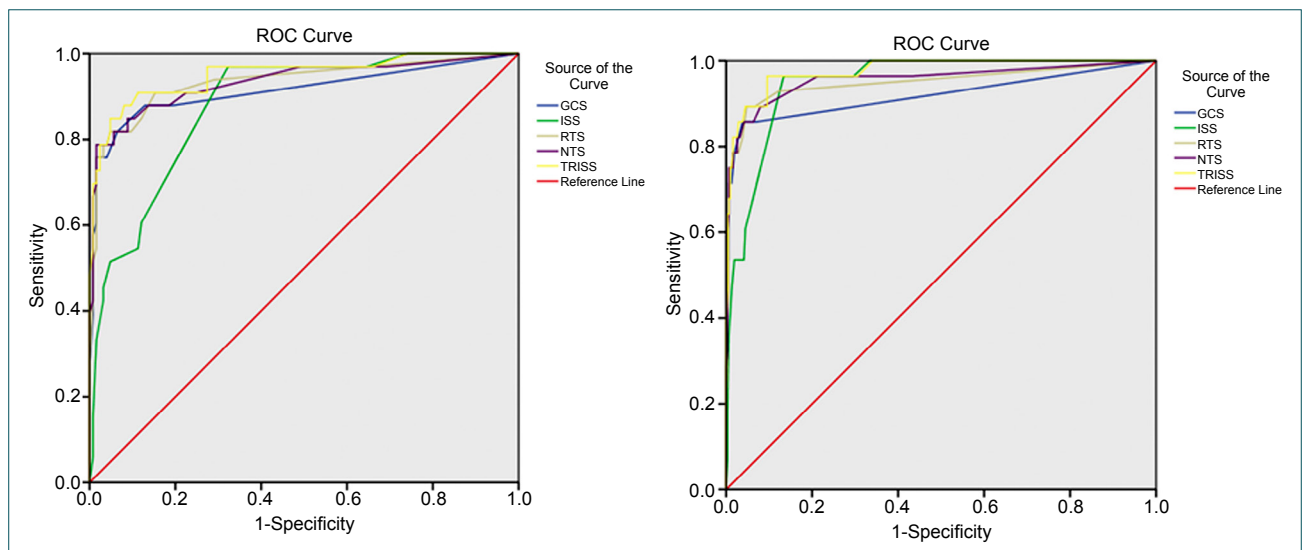

Figure 1. (a) Comparison of the scores of the patients admitted to the hospital with the ROC curve and **(b)** comparison of the scores of the referred patients with the ROC curve.

Table 6. Evaluation of correlations of patients admitted to the hospital with firearm injuries

	GCS	ISS	RTS	TRISS	NTS
GCS	r=1.0	r=−0.557	r=0.872	r=0.766	r=0.849
ISS	r=−0.557	r=1.0	r=−0.622	r=−0.924	r=−0.678
RTS	r=0.872	r=−0.622	r=1.0	r=0.844	r=0.852
TRISS	r=0.766	r=−0.924	r=0.844	r=1.0	r=0.833
NTS	r=0.849	r=−0.678	r=0.852	r=0.833	r=1.0

GCS: Glasgow coma scale; ISS: Injury severity score; RTS: Revised trauma score; TRISS: Trauma revised injury severity score; NTS: New trauma score.

were evaluated. Each scoring system was found to be significantly correlated with the other. However, the correlation of ISS with other scoring systems except TRISS was significant, but weaker (Table 6).

DISCUSSION

High kinetic energy FIs due to non-war terrorist attacks continue to be a problem for many countries. In these cases, triage is the main problem at the scene of the event and in the first admission hospitals. Unfortunately, there is still no effective method to distinguish which patient should be referred to a trauma center. Scoring systems are mostly used in this regard. In this study, scoring systems commonly used in trauma management were evaluated. GCS, ISS, RTS, NTS, and TRISS scoring systems were found to be effective in predicting the mortality of FI patients. However, it was observed that scoring systems were not determinative in the differentiation of patients who need to be referred to a trauma center.

Globally, young males in their 20s are the most frequently exposed group to FIs.[9,10] Mortality rate is higher in elderly patients due to age and increased comorbidities.[11] However, age and sex were not found to be effective on mortality in this study. This situation was attributed to the fact that the patient group consisted of young patients and mostly male patients.

