Obstetric training in Emergency Medicine: a needs assessment

Adam James Janicki1*, Courteney MacKuen1, Alisse Hauspurg2 and Jamieson Cohn1

1Department of Emergency Medicine, Alpert Medical School of Brown University, Providence, RI, USA; 2Department of Obstetrics and Gynecology, Alpert Medical School of Brown University, Women & Infants Hospital, Providence, RI, USA

Background: Identification and management of obstetric emergencies is essential in emergency medicine (EM), but exposure to pregnant patients during EM residency training is frequently limited. To date, there is little data describing effective ways to teach residents this material. Current guidelines require completion of 2 weeks of obstetrics or 10 vaginal deliveries, but it is unclear whether this instills competency.

Methods: We created a 15-item survey evaluating resident confidence and knowledge related to obstetric emergencies. To assess confidence, we asked residents about their exposure and comfort level regarding obstetric emergencies and eight common presentations and procedures. We assessed knowledge via multiple-choice questions addressing common obstetric presentations, pelvic ultrasound image, and cardiotocography interpretation. The survey was distributed to residency programs utilizing the Council of Emergency Medicine Residency Directors (CORD) listserv.

Results: The survey was completed by 212 residents, representing 55 of 204 (27%) programs belonging to CORD and 11.2% of 1,896 eligible residents. Fifty-six percent felt they had adequate exposure to obstetric emergencies. The overall comfort level was 2.99 (1–5 scale) and comfort levels of specific presentations and procedures ranged from 2.58 to 3.97; all increased moderately with postgraduate year (PGY) level. Mean overall percentage of items answered correctly on the multiple-choice questions was 58% with no statistical difference by PGY level. Performance on individual questions did not differ by PGY level.

Conclusions: The identification and management of obstetric emergencies is the cornerstone of EM. We found preliminary evidence of a concerning lack of resident comfort regarding obstetric conditions and knowledge deficits on core obstetrics topics. EM residents may benefit from educational interventions to increase exposure to these topics.

Keywords: Emergency Medicine; obstetrics; graduate medical education; curriculum development

*Correspondence to: Adam James Janicki, Department of Emergency Medicine, Alpert Medical School of Brown University, 55 Claverick Street, Suite 100, Providence, RI 02903, USA, Email: adam_janicki@brown.edu

Received: 23 June 2015; Revised: 23 May 2016; Accepted: 23 May 2016; Published: 28 June 2016
chance and the lack of sustained exposure may be a
detriment to resident comfort with obstetric emergencies.

Curriculum development in medical education begins
with the identification of a problem with a general and then
targeted needs assessment (5). In order to identify a
curriculum for obstetric training in EM that would ensure
clinical competency required for emergency practice, we
performed a needs assessment to establish residents’
attitudes, beliefs, and knowledge of basic obstetric emer-
gency topics. The study was conceptualized as a preli-
nary investigation to inform hypotheses for further
research regarding the potential need for and effect of
educational interventions.

Methods

We created a 15-item survey designed to elicit resident
attitudes and knowledge related to obstetric emergencies.
Attitudes and beliefs were addressed with questions
regarding residents’ exposure to obstetric emergencies
and their comfort regarding eight common presentations and
skills: first, second, and third trimester bleeding,
decreased fetal movement, labor, cervical checks, pelvic
ultrasound, and lower abdominal pain in pregnancy –
conditions deemed either ‘critical’ or ‘emergent’ by the
2013 EM Model Curriculum (6). Overall comfort level was
determined by a composite score of all subjective items.
Knowledge of obstetric emergencies and procedures was
assessed through five multiple-choice questions regarding
the management of preterm labor, second-trimester bleed-
ing, normal vaginal delivery, and the interpretation of
pelvic ultrasound and cardiotocography images. All sub-
jective items were answered with a 5-point scale with
anchors of 1-‘not comfortable’, 3-‘somewhat comfortable’,
and 5-‘completely comfortable’. All multiple-choice ques-
tions had five answer choices; residents were asked to select
the most correct choice.

Multiple-choice questions were adapted from standar-
dized study questions for the National Board of Medical
Examiners Ob/Gyn medical student shelf examination; these
are designed to target third-year medical students.
Questions were piloted among EM and Ob/Gyn faculty
and residents to ascertain face validity and were revised
based on feedback. Difficulty indexes were calculated for
each multiple-choice question.

The survey was administered online via SurveyMonkey
in September 2014, with the link distributed to program
directors across the United States utilizing the Council of
Emergency Medicine Residency Directors (CORD) list-
serv. Program directors were asked to distribute the study
invitation and survey link to their residents via email.
There were no incentives for participation.

