Success Rate of Pre-hospital Emergency Medical Service Personnel in Implementing Pre Hospital Trauma Life Support Guidelines on Traffic Accident Victims

Trafik Kazası Kurbanlarında Hastaneye Gelmeden Önce Travma Yaşam Desteği Uygulayan Acil Tıp Personelinin Medikal Hizmetlerdeki Başarı Oranı

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SUMMARY

Objectives

Road traffic injuries are responsible for a vast number of trauma-related deaths in middle- and low-income countries. Pre-hospital emergency medical service (PHEMS) provides care and transports the injured patients from the scene of accident to the destined hospital. The PHEMS providers and paramedics were recently trained in the Pre Hospital Trauma Life Support (PHTLS) guidelines to improve the outcome of trauma patients in developing countries. We decided to carry out a study on the success rate of PHEMS personnel in implementing PHTLS guidelines at the scene of trauma.

Methods

Severe trauma patients who had been transferred to the emergency department were included in the study. Evaluations included transfer time, airway management, spinal immobilization, external bleeding management, intravenous (IV) line access, and fluid therapy. All evaluations were performed by an expert emergency physician in the emergency department.

Results

The mean response time was 17.87±9.1 minutes. The PHEMS personnel immobilized cervical spine in 60.4% of patients, out of whom 16.7% were not properly immobilized. Out of 99 (98%) cases of established IV line access by the PHEMS providers, 57% were satisfactory. Fluid therapy, which was carried out in 99 (98%) patients by the PHEMS personnel, was appropriate in 92% of the cases.

Conclusions

PHEMS personnel need more education and supervising to provide services according to PHTLS guidelines.

Key words: Pre-hospital emergency medical service, pre hospital trauma life support, trauma.

ÖZET

Amaç

Orta ve düşük gelirli ülkelerde travmayla ilişkili ölümlerin büyük bir bölümünden karayollarındaki trafik kazalarındaki yaralanmalar sorumludur. Hastane öncesi acil tıp ekibi (PHEMS) yaralı kişilere kaza yerinden gidilecek hastaneye kadar nakleder ve bu arada onlara tıbbi bakım sunar. Son zamanlarda gelişmekte olan ülkelerde acil tıbbi bakım ve tedaviyi üstlenenlerle tıp teknisyenleri travma hastalarından alınan sonuçları iyileştirme amacıyla Hastane Öncesi Travma Yaşam Desteği (PHTLS) kılavuz ilkeleri konusunda eğitilmektedir. Yaralanma mahallinde bu personele verilen eğitimin başarı oranına ilişkin bir çalışma yapmaya karar verdik.

Gereç ve Yöntem

Çalışmaya acil servise aktarılan ağır travma hastaları alındı. Hasta nakli sırasında geçen süre, hava yolu açılması, omurganın stabilize edilmesi, dış kanama tedavisi, intravenöz (IV) giriş yolu açılması ve sıvı tedavisi değerlendirildi. Değerlendirmelerin tümü acil servisteki acil tıp uzmanı tarafından gerçekleştirildi.

Bulgular

Ortalama yanıt verme süresi 17.87±9.1 dakika idi. Acil tıp ekibi, hastaların %60.4'ünün boyun omurlarını stabilize etmiş olup bunların %16.7'si usulüne uygun biçimde gerçekleştirilmemişti. Acil tıp ekibi tarafından %57'si tatminkâr olmak üzere 99 (%98) yaralıya IV damar yolu açılmıştı. Yine 99 (%98) yaralıya verilen sıvı tedavisinin %92'si usulüne uygundu.

Sonuç

Acil tıp ekibi, hastane öncesi acil bakım ilkelerine uygun hizmet vermesi için daha fazla eğitim ve denetimden geçmelidir.

