



Society for Obstetric Anesthesia and Perinatology

www.soap.org

Newsletter
Newsletter

Winter 2005



M. Joanne Douglas, MD, FRCP

2004 has been an exciting year for SOAP. SOAP's influence has spread through the introduction of the Obstetrics track at the ASA Annual Meeting in Las Vegas, and several new endeavors approved by the Board of Directors should expand SOAP's influence even more.

The introduction of the Obstetrics track at the ASA Annual Meeting was extremely successful with excellent attendance at the events that I observed. Attendees were challenged with new, up-to-date information through the refresher courses, panels (including the SOAP breakfast panel), debates, PBL discussions and scientific papers. A special thanks to David Wlody who coordinated the program and to those who participated. Next year at the ASA there will be a joint SOAP-Anesthesiology session focusing on the best obstetric anesthesia research. Start planning your research projects now so that you can submit your abstract for possible inclusion in this prestigious session.

At the Board meeting Dr. Medge Owen reported on the successful initial venture to Turkey of a group of SOAP and OAA members. This occurred in September and those that went had an exciting time teaching

President's Message

an eager group of anesthesiologists. There was extensive press coverage of this event in Turkey. The Board approved the permanent formation of the International Outreach Committee and drafting of the appropriate change to SOAP Bylaws. Dr. Medge Owen was approved as Chair of that Committee.

Other outreach endeavors include the involvement of SOAP at the joint North American Society of Obstetric Medicine (NASOM)/Society of Maternal Fetal Medicine Meeting in Reno in February and inclusion of our obstetric medicine colleagues in the SOAP Annual Meeting at Palm Desert. There is a link to NASOM on our SOAP website. SOAP has received a proposal from International Anesthesiology Clinics to coordinate an issue on obstetric anesthesia. This has been placed in the capable hands of our Publications and Education committees. As well, an article on SOAP will appear in the upcoming newsletter of the Association of University Anesthesiologists. Two SOAP members, Drs. Wlody and Polley, are the new OB Anesthesia editors for *Anesthesiology News*.

The Board regretfully accepted the resignation of Dr. Gerry Bassell as Chair of the Membership Committee and appointed Dr. Gary Vasdev to replace him. At the Board meeting in Las Vegas, Dr. Vasdev presented some innovative ideas designed to expand our membership. With his interest in this area he was a natural to become the new Membership Chair. Dr. David Wlody announced his intention to step down as Newsletter Editor at the Annual meeting in May 2005. He has done an excellent job. Dr. Michael Smith has been appointed to replace him.

Dr. Vasdev did a presentation at the Board meeting on the possibility of a joint SOAP/OAA (Obstetrics Anaesthetists' Association) meeting in Dublin, Ireland in August 2006. Considerable background work went into this proposal and the Board approved moving it to the next stage, which will look in detail at financial and other implications. Expect to hear more in future Newsletters and SOAP meetings.

Following the Board meeting in Las Vegas, Dr. Joy Steadman notified SOAP that she would be unable to serve as Host at the 2006 Annual Meeting in Miami, due to other commitments. Her resignation has been accepted and Drs. David Birnbach and Jose Carvalho have agreed to co-host that meeting.

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President's Message

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As all of you are aware we have had almost one year of IARS management of our affairs. The Board is happy to report that the change in management has resulted in considerable financial savings to our Society (watch for the Treasurer's report in the next Newsletter). There has been a steep learning curve for the management staff but they have coped well and there have been very few glitches. Special thanks to Pamela Happ and her highly effective team.

Some changes to the Bylaws (see Page 5) will be presented at the Business Meeting in Palm Desert. Additional revisions will be listed in the next issue of the Newsletter.

In order to ensure that proposals to host future SOAP meetings are properly researched prior to the Annual meeting, the Board approved the idea that suggestions for sites must be submitted to the SOAP management team before the end of November, prior to the year of their presentation at the annual meeting. This will allow our management team to ensure that the proposed city has adequate and appropriate facilities for our annual meeting.

With the above exciting endeavors I would urge you to consider becoming more actively involved in SOAP. In addition to the SOAP committees there are opportunities for you to participate in the workshops that are held at our annual meeting and at meetings of other societies with goals similar to ours. Become involved and help expand our subspecialty and Society!

The ASA Annual Meeting and the Obstetric Anesthesia Track

The most recent Annual Meeting of the American Society of Anesthesiologists held in Las Vegas marked the beginning of an experiment that will determine the structure of future meetings. A common complaint that has been expressed by ASA members is that the educational offerings in a given subspecialty are so spread out that those with limited time to spend at the meeting cannot possibly attend them all. To remedy this situation, and also to increase participation of the subspecialty societies in the planning of the annual meeting, in 2003 then-President James Cottrell appointed a task force of obstetric anesthesiologists to plan an OB track, in which the great majority of activities in the specialty would occur over a two day period. The task force, consisting of Dick Wissler, Joy Hawkins, David Birnbach, Bill Camann, and David Wlody was given free rein to plan panels, refresher courses, clinical forums, and any other innovative educational activities that would appeal to both the full-time obstetric anesthesiologist, as well as the occasional visitor to the labor and delivery suite. Since all of the OB activities were planned by this small group, we were able to insure that there would be minimal redundancy of topics covered. Additionally, since the task force assumed responsibility for scheduling the OB track, every effort was made to ensure that when two activities were offered simultaneously, they would each appeal to different audiences. By all accounts, this experiment has been a great success. A survey of SOAP members showed widespread approval of the concept, and preliminary data from ASA show similar approval from the membership at large.