Given the presence of both 3- and 4-year residency
programs, postgraduate year (PGY) 3 and 4 results were
combined in analysis, similar to the reporting of the
American Board of Emergency Medicine In-Service
Examination scores. Subjective item scores, composite
scores of all subjective items, and mean composite scores
on the multiple-choice questions were calculated and
scores for each PGY level were compared using one-way
ANOVA tests. Individual multiple-choice question scores
were also calculated, stratified by PGY level and com-
pared using chi-square tests. All means are reported with
standard deviations (SD). A p-value less than 0.05 was
considered statistically significant.

All study procedures were approved by the Rhode
Island Hospital institutional review board.

Results

The survey was completed by 212 residents from 28
different states, representing 55 of 204 (27%) accredited
ED residency training programs belonging to CORD,
and 11.2% of the 1,896 eligible residents. Participating
residents stratified by PGY level and geographical region
are presented in Table 1.

Fifty-six percent of residents felt that they had adequate
exposure to obstetric emergencies. The composite score
for comfort level of managing obstetric emergencies for
all respondents was low, 2.99 (SD 0.70), increasing
modestly with advancing PGY level (PGY1 = 2.54, SD
0.66, PGY2 = 2.99, SD 0.60, PGY3/4 = 3.24, SD 0.69;
p < 0.001). The comfort levels of the eight specific pre-
sentations and procedures ranged from 2.58 (SD 1.04) to
3.97 (SD 0.94) and generally increased with PGY level
(Table 2).

Mean percent correct across all multiple-choice ques-
tions was 58.0% (SD 20.9%) with no statistical difference
by PGY level (PGY1 = 56.2%, SD 21.1%; PGY2 = 59.7%,
SD 22.0%; PGY3/4 = 57.5%, SD 20.0%; p =
0.622). Difficulty indexes for each question by topic
included: preterm labor 0.49, cardiotocography 0.41,

Table 1. Respondent characteristics

| Location | No. of respondents (%) |
|----------|------------------------|
| Northeast | 87 (41) |
| South | 61 (28.8) |
| Midwest | 38 (17.9) |
| West | 25 (11.8) |

aNortheast: Maine, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania.
bSouth: Delaware, West Virginia, North Carolina, Kentucky, Tennessee, Georgia, Florida, Mississippi, Arkansas, Louisiana, Texas.
cMidwest: Ohio, Illinois, Michigan, Minnesota, Missouri.
dWest: Colorado, Arizona, Utah, California, Washington.
Identification and management of obstetric emergencies is essential in EM. In fact, the Emergency Medical Treatment and Labor Act, which requires all patients presenting at ED be evaluated and stabilized, specifically mandates that all pregnant patients in presumed labor be evaluated by a physician (7). Obstetric emergencies characteristically occur infrequently, making it difficult to establish and maintain competency. Further, obstetric emergencies are often coupled with high risks; therefore, it is imperative that emergency physicians are competent in caring for these patients. To date, no needs assessment has been performed regarding obstetric training in EM to inform the improvement of this component of residency education.

Currently, ACGME requirements are relatively limited and quite broad (4). Given that only about half of the residents felt that they had enough experience with these patients, the limited time currently required by the ACGME may not allow for adequate exposure to obstetric emergencies. Of note, in our sample, even residents at the end of their training did not feel ‘somewhat comfortable’ (response less than three) managing over 50% of the surveyed topics.

Although half of the residents surveyed felt they had adequate obstetric training, overall knowledge scores were low. Thus, EM residents may be unaware of their educational deficits; therefore, it was important to evaluate resident knowledge regarding managing these patients. The average composite score on the multiple-choice questions was only 58%, suggesting that current requirements may be insufficient in training knowledgeable resident physicians. Even more concerning is that variation in testing performance was not attributable to training level – all residents in our sample demonstrated educational deficits on core obstetric topics.

The ACGME requirement of completion of 10 vaginal deliveries for all EM residents potentially homogenizes EM education regarding this subject matter. Based on our testing, this standardization is associated with improved competency, given the difficulty index of 0.90 for the question asking to identify the correct steps of a normal vaginal delivery. The lower difficulty indexes on the remaining multiple-choice questions suggest that consideration should be given to the potential benefit of additional ACGME requirements and standardization of obstetric training in EM.

Our survey findings support the fact that EM residency training may benefit from educational interventions to increase exposure to obstetric patients. At our institution, based on feedback regarding our Ob/Gyn experience, a Longitudinal Ob/Gyn Clinical Experience has been instituted giving second through fourth year residents additional obstetrics experience. Literature has demonstrated that students are generally more satisfied and may learn and retain both knowledge and clinical skills better when trained in a longitudinal curriculum (8, 9). Further, satisfaction surveys have demonstrated that learners prefer this method of training to traditional programs with discrete experiences (8–10).

Other possible interventions to improve resident attitude and knowledge include increasing the time spent on the dedicated Ob/Gyn rotation during the intern year or revisiting the Ob/Gyn experience again during PGYs 3 or 4. Many residency programs are limited by available time for additional clinical responsibilities. In these instances, implementation of structured didactics, web-based learning tools, or simulation-based curricula specifically designed to target resident exposure to obstetric emergencies may ensure a more comprehensive educational experience.