It has been reported that the hospital mortality rate in FIs is 3 times higher than in general trauma patients.[12] Abe et al.[13] found the overall mortality rate as 3.7% in their studies evaluating all trauma patients. However, in their study involving only FI patients, Turgut et al. stated the mortality rate as 17.6%.[14] Pleg et al.[15] reported the mortality rate as 7.8% in FI, while Eriş et al.[16] reported the mortality rate as 15.1%. In this study, the mortality rate in hospitalized patients was 14.4% while it was 12.2% in referred patients. These results were evaluated to be in accordance with the literature.[9,17,18]

Köksal et al.[17] conducted their studies in a Level 1 trauma center and the median values of GCS, ISS, and RTS in their deceased patients were found to be 3, 36, and 3, respectively,

and their mortality rate was 12.6%. In this study, the GCS, ISS, and RTS in the patients who died were 5, 34, and 4, respectively. The trauma scores of the patients who died in the studies of Köksal et al. were consistent with the trauma scores of the patients in this study. It is stated that hospital deaths are lower in trauma centers compared to non-trauma centers.[18] However, it has been suggested that mortality rates in FI still do not change significantly, despite all developments in trauma management and care.[12] Supporting this idea, in this study, in which FI patients were evaluated, the mortality rate was found to be compatible with the mortality rate of the trauma center.

In the evaluation of the injury sites of the patients in the study, injuries were most commonly seen in the extremities, and mortality was detected in patients with multiple injuries and head injuries. The study results of Saylam et al. supported these findings and they most commonly detected mortality in patients with multiple injuries, and they stated that the most common site of injury was the extremities.[9]

Scoring systems have been found effective in predicting mortality in many studies evaluating scoring systems in trauma patients. However, these studies have suggested the advantages of different scoring systems.[14,19,20] The scoring systems evaluated in this study were found to be very effective in predicting mortality of patients with FIs, and scoring systems were found to be correlated with each other. However, in the ROC analysis for scoring systems, the AUC (area under the ROC curve) value for TRISS was higher in both hospitalized and referred patient groups. TRISS has also been found to be more significant in mortality estimation in studies performed for different traumas.[21–23] Unlike other scoring systems, the TRISS takes into account both age and trauma mechanism. In addition, this scoring system is a mixed system in which both anatomical and physiological parameters are evaluated. In our opinion, these situations make TRISS superior to other scoring systems in the evaluation of FIs.

Jeong et al.,[8] in their study evaluating trauma patients, stated that they revised RTS and used SPO_2 instead of respiratory rate and evaluated directly with GCS score instead of coding GCS. They named the trauma score they revised as "The New Trauma Score (NTS)." Measurement of oxyhemoglobin saturation in blood with optical techniques has led to significant advances in the care of critically ill patients. Arterial oxygen saturation is considered the fifth vital sign.[24] In the light of this thought, we thought that the NTS scoring system in which SPO_2 was used could be more effective in FI patients, unlike scoring systems that generally use respiratory rate, and we investigated its effectiveness. In this study, we found that NTS, like other scoring systems, was effective in predicting mortality, but it was not superior to other scoring systems. SPO_2 measurement with pulse oximetry is an easily accessible, non-invasive, and inexpensive method. During the evaluation of FI patients, the environment is usually noisy and

the health-care team is hectic. Considering this situation, it is more practical to evaluate patients with pulse oximetry, which provides an easier and objective data, rather than respiratory rate. Therefore, we think that NTS can also be used in the evaluation of FI patients.

In the study, there was no difference in trauma scoring system scores between hospitalized and referred patients. Trauma scoring systems were not found to be sufficient in the evaluation made to determine which patients should be treated in the trauma center. Zalstein et al.[25] reported in their study on the transfer of trauma patients that the increase in ISS shortens the transfer time and that interventions during the transfer may have an effect on mortality. In our study, the evaluation times at the first admission and the transportation time to the trauma center of the patients who were referred to the trauma center were not evaluated. Furthermore, outpatients were not included in the study. These conditions may have influenced the lack of difference between the scores of hospitalized and referred patients. However, contrary to this view, in another study conducted by Arleth et al.,[26] trauma patients with a transfer time of more than 360 min and <360 min were compared, and it was observed that there was no difference between them in terms of 30-day mortality. In our study, there was no statistically significant difference in mortality between the patients who were treated in the hospital and those who were transferred, in line with the results of the study of Arleth et al.

The patients in this study were young and mostly male. In addition, the total number of patients and of patients who died in the referral group were relatively insufficient. In addition, the evaluation durations at the first admission and the transportation time to the trauma center of the referred patients were not evaluated. These created the limitations of the study. However, the lack of age and sex difference between the patient groups in the comparison of the groups and subgroup analysis was considered as the strengths of this study.

Conclusion

Commonly used trauma scores are also effective in predicting mortality in FIs. However, scoring systems were not found to be effective in distinguishing which patients should be treated in trauma centers.

