ORIGINAL CLINICAL RESEARCH REPORT

The Most Influential Publications in Obstetric Anesthesiology, 1998–2017: Utilizing the Delphi Method for Expert Consensus

Sharon C. Reale, MD, Lawrence C. Tsen, MD, William R. Camann, MD, Brian T. Bateman, MD, MSc, and Michaela K. Farber, MD, MS

BACKGROUND: There have been many advances in obstetric anesthesiology in the past 2 decades. We sought to create a list of highly influential publications in the field using the Delphi method among a group of obstetric anesthesiology experts to create an important educational, clinical, and research resource.

METHODS: Experts in the field, defined as obstetric anesthesiologists selected to present the Gerard W. Ostheimer Lecture at the Society for Obstetric Anesthesia and Perinatology (SOAP) annual meeting within the past 20 years, were recruited to participate. The Delphi technique was used by administering 3 rounds of surveys. Participants were initially asked to identify the highly influential publications from the year they presented the Ostheimer lecture, in addition to the most influential publications from the time period overall. Highly influential publications were defined as those that changed traditional views, invoked meaningful practices, catalyzed additional research, and fostered ideas or practices that had durability over time. After each round of surveys, responses were collected and used as choices for subsequent surveys with the goal of obtaining group consensus.

RESULTS: We determined expert consensus on 22 highly influential publications from 1998 to 2017. The focus of these publications ranged from disease entities, interventions, treatment methodologies, and complications.

CONCLUSIONS: Key themes in the publications chosen included the reduction of maternal morbidity and mortality and refinements in the analgesic and anesthetic management of labor and delivery. (Anesth Analg 2020;131:239–44)

KEY POINTS

- **Question:** What are the recent highly influential publications in the field of obstetric anesthesiology?
- **Findings:** We created a list of 22 highly influential publications in the field using the Delphi method among a group of obstetric anesthesia experts.
- **Meaning:** We have created an important educational, clinical, and research resource.

GLOSSARY

CD = cesarean delivery; **CDC** = Centers for Disease Control; **PCEA** = patient-controlled epidural analgesia; **PPH** = postpartum hemorrhage; **RCT** = randomized controlled trial; **SOAP** = Society for Obstetric Anesthesia and Perinatology

Research in the subspecialty of obstetric anesthesiology has flourished over the past 2 decades. However, like in most specialties, only a select group of publications are considered "highly influential" by achieving a high citation index, creating significant advances in the field, or initiating a new area of study within or outside the field. Previous efforts within the field of anesthesiology and the wider practice of medicine to identify highly influential publications have typically focused on a bibliometric analysis or cited reference analysis; a few lists have been created using a nomination process by members of disease networks, with further refinements articulated by societal members or selected panelists.[1–7]

From the Department of Anesthesiology, Perioperative and Pain Medicine, Brigham and Women's Hospital, Harvard Medical School, Boston, Massachusetts.

Accepted for publication February 6, 2020.

Funding: B.T.B. is an investigator on grants to Brigham and Women's Hospital from the National Institutes of Health (NIH), Food and Drug Administration (FDA), Centers for Disease Control (CDC), Baxalta, Lilly, GlaxoSmithKline (GSK), Pfizer, and Pacira. He is a consultant to Aetion, Inc and the Alosa Foundation. B.T.B. served on an expert panel for a postpartum hemorrhage quality improvement project that was conducted by the Association of Women's Health, Obstetric and Neonatal Nurses and funded by a grant from Merck for Mothers. M.K.F. is an investigator on grants to Brigham and Women's Hospital from Pacira and Gauss Surgical.

The authors declare no conflicts of interest.

Supplemental digital content is available for this article. Direct URL citations appear in the printed text and are provided in the HTML and PDF versions of this article on the journal's website (www.anesthesia-analgesia.org).

Reprints will not be available from the authors.

