

Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.JournalofSurgicalResearch.com

Association for Academic Surgery

Viscoelastic monitoring in pediatric trauma: a survey of pediatric trauma society members



Robert T. Russell, MD, MPH,^{a,*} Ilan I. Maizlin, MD,^a
and Adam M. Vogel, MD^b

^aDivision of Pediatric Surgery, Department of Surgery, Children's of Alabama, University of Alabama at Birmingham, Birmingham, Alabama

^bDivision of Pediatric Surgery, Department of Surgery, Texas Children's Hospital, Houston, Texas

ARTICLE INFO

Article history:

Received 8 February 2017

Received in revised form
8 March 2017

Accepted 23 March 2017

Available online 31 March 2017

Keywords:

Pediatric

Trauma

Coagulopathy

Viscoelastic testing

ABSTRACT

Background: Viscoelastic monitoring (VEM), including thromboelastography (TEG) and rotational thromboelastometry (ROTEM) in the setting of goal-directed hemostatic resuscitation has been shown to improve outcomes in adult trauma. The American College of Surgeons (ACS) Committee on Trauma recommends that “thromboelastography should be available at level I and level II trauma centers”. The purpose of this study is to determine the current availability and utilization of VEM in pediatric trauma.

Methods: After IRB and Pediatric Trauma Society (PTS) approval, a survey was administered to the current members of the PTS via Survey Monkey. The survey collected demographic information, hospital and trauma program type, volume of trauma admissions, and use and/or availability of VEM for pediatric trauma patients.

Results: We received 107 responses representing 77 unique hospitals. Survey respondents were: 61% physicians, 29% nurses, 6% trauma program managers, and 4% nurse practitioners/physician assistants. Over half of providers worked in a free standing children's hospital. Seventy-seven percent of respondents were from hospitals that had >200 trauma admissions/year, 42% were providers at ACS level 1 pediatric trauma centers, and 62% practiced at state level 1 designated centers. VEM was available to 63% of providers, but only 31% employed VEM in pediatric trauma patients. For those who had no VEM available, over 73% would utilize this technology if it was available. Seventy-one percent of providers continue to rely on conventional coagulation assays to monitor coagulopathy in pediatric trauma patients after admission.

Conclusions: While a growing body of evidence demonstrates the benefit of viscoelastic hemostatic assays in management of adult traumatic injuries, VEM during active resuscitation is infrequently used by pediatric trauma providers, even when the technology is readily available. This represents a timely and unique opportunity for quality improvement in pediatric trauma.

© 2017 Elsevier Inc. All rights reserved.

This paper was presented on February 7th, 2017 at the Academic Surgical Congress in Las Vegas, Nevada by Robert T. Russell.

* Corresponding author. Division of Pediatric Surgery, Department of Surgery, Children's of Alabama, University of Alabama at Birmingham, 1600 7th Avenue South, Lowder Building Suite 300, Birmingham, AL 35233 Tel.: +1 205 638 9688; fax: +1 205 975 4972.

E-mail address: robert.russell@childrensal.org (R.T. Russell).

0022-4804/\$ – see front matter © 2017 Elsevier Inc. All rights reserved.

<http://dx.doi.org/10.1016/j.jss.2017.03.016>

Introduction

Trauma is the leading cause of death in the pediatric population.¹ Hemorrhage remains one of the leading causes of preventable traumatic death for all patients, accounting for 20%-40% of all early trauma mortality.^{2,3} There has been a significant focus in incorporating viscoelastic monitoring (VEM) into adult resuscitation strategies. VEM, including thromboelastography (TEG) or thromboelastometry (ROTEM), has emerged as point-of-care tools that can guide hemostatic resuscitation of bleeding injured patients.⁴ These assays can be continued to be utilized in a point-of-care mode throughout the patients' course whether it be in the operating room or in the intensive care unit. These methods utilize a whole blood sample to measure the global properties of clot formation under low shear stress. One advantage of this method is that it evaluates the interaction of platelets with the coagulation cascade.⁵ In addition, VEM has been shown to be more accurate and more timely for the assessment of traumatic coagulopathy and fibrinolysis compared to conventional coagulation assays (CCAs).⁶⁻⁹ Both tests are potentially useful in rapidly diagnosing coagulopathy, guiding transfusion; however, due to differences in specific activators for each test, there are limited direct comparative studies. Recently, a randomized clinical trial demonstrated that a TEG-guided resuscitation in trauma patients, compared with a CCA-guided resuscitation, resulted in a significant decrease in mortality and led to a lower utilization of plasma and platelets.¹⁰ Furthermore, the American College of Surgeons (ACS) Committee on Trauma recommends that "thromboelastography should be available at Level I and Level II trauma centers."¹¹ The objective of this study is to determine the current availability and utilization of VEM in resuscitation and monitoring of pediatric trauma patients.

Methods

Survey

Following approval by the Institutional Review Board and by the executive committee of the Pediatric Trauma Society (PTS), a deidentified web-based survey was formulated, in accordance with the guidelines of the Checklist for Reporting Results of Internet E-Surveys (CHERRIES).¹² The survey was generated via a subscription-based online survey software and questionnaire tool (SurveyMonkey, Palo Alto, CA). The 19-question survey collected information regarding trauma program type, hospital type, volume of trauma admissions, availability of VEM at the hospital, and use of VEM for pediatric trauma patients. All sections were composed of multiple choice supplemented with free-text open response options. All questions contained a nonresponse option. Piloting of the survey indicated that completion required approximately 10 min.

Participants and distribution

The survey was exclusively distributed to current members of the PTS. The PTS is a multidisciplinary professional

organization, whose mission includes improving outcomes for injured children through development of optimal care guidelines, education, research, and advocacy. The survey was distributed over the period of 2 mo from March 1, 2015 to May 1, 2015, with bi-weekly reminders of the survey to the members.

Statistical analysis

Survey responses were automatically captured by the online software and exported as a coded summary file. Non-responses were omitted from analysis. Consequent multiple choice responses were treated as categorical data and presented as counts with percentages and analyzed using the Fisher exact test. Statistical significance was determined at $P \leq 0.05$. All analysis was performed using IBM SPSS Statistics for Windows, version 23 (IBM Corp, Armonk, NY) and SAS 9.4 (Statistical Analytics Software Institute, Cary, NC).

Results

We received 107 survey responses representing 77 unique hospitals. This response represented 14.7% of the overall membership of the PTS (730 members). The breakdown of survey respondents is displayed in Table 1, with the characteristics of the institutions they represent noted in Table 2.

Table 1 – Demographics of respondents.

Practitioner characteristics	n	%
Profession		
Physician	66	61.7
Nurse	31	29.0
Physician assistant	6	5.6
Trauma program manager	3	2.8
Nurse practitioner	1	0.9
Primary practice environment		
Emergency medicine	12	11.2
General surgery	6	5.6
Pediatric surgery	61	57.0
Intensive care	5	4.7
Anesthesia	2	1.9
Trauma	21	19.6
Time in practice		
<5 y	19	17.8
5-10 y	17	15.9
10-15 y	16	14.9
15-20 y	23	21.5
>20 y	32	29.9
Primary patient age group		
Adult (≥ 15 y)	2	1.9
Children (<15 y)	85	79.4
Both	20	18.7

Download English Version:

<https://daneshyari.com/en/article/5733794>

Download Persian Version:

<https://daneshyari.com/article/5733794>

[Daneshyari.com](https://daneshyari.com)