At the risk of leaving out equally worthy activities, I would like to mention some of the more memorable events that were held in Las Vegas. The Refresher Course sessions are always a great success, and this year was no exception, with veterans David Chestnut, Joy Hawkins, and Mark Norris joined by newcomers Don Penning, Robert Gaiser, and Lawrence Tsen. The Sol Shnider Breakfast Panel, entitled "New Horizons in OB Anesthesia," was moderated by Alan Santos and highlighted the work of Valerie Arkoosh, Ed Riley, and Ruth Cahana, and provided a preview of the changes that we can expect to see in OB anesthesia in the coming years. And certainly anyone who witnessed the debate between Susan Palmer and Pete Pan on the necessity for wearing a mask during neuraxial anesthesia (Susan in favor of masks and Pete opposed) will remember the Herculean efforts of each speaker to convert the audience to their point of view.

At this writing, the OB task force is completing its planning for the 2005 Annual Meeting. We are sure this process will yield an even more successful meeting next year.

David Wlody, Chair
Obstetric Anesthesia Planning Committee
ASA Task Force on Annual Meeting
Opportunities

**Submit your abstracts for the SOAP 37th Annual Meeting.
The Submission deadline is January 14, 2005.
Visit www.soap.org for instructions and abstract site link.**

Report of SOAP International Outreach Committee

Turkey: On September 19, 2004, eight obstetric anesthesiologists landed in Istanbul, Turkey to inaugurate the first international obstetric anesthesia teaching trip. The participants included: Elizabeth Bell (UNC), Terry Breen (Duke), Brittany Clyne (Wake Forest), Jimmy Gardiner (Dublin, Ireland), Medge Owen (Wake Forest), Marge Sedensky (UHS Cleveland), Mark Scrutton (Bristol, UK), and Jessica Wolin (TUFTS). A 2-day group orientation was conducted in Istanbul after which the visiting doctors spread out for one week to work in 10 hospitals throughout Turkey. The result was a wonderful medical and cultural exchange summarized by several of the Turkish doctors.

Dr. Idil Tekin from Celal Bayar University wrote, "Through this program, we had the opportunity to meet esteemed, distinguished scientists. Instead of going to conferences and being able to only discuss limited topics in limited times there, they came here and paid attention to only our problems for a whole week. We are very grateful because our guests were very open to all of our questions and enthusiastic to help us. Together with beautiful memories, pictures, friendships, and cultural awareness, this program also helped us realize what we're doing, plan future projects, and set new goals. As one of the best parts of this program, we'll keep in touch and continue to communicate." And from Dr. Bilgi Karsli from Akdeniz University, "We organized a seminar together with the obstetrics clinic. Our guest talked about his studies and the obstetricians were very impressed. Now, the obstetric analgesia number is rapidly increasing in our hospital. Before this program, it was our job to convince the patients; now the obstetricians guide the patients to us for obstetric analgesia. This program was very beneficial for us. Thank you again for giving us this opportunity and support."

As an unplanned extra, our visit sparked a barrage of media attention including a front-page article in a major national Turkish newspaper and three television programs on the issues of cesarean section and regional anesthesia. A final program aired the week following our visit, in which a patient underwent a cesarean section with regional

anesthesia live on prime time Turkish national television. Obviously, we hit the nail on the head, because the topics of cesarean section and regional analgesia/anesthesia are of interest to the Turkish public at large, not just isolated medical professionals! A big thank you to our sponsors: WFSA, OAA, SOAP, Kybele Inc., Iontek Ltd., B.Braun, Baxter Int., the Turkish host hospitals and Wake Forest University. More than \$20,000 was raised to cover expenses.

Georgia: Medge Owen went to the Republic of Georgia October 4-7, 2004 to screen conditions for an upcoming trip. Dr. Owen went at the invitation of Robin Sizemore of Carolina Adoption Services, who coordinates humanitarian relief efforts in Georgia. Robin has established a superb infrastructure providing furnished apartments with cooks, drivers, and translators for \$60.00/day. As a starting point, a progressive private hospital specializing in childbirth would like a team to return with 2 obstetric anesthesiologists, 1 ob-gyn and 1 neonatologist. They are also interested in developing a clinical research collaboration. A date has not been set but the site is ready and waiting. Anyone interested in going should contact Medge Owen (mowen@wfubmc.edu).

Ghana: November 3-11, 2004, Yemi Olufolabi (Duke), Vernon Ross (Wake Forest) and Medge Owen went to Accra, Ghana to teach at what the African organizers hope to be an annual meeting of Obstetric Anesthesia and Newborn Resuscitation. The meeting objective was to review maternal and perinatal morbidity and mortality in Ghana, high risk obstetrics cases, obstetric anesthesia and care of the newborn. The multidisciplinary meeting was attended by representatives from the World Health Organization, obstetricians, midwives, anesthetists, and pediatricians. The US team observed the inner workings of Korle Bu Teaching Hospital's labor and delivery unit having 12,000 births/year. We are seeking 6-8 obstetric anesthesiologists to volunteer for the next trip planned October or November 2005. If interested, contact Yemi Olufolabi (olufo001@hotmail.com).

