

Effectiveness of Educational Workshop of FAST and EFAST Ultrasonography on Elevation of Knowledge and Skill of Surgical Residents

Background: Ultrasound is an effective method in the evaluation of free fluid in the emergency and trauma. The aim of this study was training residents of surgery in FAST and EFAST sonography for improving their skill and knowledge in emergency of trauma.

Methods: This research was a cross sectional descriptive study. Sample volume was the residents of surgery of Hamadan university of Medical Sciences. Educational course lasted about 2 weeks and theoretical and practical program course was performed via short movies and also portable ultrasound equipment. Final exam was via DOPS method. The effectiveness of educational program with questionnaires was evaluated. After data collection statistical analysis was performed with SPSS soft ware.

Results: Most of the residents 11(61%) believed that practical education with Portable sonography was the most effective method of training. Most of the residents (70%) agreed that educational proposal was effective and valuable in traumatic triage. There wasn't a significant relationship between sex and educational level and attitude of the residents about the effectiveness of educational purpose ($P > 0.05$).

Conclusions: According to the result of the analysis of questionnaires and satisfaction of residents with this educational course, the training of residents for FAST and EFAST sonography is an important method for improving triage in trauma.

Keywords: Education; Residency, Medical; Ultrasonography; Trauma

Farideh Gharekhanlou^{1*},
Mahmoud Jabari¹
¹ Department of Radiology,
Faculty of Medicine,
Hamadan University of
Medical Sciences, Hamadan,
IRAN.

^{*}Department of Radiology
Besat Hospital
Hamadan, 65148455411,
IRAN
Tel: +98 918 817 1969
Fax: +98 811 838 0924
Email:
dr_gharekhanloof@yahoo.
com
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تأثیر اجراء دوره تعلیمیه تصویر صوتیه FAST و EFAST على مستوى العلم والمهارة عند الطلاب الجراحيه

التمهيد والهدف: إن الصورة الصوتية السريع تعتبر أسلوب التقييمي نواصيته في الاصابات، أن الهدف من هذه المطالعة هو تعليم الصورة الصوتية (FAST, EFAST) focus assessment sonography with trauma طلاب التخصص في مجال الجراحة. وهذه التدريب يتم ليده الطريق من الطلاب لرفع مستوى المهارات المعرفة اللازمة في استعمال الصورة الصوتية حين مواجهتهم لدى مرضى زو صدمات حادة.

الأسلوب: إن هذه المطالعة من النوع التوصيفي -المقطعيه لقد تمت الدراسة على جميع الطلاب التخصص في قسم جراحه في جامعة همدان في للمعلوم الطيبه. لقد تم تعليم هؤلاء الطلاب لمدة اسبوعين على السلكين العملي (بواسطة افلام وبيديوته و استخدام آلات التصوير الصوتي) والنظري. وقد تم اختبارهم بشكل عملي. لقد تم تجميع استمارات مويده من قبل مركز تعليم مداوم. بواسطة الطلاب المشتركين في هذه الدراسة. وتم تقييم وتحليل النتائج بواسطة برنامج spss الاحصائي واختبار مجذور K.

النتائج: أمد عشر الطالبيا (61%) إعتبروا أن أفضل السلوب هو التعليم العملي على المريض و سعة الطلاب (39%) إعتبروا أن الفيلم التعليمي هو الأسلوب الأفضل. إن من حيث تحقق الاهداف التعليمي إختار (70%) من الطلاب الخيار الحسن) رغم أن هذه النسبة كانت متفاوت بين الأناث و الذكور لكن لم تكن هذه النسبة ذو الصية من حيث الإحصاء. لم يكن هناك تفاوت ذو قيمة بالنسبة إلى $P > 0.05$ من حيث الإرتباط بين تحقق الاهداف التعليمي و المقطع التحصيلي لدى الطلاب.

