

Assessment of Awareness and Preparedness regarding Management of Major Traumatic Haemorrhage in Prehospital Settings amongst EMS Professionals, Pune, India

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Abstract

Background: In trauma cases acute major hemorrhage in the first few hours of injury is the leading cause of death in as many as 30% – 40% cases. Major hemorrhage can result in the collapse of the circulatory system and the patient can present to the emergency room in a state of shock. EMS professionals are expected to have high degree of awareness as well as should possess the requisite skills and preparedness in the various techniques utilized to control life threatening hemorrhage.

Aim: To assess the Awareness and Preparedness regarding management of major traumatic hemorrhage in prehospital settings among EMS students.

Methodology: The study was conducted amongst 141 Emergency Medical Service professionals. The original questionnaire consisted of 2 parts, first containing two clinical scenarios testing the awareness level and the second one containing twenty four items pertaining to the preparedness of EMS professionals in major traumatic hemorrhagic situations.

Result: The mean score obtained for the parameter awareness was 18.32 out of maximum score of 28. Respondents scored well on the parameter pertaining to the management of venous bleeding and amputated limb while scored relatively lower on the items pertaining to the management of capillary bleeding.

Conclusion: The present study provides encouraging results with regards on the awareness and preparedness levels of EMS professionals. It also provides insight into future training needs to enhance preparedness in cases of infrequent hemorrhagic emergencies.

Keywords: Haemorrhage, Amputated Limb, Venous, Capillary.

Background

Trauma is the sixth leading cause of death in the world. In trauma cases acute major hemorrhage in the first few hours of injury is the leading cause of death in

as many as 30% – 40 % cases.^{1,2}

A study by Sayad *et al*³ (2014) described major hemorrhage as 100% loss of blood volume within 24 hours, 50% total loss of blood volume within 4 hours or 150ml of blood loss per minute.

Major hemorrhage can result in the collapse of the circulatory system and the patient can present to the emergency room in a state of shock. Patient survival in such cases hinges on prompt control of external bleeding

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and deft management of the Airway, Breathing and Circulation in the patient⁴

Kauvar *et al*⁵(2005) in a study emphasized the significance of appropriate triage, early transportation to trauma center, efficient communication along with proper bleeding control steps for effective management of trauma cases.

The corner stone of management in such cases is the effective control of hemorrhage. This requires thorough understanding of the pathophysiology of hemorrhage and presence of mind on part of the Emergency Medical Services professionals. Success in hemorrhage control depends on effective communication between EMS professionals and consultants and strict adherence to guidelines of hemorrhage control .⁵

The role of EMS professionals is critical as most cases of trauma injury die due to major hemorrhage even before they reach the hospital .⁶

Hence EMS professionals are expected to have high degree of awareness of the pathophysiology and management of major traumatic hemorrhage as well as possess the requisite skills and preparedness in the various techniques utilized to control life threatening hemorrhage.

Aim

To assess the Awareness and Preparedness regarding management of major traumatic hemorrhage in prehospital settings amongst EMS professionals.

Methodology

The study was conducted amongst 141 Emergency Medical Service professionals at Symbiosis Center for Health Skills, Pune, India.

A pretested and validated questionnaire developed by Mofrad *et.al*⁷ was utilized for the study.

The original questionnaire consisted of two parts, first containing two clinical scenarios testing the awareness level and the second one containing twenty four items pertaining to the preparedness of EMS professionals in major traumatic hemorrhagic situations.

Within the twenty four items, four items dealt with the management of capillary bleeding, six with venous bleeding, ten with arterial bleeding and four with amputation of the limb.

Each clinical scenario consisted of Multiple Choice Questions with four correct options and four incorrect options. Each correct option marked by the respondent was given a score of one. The maximum score that could be obtained in the first section of awareness was twenty eight (Maximum score of four in each of the seven MCQs).

Preparedness was graded on a three point Likert scale ranging from Cannot do (Score 0), Can do but not perfectly (Score 1) and Can do perfectly (Score 2).The maximum score that could be obtained was eight for management of capillary bleeding, twelve for management of venous bleeding, twenty for management of arterial bleeding and eight for amputation of the limb.

Written informed consent was obtained from all the respondents before administration of the questionnaire. The questionnaire was emailed to the respondents and they were given a time of one day to revert back with the completely filled questionnaire.

The data collected was tabulated and statistically analyzed using SPSS version 23.