Mongolia: Dr. Gary Vasdev (Mayo Rochester) is planning a conference in Mongolia for August or September 2005. We hope to use this trip as a site visit to several hospitals to learn about childbirth conditions, build friendships with local physicians and plan how we can help in the future. Anyone

interested should contact Gary Vasdev (vasdev.gurinder@mayo.edu).

Croatia: Plans are underway to send a team to Croatia in September 2005. A 2-week format similar to the one used in Turkey will be tailored to Croatia. Anyone interested in going should contact Medge Owen (mowen@wfubuc.edu).

By Medge Owen, MD
Committee Chair
mowen@wfubmc.edu



**Make plans to attend the next
SOAP Meeting**

**SOAP 37th Annual Meeting
Desert Springs
A JW Marriott Resort and Spa
Palm Desert, CA
May 4-7, 2005**

**SOAP 38th Annual Meeting
Fontainebleau Hilton Resort
Miami Beach, FL
April 19-23, 2006**

**SOAP 39th Annual Meeting
Fairmont Banff Springs
"Castle in the Rockies"
Alberta, Canada
May 16-19, 2007**

What is Obstetric Medicine and the North American Society of Obstetric Medicine?

Raymond Powrie, MD, FRCP(C), FACP

*Division of Obstetric and Consultative Medicine
Women and Infants' Hospital of Rhode Island
Providence, Rhode Island*

When medical illness occurs during pregnancy, many women may feel neglected by the health care system. Their obstetrician may be comfortable with the obstetric aspects of their care, but may lack the expertise to feel confident managing their medical problems. The medical provider may be comfortable managing the woman's comorbidities, but may feel anxious and "out of their element" when considering investigations and treatment options in the context of pregnancy.

'Obstetric medicine' is the term used to describe the small but growing field that hopes to bridge this gap by making medical problems in pregnancy a distinct area of practice and research. The North American Society of Obstetric Medicine (NASOM) was formed over 15 years ago to serve as the academic, educational and clinical forum for individuals interested in obstetric medicine.

Most of NASOM's members are internists, medical sub-specialists or maternal fetal medicine physicians, but our membership includes obstetricians, family physicians, nurse practitioners, nurse midwives, teratologists and anesthesiologists. Our membership includes clinicians, educators and researchers. Most of our members have academic affiliations but we also welcome clinicians in private practice. In fact, NASOM hopes to bring together anyone with an interest in obstetric medicine. We believe that keeping our membership broad will be the best way to stimulate new ideas and thereby promote expertise and research in our field.

Regardless of our background, specialty or focus, all members of NASOM share a passion for helping women with medical illness to have the best possible outcome for themselves and their pregnancies. As women delay childbearing until later in life and women with serious medical conditions become increasingly able to conceive, we feel that the need for 'hard data' and improved expertise in

obstetric medicine is becoming increasingly pressing.

NASOM believes that the needs of women with medical illness in pregnancy are best served by collaborative efforts between obstetricians, perinatologists and medical subspecialists. Our society therefore aims to promote collaboration in both education and research about medical problems in pregnancy. These goals are pursued through our annual scientific meeting, our website (www.obmed.org) and our involvement with the American College of Physicians (ACP), the Society of General Internal Medicine (SGIM), the Society of Maternal Fetal Medicine (SMFM) and the International Society of Obstetric Medicine (ISOM). ACP has been particularly supportive of our endeavors and has published a book by obstetric internists called 'Medical Care of the Pregnant Woman' to help educate internists and medical subspecialists about how to provide care for medical illness in pregnancy.

NASOM is also presently in the midst of 'tearing down' and rebuilding its old website. Once updated, it will be an important place to keep up with activities and opportunities within NASOM. Watch for our new site at the same address in January 2005.

Our present executive members are:

President:

Linda Barbour
Endocrinologist, University of Colorado

Vice President:

Raymond Powrie
General Internist, Brown University

Secretary/Treasurer:

Erin Keely
Endocrinologist, University of Ottawa

Our members at large include:

Lucia Larson

General Internist, Brown University

Murph Goodwin, Maternal Fetal
Medicine, University of Southern California

Martin Montoro, Endocrinologist,
University of Southern California

Marc Rodgers

Hematologist, University of Ottawa

Alan Karovitch

General Internist, University of Ottawa

Rshmi Khurana

General Internist, University of Alberta

How can SOAP and NASOM work together?

NASOM is very aware that obstetric anesthesiologists are critical members of the team caring for the medically compromised pregnant woman. Over the past year, NASOM executive members have met with SOAP leaders and have actively sought ways to collaborate and use our skills to the enrichment of both Societies.

We began this endeavor by having Dick Wissler provide a keynote talk at the NASOM 2004 Annual Meeting held in July in Vancouver in conjunction with the North American Society for the Study of Hypertension in Pregnancy. His talk was very enthusiastically received by our membership. Joanne Douglas was also a welcome participant at our meeting. We are continuing this new endeavor by having Bill Camann speak on respiratory emergencies and issues related to regional anesthesia and anticoagulation at our 2005 meeting.