الإستنتاج: نظرا إلى نتائج التقييم و مستوى رضا الطلاب من إجراء هذا الأسلوب التعليمي و أيضا نظرا إلى أن هذا الأسلوب موجود في البرنامج التعليمي في أكثر جامعات الدوله. لم يعطى بشكل عملي. إن إجراء هذا الأسلوب بوجب سرعت العمل في عملية الإهتمام بمرضى العوات و الصدمات.

الكلمات الرئيسية: التعليم، طلاب التخصص في طب، صدمات، الصورة الصوتية

تأثير برگزاری کارگاه سونوگرافی FAST و EFAST بردانش و مهارت دستیاران جراحی

زمینه و هدف: سونوگرافی سریع جهت ارزیابی مایع آزاد یک روش ارزیابی مهم در موارد اورژانس و تروماست. هدف از مطالعه حاضر آموزش سونوگرافی (FAST, EFAST) focus assessment sonography with trauma به دستیاران جراحی بعنوان اولین گروه مواجهه با بیماران ترومایی جهت افزایش مهارت و آگاهی ایشان در سونوگرافی اورژانس تروما میباشد.

روش: این مطالعه از نوع توصیفی - مقطعی بود که حجم نمونه آن کلیه دستیاران جراحی دانشگاه علوم پزشکی همدان بودند. کارگاه آموزش سونوگرافی به مدت دو هفته بصورت آموزش تئوری و آموزش عملی (پخش فیلمهای کوتاه و آموزش با دستگاه سونوگرافی پرتابل) برگزار گردید و امتحان عملی انجام شد. پرسشنامه مصوب مرکز آموزش مداوم توسط دستیاران تکمیل و نتایج ارزشیابی کارگاه با استفاده از نرم افزار آماری SPSS و آزمون مجذور کای آنالیز گردید.

یافته ها: اکثر دستیاران 11 نفر (61%) کار آمد ترین روش آموزش را آموزش عملی بر روی بیمار و 39% فیلم آموزشی را عنوان نموده بودند. در ارتباط با میزان تحقق اهداف آموزشی بیش از 70% دستیاران گزینه خوب را انتخاب نموده بودند هر چند این میزان بین مردان و زنان متفاوت بود لیکن از نظر آماری معنی دار نگردید. ارتباط بین تحقق اهداف آموزشی و مقطع تحصیلی دستیاران با توجه به $P > 0.05$ تفاوت آماری معنی دار نشان نداد.

نتیجه گیری: با توجه به نتایج ارزشیابی و میزان رضایتمندی دستیاران از برگزاری کارگاه آموزشی سونوگرافی همچنین نظر به اینکه در سطح اطلاعات ما در اکثر دانشگاههای کشور این آموزش علیرغم آنکه در کوریکولوم آموزشی وجود دارد بصورت عملی داده نمیشود انجام آن باعث تسریع و بهبود روند تریاژ تروما میگردد.

واژه های کلیدی: آموزش، دستیار پزشکی، تروما، سونو گرافی

سرجری ریزی ڈینٹس کی مهارت پرفاسٹ اینڈ ایمرجنسی فاسٹ سونوگرافی کی ورک شاپ کے مفید اثرات

بیگ گروانڈ: ٹروما کے صورت میں بدن کے سیال مادوں کا پتہ لگانے کے لئے ایمرجنسی میں سونوگرافی نہایت عمدہ اور موثر روش ہے۔ اس تحقیق کا مقصد سرجری کے ریزی ڈینٹس کی مهارت بڑھانے کے لئے فاسٹ اینڈ ای فاسٹ سونوگرافی کی تعلیم دینا ہے۔ جراحی کے ریزی ڈینٹس ہی وہ ڈاکٹر ہوتے ہیں جو سب سے پہلے ٹروما مریض کا معائنہ کرتے ہیں۔

