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Journal Symposium at the Japanese Society of Anesthesiologists Annual Meeting

Outcomes Beyond the Operating Room

Daniel I. Sessler, M.D.,* Makoto Ozaki, M.D.†

The Japanese Society of Anesthesiologists and ANESTHESIOLOGY announce the first Japanese Society of Anesthesiologists-ANESTHESIOLOGY Symposium to be held at the 57th Annual Meeting of Japanese Society of Anesthesiologists on June 4, 2010, Fukuoka, Japan.

Fukuoka city lies on the northern coast of Kyushu Island, which is the southwestern part of Japan, about 900 km from Tokyo. Being the closest major Japanese city to the Korean Peninsula and China, Fukuoka has traditionally been a gateway for economic and cultural exchanges with its Asian neighbors. The city is vibrant and attractive, as well as rich in history and nature. Fukuoka is connected with major Asian continents by direct flights, which will facilitate travel for delegates from the Americas, Europe, and Oceania.

This Japanese Society of Anesthesiologists-ANESTHESIOLOGY Symposium, conducted in English, will highlight emerging and important concepts in anesthesia research and clinical practice. In this respect, it will be analogous to the ANESTHESIOLOGY Journal Symposium held each year in conjunction with the American Society of Anesthesiologists Annual Meeting.

This year's topic is Outcomes Beyond the Operating Room. Although preventable anesthetic mortality is fortunately rare, all-cause postoperative mortality is surprisingly high. Approximately 5% of all surgical patients die in the year after surgery; among those older than 65 yr, mortality is approximately 10%.[1] Or to put another way, mortality in the year after surgery is approximately 10,000 times greater than preventable anesthetic mortality.

Given that modern anesthetic drugs are uniformly short-acting, it is by no means obvious that consequences of anesthetic management could last more than hours or days after surgery. But it is reasonable to at least consider whether anesthetic management might influence long-term outcomes, which are outcomes that become apparent weeks, months, or even years after surgery.

There is, in fact, increasing evidence that anesthetic management may have long-term consequences. To the extent that it does, modulating anesthetic management to improve long-term outcomes is an enormous opportunity for the specialty. Potential long-term consequences of anesthetic management include the following:

- Maintaining normothermia[2,3] and possibly supplemental oxygen[4–6] to reduce the risk of surgical wound infection.
- Use of regional analgesia to reduce the risk of cancer recurrence after potentially curative surgery.[7–9]
- Infection and mortality after autologous erythrocyte transfusions,[10,11] especially transfusions of blood stored for more than 2 weeks.[12]
- The effects of hemodynamic control, especially with β blockers, on perioperative myocardial infarction and stroke.[13,14]
- Potential reduction in complications and mortality from tight control of perioperative glucose concentration, especially in critical care patients.[15,16]
- Guided fluid management to reduce complications of major surgery.[17,18]
- Postoperative cognitive dysfunction[19,20] and the potential effects of volatile anesthetics on cognitive development in neonates.[21,22]

Two keynote talks will anchor the Journal Symposium. These talks will provide a framework for subsequent presentation of abstracts and discussion. The speakers will be

- Daniel I. Sessler, M.D., Professor and Chair of the Department of Outcomes Research at The Cleveland Clinic: "Hospital Stay and mortality are increased by a 'Triple

* Professor and Chair, Department of OUTCOMES RESEARCH, The Cleveland Clinic, Cleveland, Ohio. † Professor and Chair, Department of Anesthesiology, Tokyo Women's Medical University, Tokyo, Japan.

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Address correspondence to Dr. Sessler: Department of OUTCOMES RESEARCH, The Cleveland Clinic, 9500 Euclid Avenue, P-77, Cleveland, Ohio 44195. ds@or.org.

Low' of blood pressure, bispectral index, and anesthetic level."

- Moritoki Egi, M.D., Clinical Instructor, Department of Anesthesiology and Resuscitology, Okayama University Hospital, Okayama, Japan: "Launching into the postoperative period."

Topical abstracts will be presented as posters, but in addition, four abstracts have been accepted for oral presentation at the symposium; these authors will be offered an opportunity to submit their work to ANESTHESIOLOGY for inclusion in the special symposium issue to be published in 2011. The featured abstracts are as follows:

Low molecular weight hydroxyethyl starch administration is not related to postoperative acute kidney injury: Arata Endo, M.D., Department of Anesthesiology, Jikei University School of Medicine, Tokyo, Japan

The investigators tested the hypothesis that low-molecular weight hydroxyethyl starch does not augment the risk of perioperative renal injury. They conducted a retrospective analysis using both logistic regression and propensity score analyses in patients having intraoperative blood loss exceeding 1,000 ml. The primary outcome was a 50% increase in serum creatinine within 7 postoperative days. Approximately 13% of patients who were or were not given low-molecular light hydroxyethyl starch experienced a 50% increase in creatinine. They conclude that this fluid does not provoke renal injury.