Just as SOAP members have begun to appear at NASOM meetings, NASOM members have begun to make contributions to SOAP. Peg Miller from Brown University participated in the critical care update program at the 2004 SOAP meeting. At the 2005 SOAP Annual Meeting, there will be an inaugural 'Update in Obstetric Medicine' lecture given by Raymond Powrie from Women and Infants' Hospital of Rhode Island. We hope such interaction between NASOM and SOAP will help to forge bonds that can lead to effective future collaboration. To this end, NASOM has already expressed a great interest in participating in SOAP's international endeavors by sending NASOM members to participate in joint educational programs in resource-poor nations. We would be delighted to hear from any of you about other creative and useful ways to put our shared passions together to the benefit of our patients.

The next meeting of NASOM is being held in conjunction with the Society of Maternal Fetal Medicine (SMFM) 2005 Annual Meeting on February 8-12th in Reno, Nevada. It will begin on February 8th with a day-long educational course on medical problems in pregnancy, co-sponsored by NASOM and SMFM.

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What is Obstetric Medicine and the North American Society of Obstetric Medicine?

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This course will be followed that evening by a NASOM focus group that will address issues related to thromboprophylaxis for cesarean delivery and the use of oral hypoglycemic agents in pregnancy. On February 9th, NASOM will conduct its annual scientific meeting with presentation of abstracts and interesting case reports. There will also be invited speakers providing updates on HIV, neurology and thyroid disease in pregnancy. SOAP members are encouraged to attend this meeting. Complete information on registration can be obtained at www.obmed.org and www.sfm.org or by contacting Erin Keely at: ekeely@ottawahospital.on.ca.

The International Society of Obstetric Medicine (ISOM) was formed two years ago by a group of obstetric medicine leaders from regional societies of obstetric medicine from around the world. ISOM meets every two years in conjunction with the International Society for the Study of Hypertension in Pregnancy (ISSHP). This year's meeting was held in Vienna November 14-15th. Further information can be found at www.isshp2004-vienna.at.

How does one train in obstetric medicine?

Obstetric Medicine has no specialty board or certification. Most of our practitioners have learned their skills through 'on the job training' or obtaining informal training with a colleague already working in the field. However, several formal fellowship training programs do exist. Brown University and Women and Infants' Hospital of Rhode Island have North America's longest running

obstetric medicine fellowship dedicated to training internists in the care of medical illness in pregnancy. The fellowship was founded in 1992 by Dr. Karen Rosene Montella and is funded by Women and Infants' Hospital as an innovative program that the Hospital hopes will have a broad impact on ensuring good outcomes for difficult pregnancies. Individuals interested in learning about the fellowship can contact the fellowship director Raymond Powrie at Raymond_powrie@brown.edu or obtain further information at: www.obmed.org.

If you have any interests or questions about the NASOM or obstetric medicine, or have any ideas about how NASOM and SOAP can work together, please do not hesitate to contact either Raymond_powrie@brown.edu or lynn.barbour@uchsc.edu.

SOAP Member Items:

The following addition to the SOAP Bylaws has been approved by the Board of Directors and will be presented to the General Membership during the Business Meeting for approval by Members:

INDEMNIFICATION OF DIRECTORS, OFFICERS, EMPLOYEES AND AGENTS

The Board shall indemnify its officers, directors, employees and agents to the extent permitted by the General Corporation Law of the State of California.

Addition of the International Outreach Committee to the Bylaws will appear in our next newsletter.

SOAP Media Award

The Publications Committee is soliciting nominations for the SOAP Media Award. The award will be given to that piece from the print or broadcast media that best represents the specialty of obstetric anesthesia to the general public. This award will be presented at the Annual Meeting. Please send your nominations via e-mail to soaphq@soap.org.

Call for Officer Nominations

The following offices will be filled at this year's annual meeting in Palm Desert: 2nd Vice President, Treasurer, Director at Large, and Alternate Delegate to the ASA. The 2nd Vice President automatically rises to President after serving as 1st Vice President and President-elect. Please contact Andrew Harris or Joy Hawkins for an explanation of the duties and responsibilities of the ASA Alternate Delegate. Please send your nominations or questions to soaphq@soap.org.

Membership Committee

After many years of service, Dr. Gerry Bassell has resigned as Chair of the SOAP Membership Committee. Dr. Gary Vasdev has agreed to take on this role. Any SOAP member wishing to join the Committee, or who has ideas about how to increase membership should contact Dr. Vasdev at: vasdev.gurinder@mayo.edu.