روش: اس تحقیق میں ہمدان میڈیکل یونیورسٹی کے سرجری ریزی ڈینٹس نے حصہ لیا۔ سونوگرافی کی ورک شاپ دو ہفتوں تک لگی رہی اور ریزی ڈینٹس کو لکچر اور عملی طور سے ٹریننگ دی گئی۔ ورک شاپ میں سونوگرافی کی متحرک مشین استعمال کی گئی۔ ورک شاپ کے بعد ریزی ڈینٹ ڈاکٹروں کا عملی امتحان لیا گیا، میڈیکل تعلیم کے مرکز سے منظور شدہ سوالنامے بھی ڈاکٹروں کو دئے جاتے رہے اور ورک شاپ کے نتائج کا تجزیہ ایس پی ایس سافٹ ویئر سے کیا گیا۔

نتیجہ: اس تحقیق میں شرکت کرنے والے ریزی ڈینٹ ڈاکٹروں کی اکثریت نے سونوگرافی کی متحرک مشین سے ٹروما کے بیمار پر عملی وضاحت کو سب سے موثر اور کارآمد طریقہ قرار دیا جبکہ اثنالیس فیصد ڈاکٹروں نے تعلیمی ویڈیو کو موثر قرار دیا۔ جنسیت کے لحاظ سے اس ورک شاپ کے نتائج پر کوئی اثر نہیں پڑا۔ بلکہ اکثر ڈاکٹروں نے اس روش کو بہتر قرار دیا ہے تقریباً ستر فیصد ریزی ڈینٹ اس ورک شاپ سے مطمئن تھے۔

سفارشات: سونوگرافی ورک شاپ سے ریزی ڈینٹ ڈاکٹروں کے اطمینان اور رضایت کو دیکھتے ہوئے نیز اس امر کے پیش نظر کہ اکثر یونیورسٹیوں میں سونوگرافی کا موضوع نصاب میں شامل ہونے کے باوجود بھی اسے نہیں پڑھا جاتا اور نہ اس کی عملی تعلیم دی جاتی ہے یہ ضروری ہے کہ سونوگرافی کی عملی تعلیم کا اہتمام کیا جائے تاکہ ٹروما مریضوں کی بہتر دیکھ بھال کی جاسکے۔

کلیدی الفاظ: ٹروما، ریزی ڈینٹ، تعلیم، طب۔ ایمرجنسی

INTRODUCTION

Today, trauma is one of the leading causes of mortality and this is more than obvious that rapid management of traumatic patients is very crucial. In the United states it is measured that thirty percent of these mortalities are preventable (1). The researches focusing on evaluating these patients within the shorter time, so called as "the Golden Hour" phrase, is used to describe the importance of this issue and each minute of delay dramatically affects the final outcome.

Since 1980s ultrasonography has been considered as an important notion in the evaluation of the traumatic patients and this approach called focus assessment with sonography in trauma (FAST) or Bed side sonography. Currently the usability of FAST is widely accepted and recommended (2) and more focus is put on free liquid evaluation (**Hemoperitoneum**) in case of trauma. Within the next years this notion will be extended from **Hemoperitoneum to Pneumoperitoneum and Pericardial effusion** will be confirmed and Extended FAST (E-FAST) supported (3). Currently ultrasonography is a part of physical examination in traumatic patients and enables the trauma team to diagnose life-threatening bleeding. The advantages of it include: easiness, availability, portability, accuracy and repeatability, and despite diagnostic peritoneal lavage (DPL) it is non-invasive and does not require contrast solution, and does not expose the patient to radiation (2). The FAST technique might be the only method to save the life of the patient and it is possible in unstable patients as well. In many trauma centers, the surgery assistants are the first liners who encounter to traumatic patients. Based on documentations of Secretary of Commission of Medical Education of Ministry of Health of Iran, it is essential to teach FAST to surgery residents (4). But in our evaluation many tertiary hospitals does not follow it. So we decided to train this to the target group by theoretical practical workshops about FAST (bed side) to reach educational objectives, improve the quality of care and skill of residents of surgery. Then we evaluated their satisfaction about these training programs, in case of increment of knowledge and skills.