Role of calcium dysregulation and mitochondrial permeability transition for neuronal toxicity after general anesthesia: Hiroyuki Uchino, M.D., Department of Anesthesiology, Tokyo Medical University, Tokyo, Japan

A potential mechanism for volatile anesthetic toxicity is rapid calcium-triggered permeabilization of the inner membrane, so-called mitochondrial permeability transition mediated by concerted action of several important mitochondrial proteins, for example, the adenine nucleotide transporter and the isomerase cyclophilin-D. They present evidence supporting the existence of mitochondrial permeability transition in brain-derived human mitochondria. Sevoflurane, but not isoflurane, increased intracellular calcium in hippocampal slices cultured after 60 min of exposure.

Polymorphism of angiotensin-converting enzyme seriously affects clinical outcome after cardiac valve surgery: Keisuke Nakazawa, M.D., Department of Anesthesiology, Tokyo Women's Medical University, Tokyo, Japan

The investigators tested the hypothesis that differences in insertion or deletion polymorphism of the angiotensin-converting enzyme are associated with clinical outcomes after cardiac valve surgery. Gel electrophoresis and polymerase chain reaction were used to detect polymorphisms in 110 patients. Postoperative blood loss was greater in patients who were not homozygous for insertion genotypes ($P < 0.05$). Postoperative infections and blood transfusion were more common in these patients, and the duration of the intensive care unit stay and mechanical ventilation was significantly longer. Patients with deletion alleles have more serious events than those with insertion genotypes.

Impact of the introduction of remifentanil on postoperative outcome in patients undergoing general anesthesia: Kanji Uchida, M.D., Tokyo University, Tokyo, Japan

Remifentanil is an ultrashort-acting opioid that might shorten the duration of hospitalization. The investigators evaluated the duration of hospitalization before and after introduction of remifentanil into routine practice in Japan. Analysis was restricted to 423,491 patients having eight procedures in which remifentanil was likely to prove beneficial. The duration of hospitalization decreased slightly during the study period; however, total in-hospital medical costs were comparable.

References

1. Monk TG, Saini V, Weldon BC, Sigl JC: Anesthetic management and one-year mortality after noncardiac surgery. Anesth Analg 2005; 100:4–10
2. Kurz A, Sessler DI, Lenhardt RA: Study of wound infections and temperature group: Perioperative normothermia to reduce the incidence of surgical-wound infection and shorten hospitalization. N Engl J Med 1996; 334:1209–15
3. Melling AC, Ali B, Scott EM, Leaper DJ: Effects of preoperative warming on the incidence of wound infection after clean surgery: A randomised controlled trial. Lancet 2001; 358:876–80
4. Greif R, Akça O, Horn E-P, Kurz A, Sessler DI, Outcomes Research™ Group: Supplemental perioperative oxygen to reduce the incidence of surgical wound infection. N Engl J Med 2000; 342:161–7
5. Belda FJ, Aguilera L, Garcia de la Asuncion J, Alberti J, Vicente R, Ferrandiz L, Rodriguez R, Company R, Sessler DI, Aguilar G, Botello SG, Orti R: Supplemental perioperative oxygen and the risk of surgical wound infection: A randomized controlled trial. JAMA 2005; 294:2035–42
6. Meyhoff CS, Wetterslev J, Jorgensen LN, Henneberg SW, Hogdall C, Lundvall L, Svendsen PE, Mollerup H, Lunn TH, Simonsen I, Martinsen KR, Pulawska T, Bundgaard L, Bugge L, Hansen EG, Riber C, Gocht-Jensen P, Walker LR, Bendtsen A, Johansson G, Skovgaard N, Helto K, Poukinski A, Korshin A, Walli A, Bulut M, Carlsson PS, Rodt SA, Lundbech LB, Rask H, Buch N, Perdawid SK, Reza J, Jensen KV, Carlsen CG, Jensen FS, Rasmussen LS: Effect of high perioperative oxygen fraction on surgical site infection and pulmonary complications after abdominal surgery: The PROXI randomized clinical trial. JAMA 2009; 302: 1543–50
7. Sessler DI: Does regional analgesia reduce the risk of cancer recurrence? A hypothesis. Eur J Cancer Prev 2008; 17:269–72
8. Biki B, Mascha E, Moriarty DC, Fitzpatrick JM, Sessler DI, Buggy DJ: Anesthetic technique for radical prostatectomy surgery affects cancer recurrence: A retrospective analysis. ANESTHESIOLOGY 2008; 109:180–7
9. Exadaktylos AK, Buggy DJ, Moriarty DC, Mascha E, Sessler DI: Can anesthetic technique for primary breast cancer surgery affect recurrence or metastasis? ANESTHESIOLOGY 2006; 4:660–4
10. Marik PE, Corwin HL: Efficacy of red blood cell transfusion in the critically ill: A systematic review of the literature. Crit Care Med 2008; 36:2667–74
11. Hill GE, Frawley WH, Griffith KE, Forestner JE, Minei JP: Allogeneic blood transfusion increases the risk of postoperative bacterial infection: A meta-analysis. J Trauma 2003; 54:908–14