Address correspondence to Sharon C. Reale, MD, Department of Anesthesiology, Perioperative and Pain Medicine, Brigham and Women's Hospital, 75 Francis St, CWN L1, Boston, MA 02115. Address e-mail to screale@bwh.harvard.edu.

DOI: 10.1213/ANE.0000000000004753

We sought to create a contemporary list of highly influential publications specific to obstetric anesthesiology, as defined by those changing traditional views on a topic, invoking meaningful practice changes, catalyzing additional research, or fostering ideas or practices that were durable and relevant over time. To identify such publications, we used a uniquely qualified panel of experts in the field, utilizing the Delphi Method to obtain input and consensus from the group. The Delphi method achieves group consensus using sequential rounds of questionnaires with anonymized participation and controlled feedback from the group in each iteration.[8,9]

The identification of highly influential publications should serve as an educational, clinical, and research resource for those interested in obstetric anesthesiology, and potentially define future research priorities for the subspecialty.

METHODS

Written informed consent was waived by the institutional review board; informed consent and authorization were implied by voluntary completion of our survey. This prospective, sequential survey study utilized the Delphi technique for consensus building. Twenty expert obstetric anesthesiologists, defined as those individuals who delivered the Gerard W. Ostheimer Lecture at the Society for Obstetric Anesthesia and Perinatology (SOAP) annual meeting from 1998 to 2017, were recruited.[10] This honorary lecture summarizes notable publications from the preceding year in the fields of anesthesiology, obstetrics and gynecology, perinatology, neonatology, and epidemiology, relevant to the subspecialty of obstetric anesthesiology. The lecturer is selected by a peer panel (ie, the SOAP Board of Directors) 1 year in advance of the lecture to allow for a comprehensive review of the literature, generation of a syllabus, delivery of a 1-hour lecture at the annual meeting, and publication of a summary of practice-changing articles.[11–20]

The Delphi technique was used by administering 3 rounds of surveys sent by e-mail. After each round, responses were collected and used as choices for subsequent surveys with the goal of obtaining group consensus for approximately 20 obstetric anesthesiology publications from 1998 to 2017.

In round 1, each expert was asked to identify 6 publications: the top 3 publications from the year covered in their Ostheimer lecture and 3 additional publications from 1998 to 2017. For each round, respondents were instructed to select highly influential publications defined as (1) yielding meaningful practice changes for obstetric anesthesiologists; (2) catalyzing more work by serving as a foundational basis for a topic of importance to obstetric anesthesiology; (3) altering traditional views on an obstetric anesthesiology topic; and (4) demonstrating durability over time. All publications specified in the surveys were collated by a single investigator (S.C.R.) who was not a participant in the survey. The results of each round were anonymized such that participants were not aware of each other's responses.

For round 2, each participant was asked to select 10 publications from a collated list from round 1. All publications identified in round 1 were included as options in round 2. The publications were presented in a random sequence, such that each participant's list was in a different order.

For the final round, round 3, the publications that were selected at least once during round 2 were grouped by the number of votes received, as follows: group 1, >10 votes; group 2, 6–10 votes; group 3, 3–5 votes; group 4, 1–2 votes. Publications were sorted by group and alphabetized within each group. Each participant was asked to select 20 publications, regardless of grouping. While the initial goal of this study was to identify 20 influential publications, the number of publications closest to 20 would be determined to be the top publications in the event of a tie. The total number of citations and citations per year of the round 3 publications were recorded, with these determinations made on Web of Science on August 6, 2019.

RESULTS

All 3 rounds of this survey were sent to participants and responses obtained between July 2018 and June 2019. Survey round 1 had a response rate of 100% and yielded 82 publications (Supplemental Digital Content, Table 1, http://links.lww.com/AA/D52). Round 2 had a response rate of 95% and yielded 57 publications that had at least 1 vote (Supplemental Digital Content, Table 2, http://links.lww.com/AA/D52). Round 3 had a response rate of 100% and yielded 22 publications that received 9 or more votes (Table). The remaining 35 publications received 7 or fewer votes.