REFERENCES

1. Samuel M, Galvagno JR, Massey M, Bouzat P, Vesselinov R, Levy MJ, et al. Correlatıon between the revised trauma score and injury severity score: Implıcatıons for prehospıtal trauma trıage. Prehosp Emerg Care 2019;23:263–70. [CrossRef]

2. Esme H, Solak O, Yurumez Y, Yavuz Y, Terzi Y, Sezer M, et al. The prognostic importance of trauma scoring systems for blunt thoracic trauma. Thorac Cardiovasc Surg 2007;55:190–5. [CrossRef]

3. Özkaya Ö, Canlı M, Aysal BK. Basic principles of plastic surgical approach to patients with high energy traumas. Okmeydanı Tıp Dergisi 2017;33:59–69. [CrossRef]

4. Baker SP, O'Neill B, HaddonW Jr., Long WB. The injury severity score: A method for describing patients with multiple injuries and evaluating emergency care, J Trauma 1974;14:187–96. [CrossRef]

5. Teasdale G, Jennett B. Assessment of coma and impaired consciousness. A practical scale. Lancet 1974;2:81–4. [CrossRef]

6. Champion HR, Sacco WJ, Copes WS, Gann DS, Gennarelli TA, Flanagan ME. A revision of the trauma score. J Trauma 1989;29:623–9.

7. Boyd CR, Tolson MA, Copes WS. Evaluating trauma care: The TRISS method. trauma score and the injury severity score. J Trauma 1987;27:370–8. [CrossRef]

8. Jeong JH, Park YJ, Kim DH, Kim TY, Kang C, Lee SH, et al. The new trauma score (NTS): A modification of the revised trauma score for better trauma mortality prediction. BMC Surg 2017;17:77. [CrossRef]

9. Saylam N, Uyanık B, Buz M, Büyükyılmaz T, Demir Y, Gürsoy DA, et al. Gunshot injuries due to terror. Anatol J Emerg Med 2019;2:18 23.

10. American College of Surgeons. Advanced trauma life support program for physicians: Advanced Trauma Life Support ATLS. 7th ed. Chicago, IL: American College of Surgeons; 2004.

11. Kirshenbom D, Ben-Zken Z, Albilya N, Niyibizi E, Bala M. Older age, comorbid illnesses, and injury severity affect immediate outcome in elderly trauma patients. J Emerg Trauma Shock 2017;10:146 150. [CrossRef]

12. Hink AB, Bonne S, Levy M, Kuhls DA, Allee L, Burke PA, et al. Firearm injury research and epidemiology: A review of the data, their limitations, and how trauma centers can improve firearm injury research. J Trauma Acute Care Surg 2019;87:678 89. [CrossRef]

13. Abe T, Komori A, Shiraishi A, Sugiyama T, Iriyama H, Kainoh, et al. Trauma complications and in-hospital mortality: Failure-to-rescue. Crit Care 2020;24:223. [CrossRef]

14. Turgut K, Gür A, Güven T, Oğuztürk H. Evaluation of factors related to mortality caused by firearm injury: A retrospective analysis from Malatya, Turkey. Arch Iran Med 2019;22:80–4.

15. Pleg K, Aharonson-Daniel L, Stein M, Michaelson M, Kluger Y, Simon D, et al. Gunshot and explosion injuries: Characteristics, outcomes, and implications for care of terror-related injuries in Israel. Ann Surg 2004;239:311–8. [CrossRef]

16. Eriş S, Orak M, Behçet A, Güloğlu C, Aldemir M. Factors affecting mortality in patients with gunshot injuries. Marmara Med J 2009;22:181–91.

17. Köksal Ö, Özdemir F, Bulut M, Aydın Ş, Almacıoğlu ML, Özgüç H. Comparison of trauma scoring systems for predicting mortality in firearm injuries. Ulus Travma Acil Cerrahi Derg 2009;15:559–64.

18. Karaca MA, Kartal ND, Erbil B, Öztürk E, Kunt MM, Şahin TT, et al. Evaluation of gunshot wounds in the emergency department. Ulus Travma Acil Cerrahi Derg 2015;21:248–55. [CrossRef]

19. Fedakar R, Aydıner AH, Ercan I. A comparison of "life threatening in-

jury" concept in the Turkish penal code and trauma scoring systems. Ulus Travma Acil Cerrahi Derg 2007;13:192–8.

20. Abbasi HR, Mousavi SM, Akerdi AT, Niakan MH, Bolandparvaz S, Paydar S. Pattern of traumatic injuries and injury severity score in a major trauma center in shiraz, Southern Iran. Bull Emerg Trauma 2013;1:81–5.