METHODS

This cross-sectional descriptive study was conducted with

the participation of all residents of surgery of Hamadan University of Medical Sciences in 2010. At first, the workshop was held for the target group. The syllabus was instructed in theoretical and practical parts. The theoretical part included principals of ultrasonography application within traumatic patients, sonographic features of free fluid within abdomen, and the practical part, portable ultrasonography device (General Electric model Alfa-RT), applications of FAST and E-FAST on some traumatic patients and presentation of eight educational movie clips about FAST technique.

Assessment of the residents after the training course was done within the intensive care unit with a portable sonography device by Direct Observation of Procedural Skill (DOPS) method. For evaluation of the workshop efficacy university standard questionnaire for evaluation of continuous medical education programs was offered to participants. The data of the questionnaires was analyzed with SPSS version 13.0, for the evaluation of the relationship between gender and satisfaction rate, and the relation between year of the study and for obtaining educational objectives, Chi-Square test was used.

RESULTS

The participated residents included 14 males and 4 females. Six, five, four, and three were at the first, second, third, and fourth year of study respectively. All participants filled the questionnaires (response rate was 100%). In case of the most effective method of training, the majority of the participants (11 persons, 61.1%) called practical phase, the most appropriate one while the rest preferred the movie clips part.

Table 1 shows the relation between obtaining educational objectives and resident satisfaction, and as is showed, most of the participants, with high ranking the educational objectives based on focused targets, high potential of multimedia learning, appropriate lectures, quality of movie clips, and selection of applicable content based on needs, demonstrated their satisfaction from these programs. Table 2 shows satisfaction rate of residents in case of year of study.

In case of the relation between the obtained educational objectives and gender, the observed difference was not significant ($P > 0.05$).

Table 1. Frequencies of of satisfaction rates about educational objectives among residents (n=18)

	Appropriate N (%)	Approximately Appropriate N (%)	Not Appropriate N (%)
Educational objectives based on focused targets	13 (72.2)	5 (27.8)	0 (0.0)
High potential of multimedia learning	15 (83.3)	3 (16.7)	0 (0.0)
Appropriate lectures	12 (66.6)	6 (33.3)	0 (0.0)
Quality of movie clips	15 (83.3)	3 (16.7)	0 (0.0)
Selection of applicable content based on needs	13 (72.2)	5 (27.8)	0 (0.0)

Table 2. Frequencies of Satisfaction rates of residents in case of year of study					
	First year N (%)	Second year N (%)	Third year N (%)	Fourth year N (%)	P-Value
Educational objectives based on focused targets	4 (66.7)	4 (80.0)	3 (75.0)	1 (66.7)	0.95
High potential of multimedia learning	2 (33.3)	3 (60.0)	4 (100.0)	3 (100.0)	0.86
Appropriate lectures	5 (83.3)	4 (80.0)	3 (70.0)	3 (100.0)	0.84
Quality of movie clips	3 (50.0)	3 (60.0)	4 (100.0)	3 (100.0)	0.45
Selection of applicable content based on needs	4 (66.7)	4 (80.0)	3 (75.0)	3 (100.0)	0.72

DISCUSSION

In recent years trauma has been one of the leading causes of mortality and hospitalization in intensive care units. It is known that management of trauma patients need team working and an integrated team approach is recommended (1). In recent years the role of ultrasonography in first line diagnostic tool is confirming in trauma centers, worldwide. The benefits of this diagnostic method is proved in several studies.