DISCUSSION

The principal finding, through a method of nomination and Delphi method selection by 20 peer-selected obstetric anesthesiologists with specific expertise in the literature relevant to the field, was the identification of 22 highly influential scientific publications from 1998 to 2017. The focus of these publications ranged from disease entities, interventions, treatment methodologies, and complications.

Notable advances within these publications include enhancements in the provision of labor epidural analgesia,[21,22] recognition that early administration of neuraxial analgesia does not increase the risk of cesarean delivery,[27] identification of phenylephrine as the preferred postneuraxial anesthesia vasopressor

Table. Top Obstetric Anesthesia Papers by Category, Summary, Total Citations, Citation Average per Year, and Number of Votes in Round 3 of Survey

Citation	Summary	Total Citations	Citation Average/ Year	Votes in Round 3
Labor analgesia				
Comparative Obstetric Mobile Epidural Trial (COMET) Study Group UK[21]	RCT showing that lower dose epidural techniques conferred a lower risk of operative vaginal delivery compared to traditional higher dose techniques.	197	10.37	15
Sia et al[22]	RCT demonstrating that automated mandatory intermittent bolus techniques + PCEA resulted in decreased local anesthetic consumption compared to continuous infusion + PCEA.	55	4.23	9
Cesarean delivery				
Lydon-Rochelle et al[23]	Large, longitudinal, retrospective cohort study that found that a trial of labor after CD was associated with an increased risk of uterine rupture, particularly if labor was induced with prostaglandins.	503	26.47	9
Ngan Kee et al[24]	RCT establishing that a prophylactic phenylephrine infusion started after spinal for CD decreased the incidence and severity of hypotension without adverse effects on fetal acid-base status.	97	6.06	18
Ngan Kee et al[25]	RCT showing that ephedrine crosses the placenta to a greater extent than phenylephrine and suggests that phenylephrine may be the preferred vasopressor with regards to fetal oxygen supply and demand balance.	119	10.82	16
Ngan Kee et al[26]	RCT examining the effect of combining phenylephrine and ephedrine infusions, finding that as the proportion of phenylephrine decreased and the proportion of ephedrine increased, hemodynamic stability decreased, and fetal acid-base status worsened.	108	9.00	9
Wong et al[27]	RCT showing that receiving intrathecal opioids early in labor does not increase the risk of CD compared to parenteral opioids.	206	13.73	20
Postpartum hemorrhage				
Charbit et al[28]	Prospective multicenter study examining predictive markers of severe PPH, with fibrinogen being the only marker associated with severe PPH.	359	27.62	11
WOMAN Trial Collaborators[29]	Large, multicenter RCT which found that 1 g of tranexamic acid given within 3 h of delivery reduces death due to bleeding without adverse effects.	191	63.67	15
Hypertensive disorders of pregnancy				
Altman et al[30]	Large, randomized, multicenter, study demonstrating the effectiveness of magnesium sulfate in reducing the frequency of eclampsia without significant adverse effects.	749	41.61	15
Aya et al[31]	Prospective cohort study showing that patients with severe preeclampsia had less frequent and less severe postspinal hypotension compared to healthy controls.	79	4.65	16
Morbidity and mortality				
Creanga et al[32]	Retrospective review of CDC pregnancy mortality data, finding an increase in pregnancy-related mortality, particularly among African American women and also with increasing age.	299	59.80	10
D'Angelo et al[33]	Report compiled by the Society for Obstetric Anesthesia and Perinatology Research Committee from 30 institutions, describing serious complications related to anesthesia, the most common of which were high neuraxial block, respiratory arrest, and unrecognized intrathecal catheter.	77	12.83	17
Hawkins et al[34]	Review of anesthesia-related maternal deaths from the Pregnancy Mortality Surveillance System, which found a decrease in anesthetic-related maternal mortality and found decreasing case-fatality rates for general anesthesia, though these rates were still higher than those for neuraxial anesthesia.	124	13.78	9
Mhyre et al[35]	Study using the Nationwide Inpatient Sample that found 1 in 12,000 hospitalizations for delivery is complicated by cardiac arrest, most commonly due to PPH, heart failure, amniotic fluid embolism, and sepsis.	79	13.17	9
Mushambi et al[36]	Obstetric anesthesia specific guidelines for management of difficult and failed intubation during general anesthesia.	133	26.60	11
Shields et al[37]	Multicenter study showing that use of the Maternal Early Warning Trigger tool significantly reduces severe maternal morbidity by addressing the most common causes of maternal morbidity.	27	6.75	13
Thomas and Cooper[38]	Detailed discussion of selected illustrative cases of maternal deaths in the United Kingdom, in addition to an analysis of whether standard of care was met in each case.	63	3.50	9
Weinberg et al[39]	First study in larger animals demonstrating that lipid emulsion therapy is effective in rescuing dogs from bupivacaine-induced cardiac toxicity.	352	20.71	15
Pain				
Eisenach et al[40]	Prospective cohort study examining pain after CD versus vaginal delivery, demonstrating that CD does not increase the risk of postpartum pain or depression but pain after delivery does contribute to persistent pain and depression after childbirth.	181	15.08	12
Palmer et al[41]	Dose finding study illustrating that the optimal dose of intrathecal morphine for CD is likely no more than 100 μg.	151	7.19	15
Other				
Paech et al[42]	Multicenter RCT demonstrating that 20 mL is likely the optimum volume of blood for epidural blood patch administration, compared to 15 and 30 mL.	45	5.00	12