21. Eryılmaz M, Durusu M, Menteş Ö, Özer T, Kılıç S, Ersoy G, et al. Comparison of trauma scores for adults who fell from height as survival predictivity. Turk J Med Sci 2009;39:247–52. [CrossRef]

22. Güneytepe Üİ, Aydın ŞA, Gökgöz Ş, Özgüç H, Ocakoğlu G, Aktaş H. The factors influencing the mortality in elderly trauma patients and scor-

23. Orhon R, Eren ŞH, Karadayı Ş, Korkmaz İ, Coşkun A, Eren M, et al. Comparison of trauma scores for predicting mortality and morbidity on trauma patients. Ulus Travma Acil Cerrahi Derg 2014;20:258–64.

24. Jubran A. Pulse oximetry. Crit Care 2015;19:272. [CrossRef]

25. Zalstein S, Danne P, Taylor D, Cameron P, McLellan S, Fitzgerald M, et al. The Victorian major trauma transfer study. Injury 2010;41:102–9.

26. Arleth T, Rudolph SS, Svane C, Rasmussen LS. Time from injury to arrival at the trauma centre in patients undergoing interhospital transfer. Dan Med J 2020;67:A03200138.

ing systems. Uludag Med J 2008;34:15–9.

ORİJİNAL ÇALIŞMA - ÖZ

Ateşli silah yaralanmalarının ikinci basamak bir sağlık kuruluşunda travma skorlama sistemleri ile değerlendirilmesi

Dr. Resul Nusretoğlu,[1] Dr. Yunus Dönder,[2] Dr. İsmail Biri,[3] Dr. Yücel Gültekin[4]

[1]Hakkari Yüksekova Devlet Hastanesi, Genel Cerrahi Kliniği, Hakkari
[2]Kayseri Şehir Eğitim ve Araştırma Hastanesi, Genel Cerrahi Kliniği, Kayseri
[3]Koru Ankara Hastanesi, Genel Cerrahi Kliniği, Ankara
[4]Osmaniye Devlet Hastanesi, Yoğun Bakım Bölümü, Genel Cerrahi Kliniği, Osmaniye

AMAÇ: Travma hastalarında skorlama sistemleri yaygın olarak kullanılmaktadır ve travma hastalarının bakımında oldukça önemlidir. Bu çalışmada, travma merkezi olmayan bir hastaneye ateşli silah yaralanması nedeniyle getirilen hastaların, skorlama sistemleri ile değerlendirilmesi ve travma merkezinde tedavi olması gereken hastaların tanımlanmasında skorlama sistemlerinin etkinliğinin araştırılması amaçlandı.

GEREÇ VE YÖNTEM: Ocak 2010–Aralık 2019 tarihleri arasında ateşli silah yaralanması nedeni ile Hakkari Yüksekova Devlet Hastanesi'ne getirilen hastalar geriye dönük olarak araştırıldı. On altı yaş ve üzeri hastalar çalışmaya alındı. Hayatını kaybetmiş olarak hastaneye getirilen hastalar ve hastanede kardiyopulmoner resüsitasyona yanıt alınmayan hastalar çalışma dışı bırakıldı. Ayrıca ayaktan basit tıbbi müdahale yapılan hastalarda hasta grubuna dahil edilmedi. Hastalar, demografik olarak değerlendirildi. Travma hastalarının değerlendirilmesinde yaygın olarak kullanılan travma skorlama sistemlerinin mortalite öngörüsü incelendi. Ayrıca travma merkezlerinde tedavi olması gereken hastaların tanımlanmasında skorlama sistemlerinin etkinliği araştırıldı.

BULGULAR: Çalışmada %96.9'u erkeklerden oluşan 331 hasta değerlendirildi. Hasta grubu genç hastalardan oluştu ve yaş median değeri 27 (IQR, 24–29) yıl olarak bulundu. Yetmiş dört (%22.4) hasta tanı ve tedavi için travma konusunda referans olan hastanelere yönlendirildi. Toplam 46 (%13.9) hastada mortalite gelişti. Hastalarda Glasgow Koma Skoru, Yaralanma Ciddiyeti Skoru, Revize Travma Skoru, Yeni Travma Skoru ve Revize Travma Yaralanma Ciddiyeti Skoru mortalite öngörüsü için etkin bulundu ve skorlama sistemleri birbirleri ile korelasyon gösterdi. Ancak travma merkezinde tedavi olması gereken hastaların ayırımında skorlama sistemleri etkin bulunmadı.

TARTIŞMA: Skorlama sistemleri ateşli silah yaralanması olan hastaların mortalite tahmininde anlamlıdır. Ancak travma merkezine yönlendirilmesi gerekli hastaların ayırımında travma skorlama sistemleri etkin bulunmamıştır.

Anahtar sözcükler: Mortalite; skorlama sistemleri; travma.