SOAP 37th Annual Meeting – Scientific Program

May 4-7, 2005 – Palm Desert, California

Wednesday, May 4, 2005

- 2:00 - 6:00 pm **Workshop on Neonatal Resuscitation Program (by ticket only - limited registration)**
Gurinder M. S. Vasdev, MD;
Edwin H. Rho, MD; et al.
- 6:00 - 8:00 pm **SOAP Opening Reception**

Thursday, May 5, 2005

- 7:00 - 7:45 am **Breakfast with Exhibitors; Posters**
- 7:45 - 8:00 am **Opening Remarks and Welcome**
M. Joanne Douglas, MD, FRCP
William R. Camann, MD
Mark I. Zakowski, MD
- 8:00 - 9:30 am **Gertie Marx Symposium (6)**
Moderator: G. M. Bassell, MD
Judges: Yaakov Beilin, MD;
M. Joanne Douglas, MD, FRCP;
Alan C. Santos, MD, MPH;
Richard N. Wissler, MD, PhD
- 9:30 - 9:45 am **Distinguished Service Award**
Awarded to Frederick P. Zuspan, MD
Presenter: M. Joanne Douglas, MD, FRCP
- 9:45 - 10:15 am **Coffee with Exhibitors; Posters**
- 10:15 - 11:30 am **Oral Presentations (5)**
Moderator: Pamela Flood, MD
- 11:30 - 12:30 pm **Fred Hehre Lecture: Pain and Delivery - Why, What, and When**
Introduction: M. Joanne Douglas, MD, FRCP
James C. Eisenach, MD
- 12:30 - 1:30 pm **Lunch with Exhibitors; Posters**
- 1:30 - 2:30 pm **What's New in Obstetrics?**
Introduction: William R. Camann, MD
Errol R. Norwitz, MD, PhD
- 2:30 - 3:30 pm **Zuspan Award Symposium (4)**
Moderator: John Thomas, MD
Judges: Joy L. Hawkins, MD;
Ruth Landau, MD;
Raymond Powrie, MD, FRCP(C), FACP;
Gurinder M. S. Vasdev, MD
- 3:30 - 4:00 pm **Coffee Break with Exhibitors; Posters**
- 4:00 - 6:00 pm **SOAP Business Meeting - Awards Presentations**
Moderator: M. Joanne Douglas, MD, FRCP

Friday, May 6, 2005

- 6:00 - 7:00 am **Fun Run/Walk**
- 7:00 - 8:00 am **Breakfast with Exhibitors; Posters**
- 8:00 - 9:00 am **Oral Presentations (4)**
Moderator: Felicity Plaat, MD
- 9:00 - 10:00 am **What's New in Obstetric Medicine**
Introduction: William R. Camann, MD
Raymond Powrie, MD, FRCP(C), FACP
- 10:00 - 10:30 am **Coffee with Exhibitors; Posters**

Friday, May 6, 2005 – continued

- 10:30 - 11:30 am **Poster Review #1**
Moderator:
Alison J. MacArthur, MD, MSc, FRCPC
- 11:30 - 1:00 pm **Panel Discussion: International Aspects of Obstetric Anesthesia**
Moderator: William R. Camann, MD
Panelists: Yasodananda Kumar Areti, MD;
Jose Carvalho, MD, PhD, FRCPC;
Medge D. Owen, MD; Giridhara Rao, MD
- 1:00 pm **SOAP Golf and Tennis Activities**

Saturday, May 7, 2005

- 7:00 - 8:00 am **Breakfast with the Experts**
Moderator:
Donald H. Penning, MD, MSc, FRCPC
Experts: Jose Carvalho, MD, PhD, FRCPC;
Roshan Fernando, FRCA;
Miriam Harnett, MB, FFARCSI;
David L. Hepner, MD; Ruth Landau, MD;
Kenneth E. Nelson, MD;
Moeen K. Panni, MD, PhD;
May Pian-Smith, MD, MS;
John Sullivan, MD; Lawrence C. Tsen, MD;
Bernard Wittels, MD; David J. Wlody, MD
- 8:15 - 9:15 am **Gerard W. Ostheimer Lecture: What's New in OB Anesthesia?**
Introduction: Lawrence C. Tsen, MD
Brenda A. Bucklin, MD
- 9:15 - 9:45 am **Coffee Break; Posters**
- 9:45 - 10:45 am **Poster Review #2**
Moderator: Linda S. Polley, MD
- 10:45 - 11:45 am **PRO/CON Debate: Is Cell Salvage a Safe Technique for the Obstetric Patient?**
Moderator: Bhavani S. Kodali, MD
Pro: Jonathan H. Waters, MD
Con: Paula J. Santrach, MD
- 11:45 - 1:00 pm **Lunch (On Your Own)**
- 1:00 - 2:00 pm **Poster Case Reports: You did What? The Best Case Reports of the Year!**
Moderator: Scott Segal, MD
- 2:00 - 3:30 **Best Paper Presentations (6)**
Moderator: Geraldine O'Sullivan, MD, FRCA
Judges: David C. Campbell, MD, MSc, FRCPC;
Robert S. McKay, MD; Peter H. Pan, MD;
Cynthia A. Wong, MD; Mark I. Zakowski, MD
- 3:30 - 3:45 **Break (In The Room)**
- 3:45 - 5:00 **Research Hour**
Robert D'Angelo, MD;
Steven Shafer, MD;
Richard M. Smiley, MD, PhD
- 5:00 pm **Meeting Adjourned**
- 6:00 - 11:00 pm **SOAP Banquet**

PRO

CON

In Defense of Ephedrine as the Vasopressor of Choice for Spinal-Anesthesia Induced Hypotension

PRO

Alison MacArthur MD, MSc, FRCPC

(Epidemiology & Biostatistics)