Anahtar sözcükler: *Hastane öncesi acil tıbbi hizmet, hastane öncesi travmada yaşam desteği, travma.*

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Introduction

Road traffic injuries are responsible for a vast number of trauma-related deaths in middle- and low-income countries where 90% of total mortality occurs due to such injuries.[1,2] Pre-hospital emergency medical service (PHEMS) is a vital part of the health system and emergency safety net which provides care and transports injured patients from the scene of the accident to the appropriate hospital.[3] In developing countries, the majority of road injury mortality takes place in the pre-hospital setting.[4] Improvement in the PHEMS can thus reduce the related mortality and morbidity. At the scene of accident, PHEMS providers and paramedics should quickly recognize critically-injured patients, take the necessary measures, and transport the patients to an appropriate hospital.[5]

Numerous studies have evaluated the time intervals in which PHEMS providers offer services to injured patients. The first 60 minutes after trauma has been referred to as the "golden hour" by trauma experts.[6] Previous studies suggested that increased pre-hospital time intervals are associated with increased mortality and morbidity rates in severe trauma patients.[7,8]

PHEMS providers and paramedics in low- and middle-income countries have recently been trained in the Pre Hospital Trauma Life Support (PHTLS) guidelines to improve the outcome of trauma patients. However, there is little information on the success rate of PHEMS providers in achieving the international standards.[9] A German study has lately suggested that PHEMS providers make many mistakes and unsafe actions in PHEMS scenarios.[10]

Considering the abovementioned facts, we decided to carry out a study on the success rate of PHEMS personnel in implementing PHTLS guidelines at the scene of trauma.

Materials and Methods

In a prospective cross-sectional study completed during March-September 2011, 101 severe trauma patients who had been transferred to the emergency department (ED) of Imam Reza Hospital (Tabriz, Iran) by PHEMS agencies, all nurses or paramedics, were included. Severe trauma was defined as an injury severity score (ISS) of over 15.[11,12] The study was undertaken in Tabriz, the capital city of East Azerbaijan Province, Iran with a population of 1,400,000.

Trauma management and care during transportation of the patients by PHEMS providers were evaluated against the 6th edition PHTLS. Evaluations included response time, airway management, spinal immobilization, external bleeding management, intravenous (IV) line access, and fluid therapy. All evaluations were carried out by an expert emergency physician in the ED. The data related to response time, defined as the time from alarm activation at the agency to arrival of the first responding ambulance at the scene, was obtained from the ambulance dispatch center. The data was assessed and mean response time was calculated. Airway management was defined as the implementation of maneuver, airway device, and intubation.

Due to the double-blind design of the study, the PHEMS providers were not aware of the study protocol. Likewise, the emergency physician who evaluated the PHEMS providers was not informed about their names and identification.

Ethical Consideration

Ethical approval was obtained from the Medical Ethics Committee of Tabriz University of Medical Sciences. Furthermore, due to the lack of any interventions on the patients, no written informed consents were obtained from the studied population. This research was accepted by the Deputy of Research of the Faculty of Medicine, Tabriz University of Medical Science.

Data Analysis

Data was presented as mean±standard deviation (SD) or percentage. Statistical analyses were performed in SPSS16 for Windows (SPSS Inc., Chicago, IL, USA) using chi-square, Fisher's exact, and independent samples-t tests wherever appropriate. P values less than 0.05 were considered statistically significant.

Results

Overall, 100 subjects with a mean age of 33.19±21.18 years were studied. While 43.9% of the injuries occurred in urban areas, 56.1% took place in interurban roads and semi-urban regions. The most frequent cause of trauma was motor vehicle collision (Table 1). There was a significant association between the location and type of trauma. While motor vehicle collisions were more frequent in urban areas, motor vehicle roll-overs were more common in interurban roads ($p<0.001$).

The mean response time for the arrival of PHEMS at the scene

Table 1. The frequencies of trauma causes

Trauma cause	Frequency
Car-car accident	57
Pedestrian accident	21
Motorcycle–car accident	12
Motorcycle roll over	11