Abbreviations: CD, cesarean delivery; CDC, Centers for Disease Control; PCEA, patient-controlled epidural analgesia; PPH, postpartum hemorrhage; RCT, randomized controlled trial.

for prophylaxis and/or treatment of maternal hypotension,[24–26] demonstration that tranexamic acid decreases the risk of maternal death due to postpartum hemorrhage,[29] identification and prevention of anesthesia-related maternal morbidity and mortality,[32–35,37,38] recognition of the value of magnesium sulfate administration in preeclampsia,[30] and the development of lipid emulsion therapy to treat bupivacaine-induced cardiac toxicity.[39]

The majority of the publications were scientific, hypothesis-driven studies with a citation average per year of >10; there were no review articles, although 1 consensus document was selected.[36] Half of the publications were from the first 10 years of the study period.

The principal strength of this study was the use of recognized academic anesthesia experts, selected by a board of specialty leaders, who had each vigorously reviewed, evaluated, and presented a single year of published literature relevant to obstetric anesthesiology. These individuals possessed a comprehensive knowledge of the available literature within the study period, triaged the studies for the creation of their syllabus and presentation, and used their syllabus to identify the selected publications. We were able to recruit all 20 (100%) annual lecturers from 1998 to 2017; participation in each survey round was similarly robust. We believe this method to be better than bibliometric methodologies or selections among members of a group,[43,44] which have been criticized for giving credit to partial results, reflecting primarily methodologies or terminology, indicating common background reading or reflecting the citation of specific colleagues or oneself.[45] We also believe the Delphi method to be a robust mechanism to drive consensus among this geographically dispersed group of experts; by contrast, the nominal group technique and the RAND technique require face-to-face interviews. A final strength is the recent time frame associated with the study; this thus delivers publications that have contemporary relevance.

Limitations in our study include the potential to have each expert's selections miss some critically important papers, have a slight bias in favor of older publications, or represent self-citation by experts, most of whom conducted research. However, only 2 of 82 publications from round 1 represented self-suggestions. Furthermore, these concerns were limited by use of the Delphi method, which challenges all participants and anonymizes the selections made by individual experts.[46] Although older publications may enjoy greater familiarity and citations, our citations were evenly divided between those in the first 10 years of the study period, compared to the last 10. Finally, although we set no language or journal limitations, there was likely a bias toward English language papers.

