Research Article

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Prehospital Factors Linked to Heart Failure-Related Arrest.

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INTRODUCTION

Despite the development of sophisticated modern trauma systems, trauma arrest upon damage is nevertheless typically irreversible and results in immediate mortality [1]. Approximately 60% of all deaths attributable to trauma are immediate deaths. +e total survival rate after traumatic arrest during the prehospital phase is as low as 3.7%, and even after performing cardiopulmonary resuscitation (CPR), prior studies found very poor outcomes [2]. Therefore, the introduction of termination of resuscitation (TOR) guidelines for situations involving an acute traumatic arrest may help to prevent the needless use of expensive resources and unnecessary medical intervention. +e 2012 The American College of Surgeons' Committee on Trauma and the National Association of Emergency Medical Service (EMS) Physicians (NAEMSP-ASCOT) released a TOR guidelines for patients experiencing traumatic cardiac arrest are discussed in a collaborative position paper [3]. These TOR guidelines, however, cannot be used consistently in other nations since they take into account both the prehospital traumatic care system and the features of traumatic arrest. Our goals are to validate the objective protocol of early TOR guidelines for traumatic arrest patients under various scenarios and to identify the clinical parameters associated with death following traumatic arrest on the scene.

METHODS

The local EMS's characteristics

Three paramedics who work for the fire department give primary care to serious trauma victims in the local emergency medical system (EMS) where this study was conducted, either on-site or during transfer. +is local EMS followed standards for severe arrests, which included doing CPR for four minutes on the spot before continuing CPR in the ambulance until ROCS while transferring the patient to the closest emergency room. Emergency medical physicians (EMPs) oversee paramedics providing invasive care online when necessary. This care includes advanced airway management, external defibrillation, and IV fluid administration. Trauma resuscitation must be given to patients experiencing traumatic arrest during the prehospital phase if they do not have injuries that are incompatible with life or obvious signs of death. This is because paramedics in Korea are not allowed to declare a patient dead, even if they are being supervised online by EMPs, due to medical laws.

Examine the design and population

This is a multicenter, retrospective observational research. This study included consecutive adult patients who had experienced traumatic arrest, were over the age of 18, were pulseless when they arrived at the scene, and had no response to apnea. The patients were transported by emergency medical services (EMS) to one of four tertiary hospital emergency rooms in the Gyeonggi province of the Republic of Korea between January 2016 and December 2018. Patients were excluded if they had a do not resuscitate (DNR) order, had been declared dead on arrival (DOA) due to confirmed life-threatening injuries or overt signs of death, such as rigor mortis or livor mortis, or had not received any resuscitation efforts in the emergency room (ER). Prehospital data, such as injury information and details on the invasive care administered (such as age, sex, injury mechanism, witness, bystander, and EMS CPR, return of spontaneous circulation (ROSC), initial arrest electrocardiogram (ECG) rhythm, transportation time factors, advanced airway, external defibrillation, and intravenous fluid), were gathered from the paramedics' first aid records. The National Emergency Department Information System (NEDIS) electronic database provided the ER survival outcome.

The statistical analysis

The Mann-Whitney test is used to compare continuous variables, which are shown as median values (interquartile range). When appropriate, the chi-square or Fisher's exact test were used to compare the nominal data, which were computed as percentages based on the frequency of occurrence. To provide criteria for early TOR regulations, multivariate logistic regression was used to find prehospital trauma-associated characteristics linked to ER death. +e The 95% confidence

interval (95% CI) is displayed with the odds ratios (ORs) that are produced. Statistical significance is defined as a two-sided p value of less than 0.05. With the IBM Statistical Package for the Social Sciences (SPSS) software version 24.0 (SPSS Inc., Chicago, IL, USA), statistical analyses were carried out.

RESULTS

EMS transported 221 adult victims of traumatic arrest from the location of the occurrence to one of four tertiary hospital emergency rooms over the course of the study. 29 of these 221 patients were deemed dead on arrival at the emergency room, thus they were not included in the study. In the end, 172 patients were included in the research.

Following acute trauma care in the emergency room, 145 (84.3%) individuals passed away there, while 27 (15.7%) survived and were given further trauma treatment. The median time from hospital admission to death in the ER fatality group was 72 (IQR 56–97) minutes. +e Baseline attributes The two groups' initial rhythms were distinct from one another. While shockable rhythm (7.4% vs. 3.4%) and PEA (51.9% vs. 34.5%) were more common in the ER survival group (p 0.038), asystole (59.3% vs. 33.3%) was more common in the ER death group. Defibrillation (14.8% vs. 3.4%) was more common in the ER survival group compared to the ER death group in terms of EMS management. In the ER survival group, prehospital ROSC (14.3% vs. 1.4%) was more common +e area under the receiver operating characteristic (ROC) curve was 0.838 (0.738–0.938) (Figure 2), which describes the sensitivity and specificity of fall height for various cutoff levels. +e 10 m threshold was shown to be the ideal height for predicting trauma death in the emergency department, with a 66.1% sensitivity and a 100% specificity.

DISCUSSION

EMS practitioners or physicians should determine the TOR of traumatic arrest in a thorough manner, taking into account ethical considerations, injury characteristics, patient condition, the local EMS system, and the overall medical environment. Even in comparable circumstances, the point at which resuscitation should end may differ depending on the doctor's judgment if there is no accepted TOR guideline.

We discovered that the bad prognosis of traumatic arrest is predicted by asystole and no prehospital ROSC despite EMS CPR. These criteria may provide as a good foundation for determining early TOR on ER. Asystole has also been shown in a number of other studies to be a poor prognostic factor; however, the mortality rate of trauma arrest with asystole is between 87 and 100% [4–7], despite the study populations in these studies differing from ours (e.g., penetrating injury to thorax, military service-related trauma).

In both penetrating and blunt trauma, asystole is indicated as a critical factor on which to decide whether to delay resuscitation, and no ROSC despite appropriate EMS treatment is advocated in the TOR protocol, according to NAEMSP-ACSCOT (3). Our research also shown that resuscitation attempts may not be successful in treating traumatic arrest brought on by a fall of more than ten meters. A person's injuries and death rate are often more severe and higher the higher the height from which they fall [8, 9]. The majority of trauma centers take +us, fall height into account while determining whether to activate the trauma team [10].

Furthermore, falls from a height of six meters, twelve meters, and eighteen meters have been linked to death rates of 22.7%, 50%, and 100%, respectively [11, 12]. However, there hasn't been much information released up to this point on the prognosis for some patient subgroups that have traumatic arrest at the scene as a result of a fall.

CONCLUSION

Asystole, no prehospital ROSC, and a fall from a higher height were linked to trauma mortality in the emergency room in a trauma arrest patient who was treated there. +e After traumatic arrest, the median transport time for ER survivors was 19 minutes, which was longer than the 15 minutes that are now thought to be irreversibly damaged. Asystole and the absence of ROSC in the prehospital phase, when employed as early TOR rules, can predict ER mortality in South Korean metropolitan regions with a specificity of 70.37% and a positive predictive value of 91.4%. When making choices regarding traumatic arrest, the TOR should consider a wide range of clinical criteria.

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