

Pediatricians and the Advanced Trauma Life Support (ATLS®): Time for Reconsideration?

Ron Ben-Abraham MD¹, Avi A. Weinbroum MD¹, Yoram Kluger MD², Michael Stein MD³, Zohar Barzilay MD FCCM² and Gideon Paret MD²

¹Department of Anesthesia and Critical Care Medicine, Tel Aviv Sourasky Medical Center, ²Pediatric Intensive Care Unit, Sheba Medical Center, Tel-Hashomer, and ³Trauma Unit, Rabin Medical Center (Beilinson Campus), Petah Tiqva [all affiliated to Sackler Faculty of Medicine, Tel Aviv University], Israel

Key words: ATLS®, trauma training, pediatric trauma, education

Abstract

Background: General pediatricians in Israel are actively involved in the initial evaluation, resuscitation and management of traumatized children. However, pediatric trauma care is not a part of pediatric specialty training in Israel, and the few Advanced Trauma Life Support® courses per year are insufficient for most pediatricians working in accident and emergency care.

Objective: To examine the value of the course in relation to the limited resources available for such training.

Methods: A telephone survey of 115 pediatricians who had taken the course between 1990 and 1994 was conducted. The responding physicians (67%) were asked to complete a specially designed questionnaire on life-saving procedures that were taught in the course. In addition, they were asked to subjectively assess the practical utility of the course.

Results: Forty-three (56%) pediatricians reported that they routinely treated both adult and pediatric trauma cases. Of these, 81% performed 27 life-saving ATLS® procedures. Pediatric trauma was treated by only 22 (28%), of whom 72.3% performed 18 life-saving ATLS® procedures. These pediatricians ranked the courses as being "very high" to "high" in impact.

Conclusions: These figures indicate that an ATLS® course designed specifically for pediatricians can markedly improve pediatric trauma care. To ensure standard education and patient care, such a course should be developed and made a mandatory component of residency training. Further studies to examine the objective impact of the courses on pediatric trauma care should be carried out.

IMAJ 2000;2:513-516

Trauma is the leading cause of childhood death and disability among children over 1 year of age [1-3]. In Israel there are

insufficient pediatric trauma surgeons, and initial pediatric trauma care is provided mainly by general pediatricians. Yet, pediatric trauma care is barely mentioned in medical school or pediatric specialty training in Israel [4]. Moreover, since the number of available Advanced Trauma Life Support® courses per year is limited in Israel, most pediatricians working in accident and emergency care have not had access to them [4,5].

The purpose of the present study was to evaluate the subjective effects of the ATLS® course on the knowledge and implementation skill of advanced life support services by practicing general pediatricians dealing with pediatric trauma victims. All pediatricians who graduated from the course were asked to judge the value of such special training, an issue that needs to be addressed in light of the limited resources available for physician training.

Methods

Study design and content

A one page questionnaire [Figure 1] was developed, incorporating demographic information and date of participation in the ATLS® course. The participants were queried by a telephone poll and asked about their trauma experience after taking the ATLS® course.

In addition to demographic questions, the participants were asked whether they had treated adult and/or pediatric trauma victims following the course, and if they had performed the life-saving procedures taught in the course. They were also asked to subjectively assess the value of the ATLS® course. Results were analyzed by the staff of the IDF Medical Corps ATLS® project. A trauma event in this survey was defined as any case – blunt or penetrating – of severe injury involving emergency ATLS® procedures. Pediatric trauma was defined as trauma occurring to children from infancy to 16 years of age.

Study population

The computerized database of ATLS® graduates of the Israel Defense Forces Medical Corps was searched to identify

ATLS = Advanced Trauma Life Support

IDF = Israel Defense Forces

Questionnaire for pediatricians who participated in ATLS® course

I. Name _____ II. Home Tel _____

III. Date of Course _____ IV. Age _____

V. Place of work _____

VI. Have you completed a residency program in pediatric intensive care or anesthesia?
Yes No

VII. Have you treated any pediatric trauma cases? Yes No Age of victim _____

VIII. If "yes", in which setting? Military _____
Civilian _____
Mass casualty event _____

IX. In your opinion, what was the impact of the ATLS® course on your theoretical knowledge?

Very high High Moderate Low No impact

In your opinion, what was the impact of the simulations and skill station exercises on your manual skills?

Very high High Moderate Low No impact

X. Did you perform any life-saving procedures that have been taught during the course?
(Tracheal intubation, chest drain insertion, needle cricothyroidotomy, intraosseous insertion, venous cutdown)

Thank you for your corporation.

Figure 1. Questionnaire for pediatricians who had participated in the ATLS® course

physicians with formal postgraduate training in pediatrics. The ATLS® program was launched in Israel by the Israel Surgical Society and has been conducted by an organized faculty of the IDF medical corps since 1990. As the study was performed in 1996 all pediatricians who had graduated the course at least 2 years earlier were surveyed.