Result

| Percentage wise Distribution of Age | Age (%) |
|-------------------------------------|---------|
| 21 to 25 years | 60.3% |
| 26 to 30 years | 30.5% |
| 31 to 35 years | 5.7% |

Cont... Table 1. Demographic data frequency distribution table

| | |
|---|-------------------|
| 36 to 40 years | 2.1% |
| Above 40 years | 1.4% |
| Percentage wise Distribution of Sex | Sex (%) |
| Male | 67.4% |
| Female | 32.6% |
| Percentage wise Distribution of Experience | Experience (%) |
| < 1 year | 39.7% |
| 1 to 2 year | 35.5% |
| 2 to 3 year | 14.2% |
| Above 3 year | 10.6% |
| Percentage wise Distribution of Qualification | Qualification (%) |
| MBBS | 0.7% |
| BAMS | 34.8% |
| BHMS | 44.7% |
| BUMS | 16.3% |
| OTHERS | 3.5% |

Majority of the respondents belong to the age group of 21-25 years with experience of less than 2 years.

Table 2. Mean and S.D of the awareness score.

| Total Average Score Scenario 1 | Total Average Score Scenario 2 | Total Average Score Of Both The Scenarios | Standard Deviation – |
|--------------------------------|--------------------------------|---|----------------------|
| 10.56 | 7.76 | 18.32 | 2.04 |

The mean score obtained was 18.32 out of maximum score of 28.

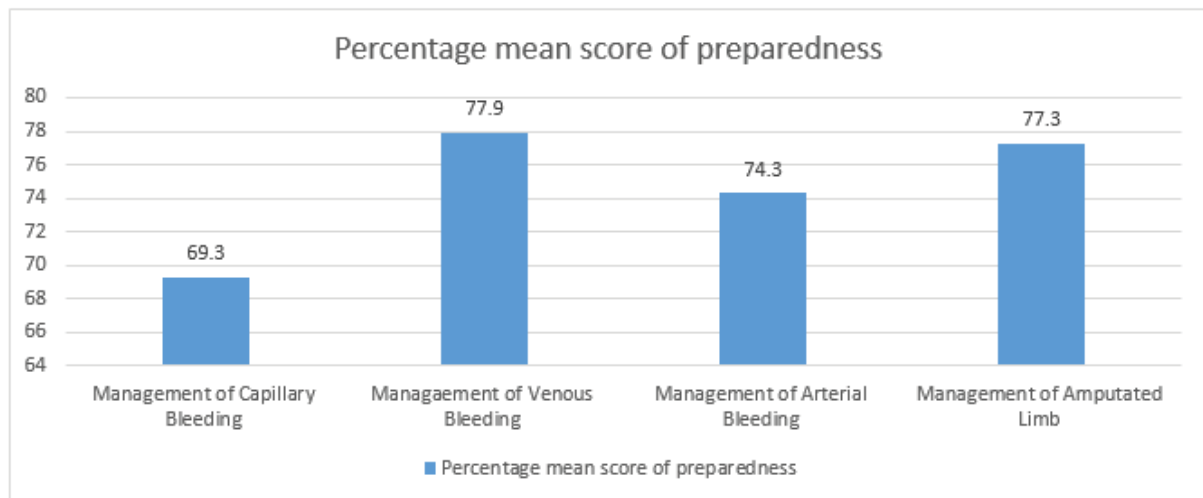


Fig 1. Percentage mean score of Preparedness

As seen in Fig 1. The respondents scored well on the parameter pertaining to the management of venous bleeding and amputated limb while scored relatively lower on the items pertaining to the management of capillary bleeding.

Discussion

The present study was aimed at assessing the level of awareness and preparedness with regards to the management of major traumatic haemorrhage amongst working EMS professionals.

Although the EMS professionals in the study has limited years of work experience they possessed above average level of awareness regarding the clinical presentation of major traumatic haemorrhage. The respondents scored better on the questions related to the symptomatology and diagnosis but scored relatively lower on the questions testing awareness of management principles.

In terms of practical preparedness the respondents scored relatively better and showed confidence in the skills related to various interventions required in a case of major traumatic haemorrhage. Within the four kinds of haemorrhage scenario the responses reflected least preparedness in the emergency management of capillary bleeding. The respondents showed greater degree of confidence and preparedness in management of venous bleeding, arterial bleeding and amputated

limb. The lower score obtained of capillary bleeding could be attributed to lack of adequate training or the relative low frequency of such emergencies in clinical practice. Nevertheless the data points towards the need of reinforcement and regular training in all kinds of traumatic haemorrhage to further boost the preparedness of EMS professionals.

Many causes of major traumatic haemorrhage are relatively rare yet life threatening as they occur seldom in clinical practice the EMS professionals failed to get adequate on-the-job-training for such emergencies. Use of clinical simulation is an effective way of training EMS professionals in rare hemorrhagic emergencies. With the utilization of high fidelity manikins and part task trainers scenarios can be created and training can be provided in safe environment.

Conclusion

Major traumatic hemorrhage is an extremely important and frequent emergency encountered by EMS professionals. The present study provides encouraging results with regards on the awareness and preparedness levels of EMS professionals. It also provides insight into future training needs to enhance preparedness in cases of infrequent hemorrhagic emergencies.

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Ethical Clearance: Obtained from IEC, SIU

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