Associate Professor

University of Toronto

Mount Sinai Hospital

For as long as hypotension has been associated with spinal anesthesia, anesthesiologists have evaluated and searched for the ideal vasopressor. Ephedrine has a long history of use, beginning with the fathers of obstetric anesthesia. The Sol Shnider group's basic science investigations, using the sheep model, confirmed the lack of uterine artery vasoconstriction despite its indirect action of releasing norepinephrine.¹ Ephedrine's uterine-artery-sparing effect did not occur with the α_1 agonist methoxamine, or the mixed α/β agents mephentermine and metaraminol, and provided the basis for recommending ephedrine above other vasopressors. Another benefit is that ephedrine is not degraded as the other catecholamines by monoamine oxidase enzymes, and therefore its duration of action can be relied upon beyond the first few minutes following I.V. bolus. Lastly, most anesthesiologists would choose ephedrine for its chronotropic properties when dealing with a patient who is hypotensive and bradycardic. However, critics of ephedrine identify two supposed disadvantages: lack of efficacy and potential for producing fetal harm.

Ephedrine's lack of efficacy became an issue following the publication of comparative clinical studies comparing it to phenylephrine, and a meta-analysis of randomized clinical trials comparing ephedrine to nonpharmacologic therapies.^{2,3,4} The most common study design was a comparison of a prophylactic dose of either vasopressor given with spinal anesthesia to prevent hypotension. In Ngan Kee and Lee's meta-analysis they found a statistical benefit in using ephedrine compared to placebo; however there was still a 32 - 55% incidence of hypotension in the ephedrine group.² In an accompanying editorial, I acknowledged that ephedrine had not solved the problem of spinal hypotension. However I did not advocate the abandonment of ephedrine, but rather an investigation of why ephedrine was ineffective in so many studies. Was an inadequate dose of ephedrine being used?

A search revealed that Lee and Ngan Kee had systematically reviewed the literature to determine the dose response of prophylactic ephedrine.⁵ They identified four randomized clinical trials that evaluated the effectiveness of varying dosages of ephedrine. Following an initial prophylactic dose, further rescue doses or infusions of ephedrine were given. The primary outcome, the development of maternal hypotension, was presented as relative risk, comparing

women who received ephedrine to those who did not at each dose. Maternal hypotension, was defined as a drop in maternal systolic blood pressure 20-30% below baseline. The meta-analysis showed that there was a significant dose-response relationship, with a significantly decreased risk of maternal hypotension with increasing ephedrine dose. The recommended prophylactic dose of ephedrine in balancing the risk of reactive maternal hypertension (defined as increased systolic pressure 20-30% above baseline) against hypotension was a 12 mg I.V. bolus.

If we acknowledge that we commonly administer too little ephedrine, we must also consider the possibility that we usually administer it too late. To illustrate this point I would refer you to a recent article from the phenylephrine literature. Ngan Kee et al. conducted a randomized clinical trial using phenylephrine to maintain women at 80, 90 or 100% of their baseline blood pressure.⁶ Instead of randomizing women to a particular drug, they were randomized to different therapeutic goals, a unique and exciting change to our usual practice of randomized trial therapies. The primary outcome of the study and the basis for sample size calculation was umbilical artery pH. The authors felt that it was important to detect a difference of 0.03 pH units between the three groups. Results of the primary outcome were indeed statistically different. Babies born in the group in which maternal blood pressure was maintained at 100% of the baseline had a mean umbilical artery pH of 7.32 while the mean pH in the group where maternal blood pressure was kept only within 80% of the baseline was reduced to 7.30. It may be that this was not a clinically significant difference, but the hemodynamic stability in the 100% group was reflected in a lower incidence of maternal nausea and vomiting. Unfortunately there are no equivalent studies evaluating ephedrine in the same manner. The four randomized clinical trials, mentioned earlier in Lee and Ngan Kee's meta-analysis,⁵ only tried to maintain maternal blood pressure within 70 - 80% of baseline. To summarize my defense of ephedrine, I would argue that previous studies have utilized inadequate doses, and have not attempted to maintain maternal blood pressure at baseline.

The second problem identified by critics of ephedrine can be best summarized from Dr. Riley's editorial comments accompanying Ngan Kee's phenylephrine study.⁷ Dr. Riley's concern is that ephedrine may put the fetus at risk, because its use has been associated with fetal acidosis. It has been suggested that this is because transplacental passage of ephedrine results in increased fetal metabolic activity. I won't argue with the evidence from observational and randomized trials that have demonstrated a decrease in umbilical artery pH amongst groups receiving ephedrine. I would like to cite a study of Ngan Kee and Lee which attempted to predict important determinants of umbilical artery pH using multivariate regression analysis in a retrospective cohort study.⁸ The final predictive mathematical model from their study stated that the umbilical artery pH after delivery could be estimated based on whether ephedrine was used, what the uterine incision to delivery time is in seconds, the maximum decrease in systolic pressure, and the duration of hypotension. In women receiving ephedrine, there was an additional deleterious effect depending upon the duration of hypotension. Using values from a typical Cesarean delivery under spinal anesthesia, in a woman receiving ephedrine due to a systolic pressure decrease of 40 mm Hg, with a uterine incision to delivery time of 32 seconds, and a duration of