Results

Of the 115 pediatricians (training or qualified) who participated in the ATLS® course between 1990 and 1994 as identified by the database, 38 could not be reached for

Table 1. Assessment of ATLS® course by pediatricians who had treated pediatric trauma patients (n = 22)

	Very high	High	Moderate	Low	Very low	No impact	Total
Impact on theoretical knowledge	9 (40.9%)	7 (31.8%)	3 (13.6%)	1 (4.5%)	1 (4.5%)	1 (4.5%)	22 (100%)
Effect on manual skills	6 (27.2%)	7 (31.8%)	6 (27.2%)	1 (4.5%)	0 (0%)	2 (9.3%)	22 (100%)

Table 2. ATLS® course assessment by pediatricians who treated adult trauma victims

	Very high	High	Moderate	Low	Very low	No impact	Total
Impact on theoretical knowledge	9 (42.8%)	8 (38%)	1 (4.7%)	1 (4.7%)	1 (4.7%)	1 (4.7%)	21 (100%)
Effect on manual skills	9 (42.8%)	9 (42.8%)	2 (9.6%)	1 (4.8%)	– (0%)	– (0%)	21 (100%)

technical reasons. The remaining 77 physicians – 70 males (91%) and 7 females (9%) with a mean age of 41 (range 29–50 years) – responded to the questionnaire, yielding a response rate of 67%. Sixty pediatricians (78%) worked in hospitals and all of them reported participating in pediatric emergency room activities in addition to their role in the general pediatric ward. Only three pediatricians were military physicians.

Of the 77 responders, 43 (56%) reported that they had been involved in treating adult or pediatric multiple trauma cases on various occasions, while the remaining 34 pediatricians (44%) had not. Of the 22 physicians who had treated pediatric trauma victims, 5 had done so on more than one occasion. The total number of pediatric trauma events was 27. The mean age (± standard deviation) of the treated children was 8±5 years. Twelve of these 22 physicians (54%) had completed a short rotation in the Pediatric Intensive Care Unit as part of their training. None of the pediatricians had done rotations in the anesthesia or general intensive care service during their training.

Eighteen life-saving ATLS® procedures were performed by 9 of 22 pediatricians who treated wounded children. These included seven oral intubations (39%), six chest drain insertions (33%), four intraosseous insertions (22%) and one venous cutdown (6%). None of these pediatricians performed a needle cricothyroidotomy. Of the 22 physicians who had treated pediatric trauma, 16 (72.7%) stated that the ATLS® course had greatly enhanced their cognitive knowledge, and 13 (59%) described the ATLS® course as having a high impact on the quality of their manual skills and performance [Table 1].

Twenty-one pediatricians treated adult trauma victims on 23 different occasions. Most cases were treated in the setting of the emergency room when pediatricians were serving in the Emergency Medical Service of Israel (Magen David Adom). Fifteen of these 21 pediatricians performed 27 life-saving ATLS® procedures. The procedures included 15 oral intubations (55.6%), 9 chest drain insertions (33.3%), and 3 venous cutdowns (11.1%). There was no case of adult trauma that required insertion of an intraosseous needle. Of the 21 pediatricians who had treated adult trauma, 17 (80%) stated that the ATLS® course had increased their cognitive knowledge considerably, and 18 (85%) of them felt that it had greatly enhanced the quality of their manual skills [Table 2].

Discussion

The ATLS[®] course was originally designed for physicians with limited experience in treating trauma victims. The course's objectives and its systematic approach is well accepted and practiced by both general and trauma surgeons. Although aspects of the ATLS[®] doctrine are still being debated [6,7], there is no doubt that it has had an immense influence on the way in which physicians care for traumatized patients throughout the world [8–10].

In Israel, general pediatricians are actively involved in the initial evaluation, resuscitation and management of traumatized children, in addition to surgeons from various subspecialties as indicated. A typical model was described by Singh et al. [11] in Canada, where the initial trauma team consists of a pediatric emergency resident, pediatric critical care physician, and a respiratory therapist. A published analysis of the proficiency and suitability of similar facilities in Israel no longer applies to the current situation (see below) [12]. Furthermore, the ATLS[®] course, which was officially declared as a primary requirement for surgical certification of surgeons, is not a prerequisite for general pediatric certification. Due to financial constraints, the number of pediatricians who have access to the ATLS[®] course is limited. This explains the relatively small number of pediatricians among graduates of the ATLS[®] program in Israel until 1994.

In 1990, the ATLS[®] program was launched in Israel by the Israel Surgical Society and since then has been conducted by a specially organized faculty of the Israel Defense Forces Medical Corps [5]. By 1996, almost 4,000 physicians from various subspecialties had participated in these courses in Israel. Few, however, are pediatricians. The Israeli medical milieu is a unique one. Most of the active male physicians who are in the younger age groups are recruited to active military duty (as reserve soldiers) in Israel's armed forces in cases of war. Some are assigned to units that provide medical care to the civilian population who are no longer immune to long-range missile attacks, as was witnessed during the Gulf War in 1990. With the civilian population comprising a substantial number of children, attention to pediatric trauma care capabilities within the army Medical Corps units became essential.

