The THAI Journal of SURGERY 2013;34:129-132.
Official Publication of the Royal College of Surgeons of Thailand

Original Article

Improving Knowledge and Skill for the Management of Trauma Patients in the Emergency Rooms of Three Southern Border Provinces of Thailand

Preecha Siritongtaworn MD*
Rattaplee Pak-Art MD**
Raywat Chunhasuwankul MD*
Narain Chotirosniramit MD***
Burapat Sangthong MD†
Nopadol Wora-Urai MD‡

**Faculty of Medicine, Siriraj Hospital, Mahidol University, Bangkok, Thailand*
***Faculty of Medicine, Chulalongkorn University, Bangkok, Thailand*
****Faculty of Medicine, Chiangmai University, Chiangmai, Thailand*
†Faculty of Medicine, Prince of Songkla University, Songkla, Thailand
‡Royal College of Surgeons of Thailand, Bangkok, Thailand

Abstract

Objective: **The three southern border provinces of Thailand are prone to frequent terrorist attacks. A large number of ensuing deaths and disabilities are reported each year. There is a standard training program (Advanced Trauma Life Support, or ATLS) to prepare emergency room (ER) doctors to take care of patients with acute injuries. The objective of this study was to improve the standard of care provided by ER physicians using the ATLS training course.**

Methods: **An ATLS training course was set in the southern part of Thailand to train ER physicians from the three southern border provinces.**

Results: **Of the 32 participants (2 courses), 17 failed their pre-training examination but only 11 failed in the post-training examination. All participants passed the practical skills examination.**

Conclusion: **This result suggested that ER doctors who are working in the three southern border provinces needed extra training to improve their management of trauma patients. The ATLS course can improve their abilities and confidence in the management of severe injuries.**

Keywords: **ATLS, trauma service, emergency room**

Introduction

Terrorism in southern Thailand is active mainly in the three border provinces, namely Narathiwat, Pattani and Yala. There are also some terrorist activities in parts of Songkhla and Satun[1,2]. Many civilians were injured or killed, or have gone missing while Thai authorities have been trying to find an effective new approach to solve problems[3]. In order to save lives, a standard treatment guideline is important for doctors when attending to injured patients in the emergency

Correspondence address: *Preecha Siritongtaworn, Department of Surgery, Faculty of Medicine, Siriraj Hospital, Mahidol University, Bangkok, Thailand. Telephone: +66 2419 7727; Email: trauma_siriraj@hotmail.com*

room. They have to conduct surgical procedures in an environment with limited access to advanced medical equipment. Some healthcare personnel may not have adequate skills in caring for trauma victims. Patients with acute life threatening traumatic injuries are thus often referred to other hospitals with more experienced doctors and proper medical equipment.

Presently, there is a standard program for training ER doctors to take care of patients with acute injuries. It is the Advanced Trauma Life Support (ATLS) program that was developed by the American College of Surgeons[4,5]. It is an internationally recognized standard training program for initial assessment and acute injury management[6,7]. The purpose of the ATLS course is to provide practical education and training to handle severe trauma and to establish a standard protocol of resuscitation. This standard training course was implemented in the three border provinces to provide doctors with effective approaches to treating severe injuries. In this study, improvement of skills was reported by the participants after the ATLS training. The effectiveness of the training was also evaluated by comparing the multiple choice questions (MCQ) test scores before and after participating in the training programs.

Materials and Methods

Two groups of ER doctors applied to participate in the ATLS program in the three border provinces of Southern Thailand. Two courses of the ATLS program were conducted during two separate periods: 17th to 19thAugust 2011 (Group 1) and 27th to 29th April 2012 (Group 2). All participants sat for the pre- and post-training MCQ tests.

The ATLS program consisted of 2 sections. The first section was on theory. In this section, skilled trauma surgeons share their experiences with the participants, which included knowledge of resuscitation, patient assessment and preliminary treatment. The instructors explained the key concepts with a presentation of photographic slides.

The second, practical section consisted of two parts. The first part was on general skills, which included airway maintenance and ventilation, management of shock, practical X-rays for thoracic and spinal injuries, head, neck and musculoskeletal trauma, and initial assessment and management. The second part was on surgical procedures, which included cricothyroidotomy, needle thoracostomy and thoracostomy tube insertion, pericardiocentesis, and diagnostic peritoneal lavage (DPL).

After completion of the practical section, participants were evaluated using the initial assessment skills station, with a cognitive and skills performance evaluation form. Using a checklist, the instructors graded and provided scores for the test simulations. To pass, participants must score 80 percent or more on the post-training MCQ paper examination, and also pass the practical skills examination on the initial assessment and management scenarios.

The effectiveness of the ATLS program was tested by comparing participants' performance scores in the theoretical section before and after training (pre-test and post-test), and percentage of participants passing the practical skills assessment.

Three months after completion of the ATLS course, participants were asked to complete a questionnaire grading the usefulness of the course. This questionnaire contained a theoretical and a practical part. The theoretical part had questions with four-grade response, and the practical part had questions with checklist tick boxes.

The test scores were reported as mean and standard deviation. The number and proportion of participants who passed the practical section in ATLS training program were also reported. The results of applying the usefulness questionnaire were given as percentages. For the before-after comparison, paired t-test was used to compare the mean scores of MCQ in the theoretical section, and the McNemar chi-square test was used to compare the number of participants who passed the test. A p-value< 0.05 was considered statistically significant.