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hypotension of 5 minutes, the resulting umbilical artery pH would be 7.25. What were not included in this mathematical model were factors that have been repeatedly identified with reductions in umbilical artery pH, including length of labor and type of anesthesia. If we are concerned about factors that reduce umbilical artery pH and that we can modify, we should deliver all neonates by cesarean section and under general anesthesia.^{9,10,11}

Presuming that most of the arguments for avoiding ephedrine are based on its effect on umbilical artery pH or umbilical base deficit, we should consider what is an important deleterious pH or base deficit. Should we be concerned when the umbilical artery pH is 7.20, 7.10, or 7.00? The answer to this question may be obtained from the literature on neonatal outcomes. A 1999 consensus paper produced by the American, Canadian and Australian obstetric societies defined the evidence required to indicate that an intrapartum asphyxial event severe enough to cause neonatal neurological injury has occurred.¹² These societies have concluded that fetal metabolic acidosis defined by an umbilical artery pH < 7.00 and base deficit > 12mmol / L is necessary to imply causation of neurologic injury. In most studies describing the effect of specific anesthetic methods, however, reduced umbilical artery pH is typically due to a respiratory acidosis. Numerous pediatric and obstetric papers have demonstrated that respiratory acidosis alone is not identified with newborn complications. As mentioned earlier, the use of ephedrine appears to decrease umbilical artery pH by 0.05 units, presumably due to placental passage and subsequent stimulation of fetal catecholamine release.

If maternal ephedrine increases fetal catecholamines and subsequent metabolic activity, as does labor, could this be beneficial? For example, the incidence of transient tachypnea of the newborn is significantly reduced amongst babies born following a labor compared to babies delivered by elective cesarean section. I discovered an interesting blinded randomized clinical trial evaluating the effectiveness of terbutaline administered to mothers 2 hours prior to elective cesarean delivery.¹³ The authors hypothesized that the beta-adrenergic stimulation of terbutaline would simulate labor and improve respiratory function and glucose homeostasis in the newborn. 25 babies in total were studied, after 13 mothers received terbutaline and 12 received saline placebo. Initial respiratory rates of the babies receiving terbutaline were significantly lower than the placebo babies, and serum glucose levels were maintained over the first two hours at a higher level than placebo babies. Babies of mothers who received terbutaline had significantly lower airway resistance and higher lung compliance than controls. Only the cord blood base deficit was significantly higher for the treatment group, with a BE of -5.2 compared to -2.7 for the control group. Two babies of the control group were diagnosed with TTN.

So to conclude my defense against the statement that ephedrine causes fetal harm, I submit that the reduction in umbilical artery pH associated with ephedrine use is statistically but not clinically significant. Further, there are situations in which the increased fetal metabolic activity produced by ephedrine may be useful. As Dr. Riley has noted, "we should be more aggressive about maintaining arterial

pressure near normal, and we should worry less about the liberal use of other vaso-constricting drugs."⁷

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Ephedrine in Obstetrics? The Clinical Data Say No!

CON

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Introduction

The story of the use of ephedrine in obstetric anesthesia is a perfect example of why clinical research is necessary even when the laboratory and animal data clearly demonstrate a drug's superiority. In the case of ephedrine in obstetrics, there is overwhelming animal evidence that it is safer for the fetus than any other pressor and there is even laboratory data that describes a mechanism for why this would be the case. The problem is that there is no clinical evidence that ephedrine is actually superior to other pressors in obstetrics. In fact, there is plenty of clinical data that suggests the opposite; ephedrine may be harmful for the fetus.

Historical Review

The first line of evidence that came out that suggested that ephedrine should be the drug of choice for treating hypotension in obstetric anesthesia comes from the many sheep studies that have been carried out in a number of different laboratories.^{1,2} These studies studied chronically instrumented pregnant ewes in which it was possible to measure uterine artery blood flow and fetal and maternal arterial pH. The studies found that when ephedrine was used to maintain or raise blood pressure, uterine blood flow and fetal pH were maintained. Other pressors (e.g. metaraminol or phenylephrine) tended to decrease fetal pH and uterine blood flow.

Evidence from James Eisenach's lab demonstrated why this was true.^{3,4} In one experiment, they found that:

1. Both ephedrine and metaraminol caused less vasoconstriction of uterine artery samples from pregnant ewes compared to non-pregnant ewes.
2. The exact opposite was true for femoral artery samples. The pressors had a greater effect on the samples from non-pregnant ewes.
3. This means that in pregnant animals, the pressors constricted the femoral artery to a much greater degree compared to the uterine artery. This would tend to enhance uterine blood flow.
4. The difference between the pressors was that the ratio of maximal effect of the drugs in the femoral artery compared to the uterine artery in pregnant animals was 5 for ephedrine and 2 for metaraminol. This means ephedrine will enhance uterine blood flow to an even greater degree than metaraminol.

In another experiment from Eisenach's lab, they found that nitric oxide synthase (NOS) was up regulated in the uterine artery during pregnancy. The elevated levels of NOS decrease uterine artery responsiveness to pressors that cause vasoconstriction. In addition, they found that ephedrine causes the release of NOS. This causes the uterine artery to constrict even less in the presence of ephedrine compared to other pressors.