The field of obstetric anesthesiology is evolving, as reflected in the breadth and scope of these high-impact publications. This list captures the central tenets of obstetric anesthesiology: maternal and newborn safety and satisfaction. Continued efforts toward lowering maternal morbidity and mortality, optimizing pain relief, understanding preeclampsia and other maternal medical comorbidities, managing postpartum hemorrhage, and refining maternal hemodynamics during labor and delivery remain important priorities for future obstetric anesthesiology research.

ACKNOWLEDGMENTS

The authors thank the previous Ostheimer lecturers for their participation in our survey: Audrey Alleyne, MD; Katherine Arendt, MD; Brian Bateman, MD, MSc; Brenda Bucklin, MD; Alexander Butwick, MBBS, FRCA, MS; Roshan Fernando, FRCA; Ashraf Habib, MB, BCh, MHSc, FRCA; Philip Hess, MD; McCallum Hoyt, MD; Ruth Landau, MD; Lisa Leffert, MD; Alison Macarthur, MD, MSc, FRCPC; Jill Mhyre, MD; Arvind Palanisamy, MD, FRCA; Linda Polley, MD; B. Scott Segal, MD; John Sullivan, MD, MBA; Paloma Toledo, MD; Lawrence Tsen, MD; and David Wlody, MD.

DISCLOSURES

Name: Sharon C. Reale, MD.
Contribution: This author helped design and conduct the study, analyze the data, and write the manuscript.
Name: Lawrence C. Tsen, MD.
Contribution: This author helped design and conduct the study, analyze the data, and write the manuscript.
Name: William R. Camann, MD.
Contribution: This author helped design and conduct the study, analyze the data, and write the manuscript.
Name: Brian T. Bateman, MD, MSc.
Contribution: This author helped design and conduct the study, analyze the data, and write the manuscript.
Name: Michaela K. Farber, MD, MS.
Contribution: This author helped design and conduct the study, analyze the data, and write the manuscript.
This manuscript was handled by: Jill M. Mhyre, MD.

REFERENCES

1. Barash P, Bieterman K, Hersey D. Game changers: the 20 most important anesthesia articles ever published. *Anesth Analg*. 2015;120:663–670.
2. Webster N, Galley H. *Landmark Papers in Anaesthesia*. Oxford, UK: Oxford University Press; 2013.
3. Zhou J, Agarwal N, Hamilton DK, Koltz MT. The 100 most influential publications pertaining to intracranial aneurysms and aneurysmal subarachnoid hemorrhage. *J Clin Neurosci*. 2017;42:28–42.
4. Zhou JJ, Koltz MT, Agarwal N, et al. 100 most influential publications in scoliosis surgery. *Spine (Phila Pa 1976)*. 2017;42:336–344.
5. Borjan J, Gonzales-Luna AJ, Carlson TJ, et al. Significant publications on infectious diseases pharmacotherapy in 2018. *J Pharm Pract*. 2019;32:546–557.