Table 2. Subjective measurements

| Presentation/procedure                        | All residents | PGY 1    | PGY 2    | PGY 3/4  | p      |
|-----------------------------------------------|---------------|----------|----------|----------|--------|
| Composite score                               | 2.99          | 2.54     | 2.99     | 3.24     | <0.001*|
| 1st Trimester bleeding                        | 3.97          | 3.27     | 3.94     | 4.37     | <0.001*|
| 2nd Trimester bleeding                        | 3.2           | 2.57     | 3.21     | 3.53     | <0.001*|
| 3rd Trimester bleeding                        | 2.72          | 2.36     | 2.69     | 2.93     | 0.01*  |
| Decreased fetal movement                     | 2.6           | 2.3      | 2.56     | 2.8      | 0.01*  |
| Labor                                        | 2.95          | 2.68     | 3.12     | 2.95     | 0.054  |
| Cervical checks                              | 2.58          | 2.26     | 2.46     | 2.87     | 0.002* |
| Pelvic ultrasound                            | 2.65          | 2.26     | 2.64     | 2.86     | 0.02*  |
| Lower abdominal/pelvic pain in pregnancy     | 3.26          | 2.62     | 3.28     | 3.6      | <0.001*|

*Values are statistically significant (p < 0.05).
Limitations
Our study has several limitations. Although adapted from an established study tool and piloted for face validity, our survey did not undergo further validity and reliability testing. The low response rate creates the possibility of participation bias and restricts the generalizability of our findings. However, our study sample did include diversity in terms of PGY levels, regional distribution, and representation from a broad range of US residency programs.

Conclusions
The identification and management of obstetric emergencies is the cornerstone of EM training. In this exploratory needs assessment of EM residency programs, we found preliminary evidence of a concerning lack of resident comfort regarding obstetric conditions and profound knowledge deficits on core obstetrics topics. These findings should be further investigated in a larger sample of EM residents. Such work may ultimately support the need for a standardized curriculum or other educational interventions that increase exposure to these clinical topics.

Authors’ contributions
AJ and JC conceived the study and analyzed the data, AJ and AH designed the survey, and AJ and CM were responsible for the statistical analysis. AJ was the lead manuscript author and CM, AH, and JC were all involved in subsequent critical revisions. All authors have read and approved the final, submitted manuscript.

Conflict of interest and funding
This study is unfunded. All authors have no conflicts or competing interests.

References
1. Pliego J, Wehbe-Janek H, Rajab MH, Browning JL, Fothergill RE. Ob/Gyn boot camp using high-fidelity human simulators: enhancing residents’ perceived competency, confidence in taking a leadership role, and stress hardiness. Simul Healthc 2008; 3: 82–9.
2. Birnbach DJ, Salas E. Can medical simulation and team training reduce errors in labor and delivery? Anesthesiol Clin 2008; 26: 159–68.
3. Nicholson WK, Ellison SA, Grason H, Powe NR. Patterns of ambulatory care use for gynecologic conditions: a national study. Am J Obstet Gynecol 2001; 184: 523–30.
4. ACGME program requirements for graduate medical education in emergency medicine. Accreditation Council for Graduate Medical Education; 2013. [cited 19 March 2015] Available from: http://www.acgme.org/acgmeweb/portals/0/pfassets/2013-pr-faq/pit/110_emergency_medicine_07012013.pdf
5. Kern D, Thomas P, Howard D, Bass E. Curriculum development for medical education: a six-step approach. Baltimore, MD: The Johns Hopkins University Press; 1998.
6. Counselman FL, Borenstein MA, Chisholm CD, Epter ML, Khandelwal S, Kraus CK, et al. The 2013 model of the clinical practice of emergency medicine. Acad Emerg Med 2014; 21: 574–98.
7. Glass DL, Rebstock J, Handberg E. Emergency Treatment and Labor Act (EMTALA): avoiding the pitfalls. J Perinat Neonatal Nurs 2004; 18: 103–14.
8. Ko PY, Scott JM, Mihai A, Grant WD. Comparison of a modified longitudinal simulation-based advanced cardiovascular life support to a traditional advanced cardiovascular life support curriculum in third year medical students. Teach Learn Med 2011; 23: 324–30.
9. Papageorgiou A, Miles S, Fromage M, Kemmy J, Leinster SJ. Cross-sectional evaluation of a longitudinal consultation skills course at a new UK medical school. BMC Med Educ 2011; 11: e55.
10. Deiorio N, Fitch MT, Jung J, Promes SB, Thibodeau LG, Wooley WL, et al. Evaluating educational interventions in emergency medicine. Acad Emerg Med 2012; 19: 1442–53.