Evaluation of Prehospital Care Delivered to Adult Poly-traumatized Patients in Suez Canal University Hospital

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Rec date: February 06, 2016, Acc date: April 14, 2016, Pub date: April 21, 2016

Abstract

Introduction: Advanced prehospital Trauma Life Support is the standard of care for trauma patients, and it is for rapid approach to the most immediate life-threatening conditions which should be quickly identified and addressed in the order of their risk potential.

Aim of work: evaluating the effectiveness of pre hospital assessment and management of the adult poly traumatized patients to improve the outcomes in Suez Canal university hospitals.

Patients and methods: This is a descriptive study conducted at Emergency department at Suez Canal University hospital for 12 months (from October 2014 to October 2015) to evaluate the pre hospital care delivered to poly trauma patients aiming to improve the effectiveness of pre hospital care conducted to poly trauma patients in the pre hospital phase.

Results: In this study, the mean age was 32.6+6.2 years, 53% of them between 31-40 years with male to female ratio 2:1 and the difference between rural and urban 30%. This study showed that delay in arrival is strongly related with percent of mortality, as it was 14.3% with time arrival > 2 hours. This study showed that mortality rate increased in patients with hypotension as 6.15% mortality between cases presented with systolic BP < 80 mm hg versus 1.25% mortality between patients with systolic >80 mm hg.

Conclusion: There was a relation between number of mortality and absence, ineffective or delayed pre hospital care for adult poly trauma patients.

Keywords: Prehospital care; Adult poly-trauma; Mortality; Cardiovascular collapse

Introduction

Mortality can be classified into immediate, early, and late deaths. Immediate deaths are due to a fatal injury of lungs, heart, or neurologic system [1]. Early deaths may occur from minutes to hours after injury at scene; these patients arrive to the hospital before death, which usually occurs because of hemorrhage and cardiovascular collapse [2]. Late trauma mortality due to sepsis and multiple organ failure.

Organized systems for trauma care are interested in the salvage of a patient from early trauma mortality to decrease late mortality [2,3].

Recognition of these patterns led to the development of: prehospital trauma care, prehospital care is commonly provided by well-trained persons, once trained personnel arrive, the injured person is assessed and treated at the scene and may receive one or more of first aid interventions associated with advanced prehospital trauma care, such as endotracheal intubation, intravenous fluids and needle decompression or cricothyroidotomy [4].

Importance of Field Triage

Triage is the process of classifying patients according to severity of their injuries to determine the urgency and prioritization of care needed [5].

Over-triage

Over-triage occurs when non-critical patients are taking interest and care they do not need; thus expends resources [6].

Under-triage

Under-triage occurs when critically injured patients are sent to facilities that are not properly equipped to meet their needs; this can result in increased morbidity and mortality among patients [7,8].

Aim of Work

Evaluating the effectiveness of pre hospital assessment and management of the adult poly traumatized patients to improve the outcomes in Suez Canal university hospitals.

Patients and Methods

This is a descriptive study that was conducted at Emergency department at Suez Canal University Hospital for 12 months (from October 2014 to October 2015); Inclusion criteria were poly-
Results