In summary, animal and lab data clearly demonstrate that ephedrine preserved uterine artery blood flow and fetal pH to a much better degree than other pressors. From this clinicians concluded that ephedrine was the drug of choice to restore blood pressure in pregnant women.

Umbilical Cord Gas Data

Unfortunately, when we look at how ephedrine performs when used for restoring blood pressure in pregnant women having spinal anesthesia, the data are disappointing. The most relevant clinical outcome in these studies is the umbilical artery pH. This value tells us how well oxygen was delivered and utilized in the fetus just prior to birth. In no study comparing ephedrine with phenylephrine has the ephedrine group had a higher umbilical pH than the phenylephrine group. In a meta-analysis by Lee et al, they found that on average, the umbilical artery pH was 0.03 higher in the women who received phenylephrine rather than ephedrine.⁵ This difference is small, but the data suggest that phenylephrine is the better drug to use in this circumstance.

This pattern is consistent for other pressors as well. In another meta-analysis, Halpern's group in Toronto found that any pressor or pressor combination out performed pure ephedrine (data presented at the 2002 SOAP meeting but not yet published). Again, no study ever found ephedrine to be the better drug.

More evidence that ephedrine is not a good drug to use in obstetrics comes from studies that use ephedrine to prevent, rather than treat, hypotension. In all these studies, the authors have found that low doses of ephedrine do not effectively prevent hypotension and that higher doses cause significant acidosis in the neonate.⁶⁻⁸

Metabolic Acidosis

Some experts feel that umbilical artery pH is not a useful outcome measure. A respiratory acidosis in the umbilical cord gas is not predictive of adverse neurological outcomes. However, a metabolic acidosis is predictive of adverse neurologic outcomes. In a recent multivariate analysis of a large data set Ngan Kee et al, found an association between ephedrine use and a metabolic acidosis in the umbilical artery.⁹ Although the degree of acidosis did not amount to clinically significant levels, this is a worrisome trend in a population of healthy mothers with normal pregnancies having cesarean deliveries.

Why Does Ephedrine Cause More Umbilical Artery Acidosis?

If ephedrine improves blood flow to the uterus and increases fetal pH in sheep, why is it associated with greater acidosis in the human fetus? I believe the most likely explanation is that ephedrine increases the metabolic rate in the fetus. A study by Cooper et al. offers evidence that this may be the case.¹⁰ They used an index to assess where the umbilical artery acidosis was occurring. They took the pCO₂ of the umbilical artery and subtracted the pCO₂ of the umbilical vein. They assumed that if this value was large, then the acidosis was being generated in the fetus. What they found was that a low umbilical artery pH was strongly correlated with a high umbilical artery pCO₂ minus umbilical vein pCO₂ in the ephedrine group. They also found that this index was correlated with ephedrine dose. These data are highly suggestive that ephedrine is increasing the metabolic rate of the fetus.

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The Early Fetal Heart Rate Study

One of the strongest data sets available that ephedrine may be harmful to the fetus comes from Sol Shnider's group. The paper was published in 1981.¹¹ They studied laboring women who received epidural analgesia and ephedrine to prevent or treat hypotension. They found that ephedrine increased the fetal heart rate to tachycardic levels or caused a decrease in variability in over half the patients. Both of these findings were clear signs of fetal distress. Despite this evidence, they assumed that the ephedrine was causing a clinically insignificant change in the fetal heart rate pattern. They assumed that the observed changes were benign because of the wealth of animal data suggesting that ephedrine was the best drug to use in this circumstance.

Why Are The Laboratory/Animal Data Different Than The Clinical Data?

Why do the results from these animal studies differ from the clinical studies in humans? Three possible answers to this question:

1. Human vasculature and placental blood flow are different than what is found in sheep.
2. Maybe ephedrine increases the metabolic rate of humans to a greater degree than it does in sheep. Therefore, the beta-agonist stimulation of the metabolic rate seen in humans is not seen in sheep.
3. Maybe the stress of birth unmasked the stress imposed by ephedrine. In the instrumented sheep model, the drugs are given when the animal was not stressed and this might be why the metabolic rate was unaffected. In humans, the ephedrine was given during labor and delivery or during cesarean delivery. The combination of this stress with the ephedrine increased the fetal metabolic rate.

Clinical Significance

Some experts will say that these minor differences in cord gases and fetal heart rate strips are not clinically significant and that since blood flow is better preserved with ephedrine, that it should remain the drug of choice. However, it is important to remember that these studies were done on perfectly healthy patients having elective cesarean deliveries or in the case of the fetal heart rate study, vaginal deliveries. These patients and their babies are going to do well even if they get a drug that puts greater stress on the fetus. However, the increased acidosis we see with ephedrine is a sign of a net decrease in the oxygen delivery to the fetus (net delivery being the oxygen delivered minus what is used). It does not matter whether there is increased blood flow with ephedrine, what counts is oxygen delivery and utilization and the net sum of oxygen to the fetus is decreased in the presence of ephedrine. When there is fetal distress or a maternal hemorrhage decreases uterine perfusion, giving a drug that will either decrease oxygen delivery or increase oxygen utilization makes no sense. Better to choose a pressor like phenylephrine to treat the blood pressure.

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