12. Koch CG, Li L, Sessler DI, Figueroa P, Hoeltge GA, Mihaljevic T, Blackstone EH: Duration of red-cell storage and complications after cardiac surgery. N Engl J Med 2008; 358:1229–39
13. Mangano DT, Layug EL, Wallace A, Tateo I: Effect of atenolol on mortality and cardiovascular morbidity after noncardiac surgery. Multicenter Study of Perioperative Ischemia Research Group. N Engl J Med 1996; 335:1713–20
14. Devereaux PJ, Yang H, Yusuf S, Guyatt G, Leslie K, Villar JC, Xavier D, Chrolavicius S, Greenspan L, Pogue J, Pais P, Liu L, Xu S, Malaga G, Avezum A, Chan M, Montori VM, Jacka M, Choi P: Effects of extended-release metoprolol succinate in patients undergoing non-cardiac surgery (POISE trial): A randomised controlled trial. Lancet 2008; 371:1839–47
15. van den Berghe G, Wouters P, Weekers F, Verwaest C, Bruyninckx F, Schetz M, Vlasselaers D, Ferdinande P, Lauwers P, Bouillon R: Intensive insulin therapy in the surgical intensive care unit. N Engl J Med 2001; 345:1359–67
16. Finfer S, Chittock DR, Su SY, Blair D, Foster D, Dhingra V, Bellomo R, Cook D, Dodek P, Henderson WR, Hebert PC, Heritier S, Heyland DK, McArthur C, McDonald E, Mitchell I, Myburgh JA, Norton R, Potter J, Robinson BG, Ronco JJ: Intensive *versus* conventional glucose control in critically ill patients. N Engl J Med 2009; 360:1283–97
17. Wakeling HG, McFall MR, Jenkins CS, Woods WG, Miles WF, Barclay GR, Fleming SC: Intraoperative oesophageal Doppler guided fluid management shortens postoperative hospital stay after major bowel surgery. Br J Anaesth 2005; 95:634–42
18. Noblett SE, Snowden CP, Shenton BK, Horgan AF: Randomized clinical trial assessing the effect of Doppler-optimized fluid management on outcome after elective colorectal resection. Br J Surg 2006; 93:1069–76
19. Newman S, Stygall J, Hirani S, Shaefi S, Maze M: Postoperative cognitive dysfunction after noncardiac surgery: A systematic review. ANESTHESIOLOGY 2007; 106:572–90
20. Rasmussen LS, Johnson T, Kuipers HM, Kristensen D, Siersma VD, Vila P, Jolles J, Papaioannou A, Abildstrom H, Silverstein JH, Bonal JA, Raeder J, Nielsen IK, Korttila K, Munoz L, Dodds C, Hanning CD, Moller JT: Does anaesthesia cause postoperative cognitive dysfunction? A randomised study of regional *versus* general anaesthesia in 438 elderly patients. Acta Anaesthesiol Scand 2003; 47: 260–6
21. Patel P, Sun L: Update on neonatal anesthetic neurotoxicity: Insight into molecular mechanisms and relevance to humans (editorial). ANESTHESIOLOGY 2009; 110:703–8
22. Perouansky M, Hemmings HC Jr: Between Clotho and Lachesis: How isoflurane seals neuronal fate (editorial). ANESTHESIOLOGY 2009; 110:709–11