In comparison to DPL or laparotomy, as gold standard and ultrasonography sensitivity and specificity of these three methods are 87.2%(81-100%), 97.6%(93-100%) and 96.9%(94-100) respectively. While the last is portable and despite DPL is non-invasive and side effect free (1). Besides, in case of chest trauma, in comparison with CT scan and lying chest X-ray , as gold standard methods, bed side ultrasonography (49-100%) is more sensitive than the other ones (27-75%) with the same specificity (99-100%), and the former is practical in less than few minutes (5). On the other hand, ultrasonography of E-FAST provides a better estimation the size of pneumothorax, as well (6,7) in ventilated patients, the positive pressure of ventilation, evaluation of the condition with ultrasonography prohibit development of tension pneumothorax prior to CT-scan (8). As a conclusion FAST is less invasive than DPL and does not require radiation or contrast in comparison to CT-scan, while it is less expensive and even as accurate as that (9). In the evaluation of the traumatic patients, FAST algorithm is known as it is illustrated in figure1 (10).

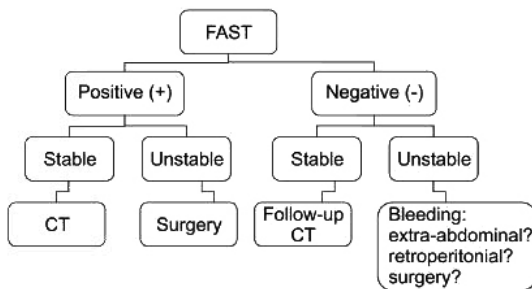


Figure 1: FAST Consensus

Currently E fast is introduced as an accomplishment of physical examination and reduces patient evaluation time. In one study on 10107 patients, the importance of time in the reduction of hospital stay and mortality rate is confirmed. In this study, it is suggested that trauma and injury evaluation and therapeutic planning less than four hours, reduced the mortality rate significantly (11). In another study triage and time efficacy in the reduction of mortality rate is assessed (12).

The role of logistics and trained personnel in trauma center is very important. In a study in 2010 it is suggested that delivery of the patients to not-well equipped centers with inexperienced personnel, increased the mortality rate more than 3.8 folds (13). It should be insisted that ultrasonography is an important skill and mostly operator dependent.

In annual meetings of Surgery Association of Iran, in pre-conference schedules some workshops were held for this purpose (14). In Tehran University, FAST educational workshops were held for the third year surgery residents in Clinical Skill Center of the university. But are these training courses appropriate and enough to achieve appropriate standard of care in case of rapid increment of traumatic events in recent years across the country?

Physicians of American College of Emergency Care, after several studies, reported that performing 25-50 times of practice is needed to reach optimum skill of FAST ultrasonography (15). In other studies it is reported that at least ten trials of FAST ultrasonography are essential for getting the appropriate skill (16,17,18). Australian College of Emergency Care recommends that at least four hours of workshop with clinical assessment is needed (19). In the current study we trained the participants within a three hour workshop and final evaluation in intensive care unit with DOPS method in some traumatic patients. In the evaluation of the relation between the year of study and educational objectives, there was not a significant difference, although it seems learning from movie clips is increasing among senior residents.

Overall, based on the findings of the current study and verbal debates in workshops, the satisfaction rate of residents was high. But commitment and attendance of residents in radiology department for continuum of training

for increment of skill in FAST ultrasonography is essential. We should remember that this method is not as sensitive as CT-scan particularly in solid masses and in obese patients, less experienced operators might report false negative in one trial. So it is recommended to repeat this assessment in follow up or whenever the patient condition is worsening. In the last educational session of residents, it was insisted on adding this training course to the curriculum of surgery residents. But to our knowledge this is not applicable, nationwide. In Besat hospital of Hamadan, one of the largest subspecialty trauma centers in western country, after these training courses, one portable ultrasonography devices provided to emergency ward of the hospital.

We should believe that knowledge transfer between various academic departments, will lead to professional development and improvement of expected competencies and procedural skills, and it is beneficial for the patients, at most. So we should collaborate to have honest and peaceful commitment for better service delivery to our customers in hospitals. So we hope this experience be extended to other universities and the training courses be routinely provided.

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