6. Massachusetts Medical Society. The most important NEJM article. Available at: https://web.archive.org/web/20121117232552/http:/nejm200.nejm.org/vote/vote-nejm-article/. Accessed September 12, 2019.
7. Payne D. Twenty top papers to mark The BMJ's two digital decades. *BMJ.* 2015;351:h3660.
8. Diamond IR, Grant RC, Feldman BM, et al. Defining consensus: a systematic review recommends methodologic criteria for reporting of Delphi studies. *J Clin Epidemiol.* 2014;67:401–409.
9. Falzarano M, Pinto Zipp G. Seeking consensus through the use of the Delphi technique in health sciences research. *J Allied Health.* 2013;42:99–105.
10. Society for Obstetric Anesthesia and Perinatology. Honorary lectures. Available at: https://soap.org/grants/honorary-lectures/. Accessed January 7, 2020.
11. Habib AS. What's new in obstetric anesthesia? The 2017 Gerard W. Ostheimer lecture. *Anesth Analg.* 2019;129:168–175.
12. Habib AS. What's new in obstetric anesthesia in 2017? *Int J Obstet Anesth.* 2019;38:119–126.
13. Bateman BT. What's new in obstetric anesthesia: a focus on maternal morbidity and mortality. *Int J Obstet Anesth.* 2019;37:68–72.
14. Bateman BT. What is new in obstetric anesthesia: the 2017 Gerard W. Ostheimer lecture. *Anesth Analg.* 2019;128:123–127.
15. Hess PE. What's new in obstetric anesthesia: the 2016 Gerard W. Ostheimer lecture. *Anesth Analg.* 2017;124:863–871.
16. Hess PE. What's new in clinical obstetric anesthesia in 2015? *Int J Obstet Anesth.* 2017;32:54–63.
17. Arendt KW. The 2015 Gerard W. Ostheimer lecture: what's new in labor analgesia and cesarean delivery. *Anesth Analg.* 2016;122:1524–1531.
18. Arendt KW. The 2016 Hughes lecture: what's new in maternal morbidity and mortality? *Int J Obstet Anesth.* 2016;26:59–70.
19. Leffert L. What's new in obstetric anesthesia: the 2014 Gerard W. Ostheimer lecture. *Anesth Analg.* 2015;120:1065–1073.
20. Leffert LR. What's new in obstetric anesthesia? Focus on preeclampsia. *Int J Obstet Anesth.* 2015;24:264–271.
21. Comparative Obstetric Mobile Epidural Trial Study Group UK. Effect of low-dose mobile versus traditional epidural techniques on mode of delivery: a randomised controlled trial. *Lancet*. 2001;358:19–23.
22. Sia AT, Lim Y, Ocampo C. A comparison of a basal infusion with automated mandatory boluses in parturient-controlled epidural analgesia during labor. *Anesth Analg.* 2007;104:673–678.
23. Lydon-Rochelle M, Holt V, Easterling TR, Martin DP. Risk of uterine rupture during labor among women with a prior cesarean delivery. *N Engl J Med*. 2001;345:3–8.
24. Ngan Kee WD, Khaw KS, Ng FF, Lee BB. Prophylactic phenylephrine infusion for preventing hypotension during spinal anesthesia for cesarean delivery. *Anesth Analg.* 2004;98:815–821.
25. Ngan Kee WD, Khaw KS, Tan PE, Ng FF, Karmakar MK. Placental transfer and fetal metabolic effects of phenylephrine and ephedrine during spinal anesthesia for cesarean delivery. *Anesthesiology.* 2009;111:506–512.
26. Ngan Kee WD, Lee A, Khaw KS, Ng FF, Karmakar MK, Gin T. A randomized double-blinded comparison of phenylephrine and ephedrine infusion combinations to maintain blood pressure during spinal anesthesia for cesarean delivery: the effects on fetal acid-base status and hemodynamic control. *Anesth Analg.* 2008;107:1295–1302.
27. Wong CA, Scavone BM, Peaceman AM, et al. The risk of cesarean delivery with neuraxial analgesia given early versus late in labor. *N Engl J Med.* 2005;352:655–665.
28. Charbit B, Mandelbrot L, Samain E, et al. The decrease of fibrinogen is an early predictor of the severity of postpartum hemorrhage. *J Thromb Haemost*. 2007;5:266–273.