Results

There were 16 participants in each group. All candidates sat for a pre-training MCQ test before attending the lectures. The overall mean pre-training score was 30.7 ± 4.7 points. The score of the two groups were similar (30.9 ± 3.9 for the first group and 30.5 ± 5.4 for the second group, $p > 0.05$). There was improvement of their performance after training. The mean post-training test score increased to 31.9 ± 3.0 points, which was significantly better than the mean pre-training

Table 1 Result of the response to the questionnaire on the usefulness of the ATLS course

Theoretical Part	Grade of usefulness (%)			
	Highest	High	Some	Least
Airway	100	0	0	0
Shock	100	0	0	0
Thoracic Trauma	100	0	0	0
Abdominal Trauma	91	9	0	0
Burn and Cold Injury	69	31	0	0
Head Trauma	100	0	0	0
Musculo-skeletal Trauma	94	6	0	0
Spine and Spinal cord	100	0	0	0
Trauma in women	63	37	0	0
Pediatric Trauma	88	12	0	0
Trauma in the Elderly	91	9	0	0
Stabilization and Transport	100	0	0	0

Practical Part	What have you practiced after training?	
	Yes (%)	No (%)
Chest decompression	59	41
Diagnostic peritoneal lavage	19	81
Pericardiocentesis	0	100
Cricothyroidotomy or tracheostomy	0	100
X-rays in trauma	97	3
Splinting	91	9
Triage	75	25

scores ($p < 0.05$). There was no statistically significant difference between the post-training scores of the two groups (32.1 ± 3.2 and 31.8 ± 2.8 points, respectively). A score of at least 80 percent of the total MCQ score was considered to be a pass in the training. In the pre-training test, 15 participants (46.9%) passed (7and 8 participants from the first and second group, respectively). After training, the number of participants who passed the MCQ test was 21 (65.6%; $p < 0.05$). In the practical section, all participants passed the examination which was approved by the American College of Surgeons ATLS subcommittee.

After three months, participants were asked to fill a questionnaire on the usefulness of the course. In the theoretical part, more than 90 percent of participants graded the topics of airway, shock, thoracic trauma, abdominal trauma, head trauma, musculoskeletal trauma, spine and spinal cord trauma, trauma in the elderly, and stabilization and transport, as being of highest usefulness. None graded any topic as being less than highly useful.

In the practical part, there were three areas in which most doctors had the occasion to later apply the knowledge obtained from the training (X-rays in trauma, splinting and triage). But there were other topics from the training that were not so useful (Table 1).

Discussion

The ATLS training program was conducted in the three border provinces of Thailand in order to improve the ER doctors' performance in trauma management. The ATLS training consisted of two sections. Experienced instructors lectured on standard knowledge in the theoretical section. Participants then practiced in various simulation stations.

In the present study, the post-training MCQ tests scores were higher than the pre-training scores on the average. All participants gained more skills and confidence in managing severely injured patients.

Efficient management implies that the trauma team be ready to provide resuscitative care both at the site of accident and at the emergency room.

Experienced doctors are the key to help patients with life threatening injuries. The ATLS training program will be useful in improving the doctors' knowledge and skills and enhance their confidence. In the present study, less than 50 percent of doctors passed the pre-training MCQ test, but the test results improved after training.

The scores from the practical training section were also encouraging. Most doctors accepted the advantages of training. Nonetheless, there were certain skills in the practical part which doctors did not apply after completion of the course, and these included diagnostic peritoneal lavage, pericardiocentesis, cricothyroidotomy, and tracheostomy. It might be because most doctors decided to refer some of the more severely injured patients to other hospitals.

Because most participants noted the usefulness of training for emergency management, more of these training programs should be offered to other physicians in these and other provinces. These extra courses could help more doctors in the initial assessment of severely injured patients and improve their skills in other lifesaving procedures.

Conclusion

The ATLS training course can improve the ER doctors' skills and confidence in the management of the severely injured patients.

Acknowledgement

The project research was supported by the National Research Council of Thailand (NRCT). The authors would like to thank the Faculty of Medicine, Prince of Songkhla University, for providing training facilities.

REFERENCES

1. Noor FA. Thailand's smile fades. BBC News on the web.Retrieved September 18th, 2012, available from: http: //www.news. bbc.co.uk/1/hi/world/asia-pacific/ 4017551.htm.
2. Smith AL. Trouble in Thailand's muslim south: separatism, not global terrorism. Asia-Pacific Centre for Security Studies 2004;3:340-8.
3. Engvall A. No resolution to conflict in southern Thailand.East Asia Forum News. Retrieved September 19th, 2012, available from: http://www.eastasiaforum.org/2012/01/19/no-resolution-to-conflict-in-southern-thailand.
4. Kortbeek JB, Al Turki SA, Ali J, et al. Advanced trauma life support, 8th edition. The evidence for change. J Trauma 2008;64:1638-50.
5. Carmont MR. The Advanced Trauma Life Support course: a history of its development and review of related literature. Postgrad Med J2005;81:87-91.
6. Ali J, Naraynsingh V. Potential impact of the Advanced Trauma Life Support (ATLS) program in a third world country. Int Surg 1987;72:179-84.
7. Gwinnutt CL, Driscoll PA. Advanced trauma life support. Eur J Anaesth 1995;13:95-101.