In this study, the mean age was 32.6±6.2 years, the difference between rural and urban 30%. Mean arrival time to hospital, it was 39.7±10.4 min. 25% of the patients had an obstructed airway, 33.3% of them only who had external bleeding all of them managed in the field, 56.7% with suspected limb fracture. Regarding the patient's outcome 44.7% of the patients were admitted to the inpatient ward and 3.33% died at the ER. Delay in arrival was strongly related to percent of mortality as it was 14.3% with time arrival > 2 hours, these results match with Singh et al, who found that 5% of the patient died at the ER after direct external compression, unlike Wisborg et al, 80% of their patients with suspected injury were put on hard board [10]. 41.7% of the patients had self-breather while 30% had assistant breathing with oxygen mask and 18.3% of the patients with three ways dressing due to chest injuries while none of them had thoracostomy or chest tube insertion. These results don’t match with Husum et al, 56.7% of their patients with assisted ventilation and received O2 [12] nor Massarutti et al. who found that 55 trauma patient underwent pre-hospital thoracostomy and it was safe and effective [14]. Our study revealed that 40% of the patients were tachycardic while 43.4% had systolic blood pressure below 80 mmhg and it showed that just 33.3% of the patients only who had external bleeding all of them managed in the field with direct external compression, unlike Wisborg et al, who found that external compression applied to 55% of the patients, 81% with gauze packing of the wounds and 10% with tourniquet. This may be due to the availability of different resources [10]. 56.7% of the patients with suspected limb fracture 16.7% of them only splinted while 46.7% of cases with suspected spine injury were put on hard board [10]. 41.7% of the patients had extremities injuries, 23.3% with head & neck injuries, 26% with chest injuries, 18.7% with back injuries and 34% combined injuries. Our results agree with Ersoy et al., extremities injuries were the same 41.7% of the patient, 25.9% of them with head & neck injuries, 20.4% with thoracic trauma and 24% with combined injuries, but the spine injuries were the most common as they caused 44.4% of all injuries [15]. Regarding the patient's outcome 44.7% of the patients were admitted to the inpatient ward and 3.33% died at the ER. These results match with Sukumaran et al. who found that 5% of the patient died at the ER except that only 19.6% of them admitted to the inpatient ward [9]. Delay in arrival was strongly related to percent of mortality as it was 14.3% with time arrival < 2 hours, these results match with Singh et al,

Table 1: Relation between usage of simple adjuncts and mortality.

| Mortality | No | Yes | Number | Percent | Number | Percent | P-value |
|-----------|----|-----|--------|---------|--------|---------|---------|
| Simple adjuncts (oral or nasal airway) | Not needed | 200 | 69% | 0 | 0.00% | <0.05* |
| Needed | Done | 64 | 22% | 2 | 3.12% | |
| Not done | 26 | 9% | 8 | 30.70% | |
| Total | 290 | 100% | 10 | |

Table 2: Relation between suspected cervical injury with collar usage and mortality.

| Mortality | Number | Percent | Number | Percent | P-value |
|-----------|--------|---------|--------|---------|---------|
| Collar | Not using collar | 31 | 39% | 7 | 22.50% | <0.05* |
| Supported by collar | 49 | 61% | 3 | 6.12% | |
who estimated that time delay between the injury and the start of definitive treatment is vital to the outcome, they found that there was a proportionate increase in mortality with increase in delay in arrival as out of 1000 patients, 383 arrived within 4 hours of trauma of whom 21 patients died as the overall mortality was 41 patients [16]. Delayed use of simple adjuncts such as oro-nasopharyngeal airways was associated with increased mortality as 30.7% of patients who had not supplied with simple adjuncts when needed died in comparison with 3.12% who had supplied with it when needed, these results agree with both Cuthbertson et al, who found that 21% of the patients died due to delay use of simple adjuncts such as oro/nasopharyngeal airways [13] and Stiell et al. who found that survival rate was 60.1% by the use of basic life support [17]. Mortality rate increased in patients with hypotension as 6.15% mortality between cases presented with systolic BP < 80 mmhg versus 1.25% mortality between patients with systolic >80 mmhg. This also agrees with both Shapiro et al. with a mortality rate of 26% in hypotensive patients compared to 4% in normotensive patients, [18] and Bilèllo et al. in which patients with hypotension in comparison to normotensive had greater mortality (24% vs. 5%, p<0.003) [19] (Graph 1).

Graph 1: Relation between delay in arrival and percent of mortality.

Conclusion

- There was a relation between number of mortality and absence, ineffective or delayed pre hospital care for adult poly trauma patients.

- Obstructed airway, unsupported cervical spine injury, hemodynamically unstable patients need appropriate and urgent pre hospital care to improve the rates of mortality in patients with poly trauma.

- Deficiency in the skills of the paramedics was a great cause in the defect or the gap between the paramedic and poly trauma patients.

Limitations of the Study

The results couldn’t be applied to other hospitals of Ismailia city due to lack of efficient registry and cooperation of the healthcare providers in other hospitals.

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