29. WOMAN Trial Collaborators. Effect of early tranexamic acid administration on mortality, hysterectomy, and other morbidities in women with post-partum haemorrhage (WOMAN): an international, randomised, double-blind, placebo-controlled trial. *Lancet*. 2017;389:2105–2116.
30. Altman D, Carroli G, Duley L, et al; Magpie Trial Collaboration Group. Do women with pre-eclampsia, and their babies, benefit from magnesium sulphate? The Magpie Trial: a randomised placebo-controlled trial. *Lancet.* 2002;359:1877–1890.
31. Aya AG, Mangin R, Vialles N, et al. Patients with severe preeclampsia experience less hypotension during spinal anesthesia for elective cesarean delivery than healthy parturients: a prospective cohort comparison. *Anesth Analg*. 2003;97:867–872.
32. Creanga AA, Berg CJ, Syverson C, Seed K, Bruce FC, Callaghan WM. Pregnancy-related mortality in the United States, 2006-2010. *Obstet Gynecol.* 2015;125:5–12.
33. D'Angelo R, Smiley RM, Riley ET, Segal S. Serious complications related to obstetric anesthesia: the serious complication repository project of the Society for Obstetric Anesthesia and Perinatology. *Anesthesiology.* 2014;120:1505–1512.
34. Hawkins JL, Chang J, Palmer SK, Gibbs CP, Callaghan WM. Anesthesia-related maternal mortality in the United States: 1979-2002. *Obstet Gynecol.* 2011;117:69–74.
35. Mhyre JM, Tsen LC, Einav S, Kuklina EV, Leffert LR, Bateman BT. Cardiac arrest during hospitalization for delivery in the United States, 1998-2011. *Anesthesiology.* 2014;120:810–818.
36. Mushambi MC, Kinsella SM, Popat M, et al; Obstetric Anaesthetists' Association; Difficult Airway Society. Obstetric Anaesthetists' Association and Difficult Airway Society guidelines for the management of difficult and failed tracheal intubation in obstetrics. *Anaesthesia.* 2015;70:1286–1306.
37. Shields LE, Wiesner S, Klein C, Pelletreau B, Hedriana HL. Use of maternal early warning trigger tool reduces maternal morbidity. *Am J Obstet Gynecol.* 2016;214:527.e1–527.e6.
38. Thomas TA, Cooper GM; Editorial Board of the Confidential Enquiries into Maternal Deaths in the United Kingdom. Maternal deaths from anaesthesia. An extract from why mothers die 1997-1999, the confidential enquiries into maternal deaths in the United Kingdom. *Br J Anaesth.* 2002;89:499–508.
39. Weinberg G, Ripper R, Feinstein DL, Hoffman W. Lipid emulsion infusion rescues dogs from bupivacaine-induced cardiac toxicity. *Reg Anesth Pain Med.* 2003;28:198–202.
40. Eisenach JC, Pan PH, Smiley R, Lavand'homme P, Landau R, Houle TT. Severity of acute pain after childbirth, but not type of delivery, predicts persistent pain and postpartum depression. *Pain*. 2008;140:87–94.
41. Palmer CM, Emerson S, Volgoropolous D, Alves D. Dose-response relationship of intrathecal morphine for postcesarean analgesia. *Anesthesiology*. 1999;90:437–444.
42. Paech MJ, Doherty DA, Christmas T, Wong CA; Epidural Blood Patch Trial Group. The volume of blood for epidural blood patch in obstetrics: a randomized, blinded clinical trial. *Anesth Analg*. 2011;113:126–133.

43. Park KM, Park BS, Park S, Yoon DY, Bae JS. Top-100 cited articles on headache disorders: a bibliometric analysis. *Clin Neurol Neurosurg.* 2017;157:40–45.
44. Lai P, Liu YH, Xue JH, He PC, Qiu YQ. The 100 most-cited articles on aortic dissection. *BMC Cardiovasc Disord.* 2017;17:30.
45. Werner R. The focus on bibliometrics makes papers less useful. *Nature.* 2015;517:245.
46. Humphrey-Murto S, Varpio L, Wood TJ, et al. The use of the Delphi and other consensus group methods in medical education research: a review. *Acad Med.* 2017;92:1491–1498.