The vast majority of the surveyed pediatricians recognized the value and positive impact of the program. They were enthusiastic in recommending that this program be continued in order to provide advanced basic knowledge to physicians who might be called upon to treat trauma patients in their daily practice. Thus, regardless of the nature or timing of surgical involvement in the care of the trauma patient, we believe that it is essential that all pediatricians treating trauma patients be ATLS[®] trained. Our findings are in accordance with previous reports [9,10] proving that the institution of a systematic ATLS[®] program in developing countries increased the application of emergency room resuscitative procedures and improved trauma patient outcome.

Several limitations of the study must be considered. The results of our survey show a subjective improvement in cognitive and practical abilities among pediatricians who have taken the ATLS[®] course. Another limitation is the retrospective design of this study, which achieved a 67% response rate. However, within the limitations of this study, most of the surveyed pediatricians stated that the manual skills acquired during the ATLS[®] course significantly augmented their self-confidence during subsequent performance of life-saving procedures. Most of the trauma life support procedures performed by the pediatricians were intubation and tube thoracostomies, both of which are extensively practiced during the ATLS[®] courses. Pediatric residents, who are usually not exposed to basic principles of trauma care, can assimilate the required information through participation in the ATLS[®] course. In addition, this survey demonstrates the effectiveness of the ATLS[®] program as an important educational tool.

The Pediatric Advanced Life Support was recently introduced to the programs of post-graduate medical education in Israel. However, discussion of the trauma patient is limited in this course [13]. Furthermore, PALS addresses trauma care in scenarios that stress only airway management in cases of head trauma and fluid resuscitation of the trauma patient. A more complete discussion of trauma management is beyond its scope [13], and we contend that the gap can be more than adequately filled by the ATLS[®] course. Although the cost of establishing and sustaining these courses is high, the decrease in morbidity and mortality associated with treatment of trauma victims by graduates of the course validates the investment. The nationwide implementation of the ATLS[®] course in Israel, including the pediatric community, undoubtedly improved pediatric trauma care in the country.

Conclusions

Our findings indicate that the ATLS[®] course should be considered a prerequisite for pediatric board certification. To ensure standard education and patient care, an ATLS[®] course geared to the general pediatrician should be developed and made a mandatory component of residency training, or a requirement for board certification and emergency call credentials.

Acknowledgement. The authors thank the ATLS[®] instructor team for their continuous efforts.

References

1. Morton M, Eichelberger MR, Randolph JC. Pediatric trauma. *Pediatr Ann* 1994;23(4):186–91.
2. Morse TS. The child with multiple injuries. *Emerg Med Clin North Am* 1983;1:175–85.
3. Durch JS, Lohr KW. Emergency medical service for children. Washington DC: Institute of Medicine National Academy Press, 1993.

PALS = Pediatric Advanced Life Support

Original Articles

4. Shemer J. ATLS® course in the development of trauma care in Israel. *Harefuab* 1995;128:697–8 (Hebrew).
 5. Kluger Y, Rivkind A, Donchin Y, Notzer N. A novel approach to military combat trauma education. *J Trauma* 1991;31:564–9.
 6. Vestrup JA, Stormorken A, Wood V. Impact of advanced trauma life support training on early trauma management. *Am J Surg* 1988;155(5):704–7.
 7. Baker MS. Advanced trauma life support: is it adequate stand-alone training for military medicine? *Milit Med* 1994;159(9):587–90.
 8. Collicott PE, Hughes I. Training in advanced trauma life support. *JAMA* 1980;243(11):1156–9.
 9. Ali J, Adam R, Butler KA, Chang H, Howard M, Gonsalves D, Pitt-Miller P, Stedman M, Winn J, Williams JL. Trauma outcome improves following the advanced trauma life support program in a developing country. *J Trauma* 1993;34(6):890–5.
 10. Ali J, Adam R, Stedman M, Howard M, Williams JL. Advanced Trauma Life Support program increases emergency room application of trauma resuscitative procedures in a developing country. *J Trauma* 1994;36(3):391–4.
 11. Singh R, Kissoon N, Singh N, Girotti M, Lane P. Is a full team required for emergency management of pediatric trauma? *J Trauma* 1992;33(2):213–18.
 12. Thompson BM, Rice T, Jaffe J, Aprahamian C, Horwitz L, Torphy D. "PALS" for life! A required trauma-oriented pediatric advanced life support course for pediatric and emergency medicine housestaff. *Ann Emerg Med* 1984;13(11):1044–7.
 13. Seidel JJ, Hederson DP, Spencer PT. Education in pediatric basic and advanced life support. *Ann Emerg Med* 1993; 22(2):489–94.
-

Correspondence: Dr. G. Paret, Pediatric ICU, Sheba Medical Center, Tel-Hashomer 52621, Israel. Tel: (972-3) 530 2885; Fax: (972-3) 530 2562; email: gparet@post.tau.co.il