

REPORT OF SCIENTIFIC MEETING

James C. Eisenach, M.D., Editor

Society of Neurosurgical Anesthesia and Critical Care: Annual Meeting Report. Dallas, Texas, October 8, 1999.

This year's program was organized by Christian Werner, M.D., and had an attendance of 211. The sessions were composed of lectures on basic science, clinical monitoring, and pro/con debates on controversial issues in neurosurgical anesthesia and critical care. Abstracts of the scientific papers are published in the *Journal of Neurosurgical Anesthesiology* 1999; 11:306–36.

Featured Lecture

Walter Zieglgänsberger, M.D., from the Max-Planck-Institute für Psychiatrie, initiated the proceedings with a lecture on "The Glutamate Cascade in Anaesthesia." After an overview of glutamate activation of ionotropic and metabotropic receptors, Dr. Zieglgänsberger elaborated on the actions of glutamate in the developing nervous system and its interplay between neuronal networks. He also detailed potential molecular targets of general anesthetics, which likely include transporters and elements of presynaptic release mechanisms as well as metabolic enzymes and modulatory molecules, in addition to various presynaptic and postsynaptic receptors that might either enhance neuronal inhibition or attenuate neuronal excitation.

Clinical Review and Debate

Tod Sloan, M.D., Ph.D., presented a clinical review on electrophysiologic monitoring in which he delineated the potential functions of such monitoring but emphasized that, at present, monitoring of somatosensory evoked potentials during scoliosis surgery and the facial nerve during surgery for acoustic neuroma are the only modalities that should be considered standard of care.

The afternoon session featured two lively pro/con sessions. The first debate was on the management of cerebral perfusion pressure in head-injured patients. John Drummond, M.D., was a proponent of maintaining cerebral perfusion pressure > 70 mmHg to minimize cerebral ischemia. He cited several studies that demonstrated poor neurologic outcome in hypotensive head-injured patients. Bengt Nelligard, M.D., Ph.D., argued for the "Lund Concept," which counters hypoperfusion by reducing intravascular hydrostatic pressure and hence transcapillary filtration and brain edema.

The second debate was on induced hypothermia in neurosurgical patients. Adrian Gelb, M.D., was the protagonist and cited several studies supporting the neuroprotective effect of hypothermia in experimental models. Evidence from human trials are still forthcoming, but pilot studies in head trauma and subarachnoid hemorrhage show promising results. Steven Frank, M.D., the antagonist, argued that the "jury is still out" on the clinical efficacy of routine hypothermia in neurosurgical cases. Citing the deficiencies of clinical trials, he questioned the validity of long-term outcomes in patients treated with hypothermia. He was concerned that the risks of hypothermia, e.g., infections, cardiac morbidity, and coagulopathies, do not justify the long-term benefit. The issue was discussed, and many viewpoints were considered, with a consensus that a multicenter study with a large enrollment and clear outcome variables is mandated.

Oral Abstract Presentations

The recipient of the Society of Neurosurgical Anesthesia and Critical Care Young Investigator Award was Lisa Faberowski, M.D., from the University of Florida, for her work entitled, "Hypoxia- and Ischemia-induced Neuronal Apoptosis is Decreased by Desflurane and Sevoflurane." She reported that neurons pretreated with either desflurane or sevoflurane are resistant to apoptosis after exposure to hypoxia. Her findings suggest that a neuroprotective effect of volatile anesthetics may be caused by inhibition of apoptotic cell death. Other highlights of oral presentations included the following:

- C. De Deyne, M.D., discussed the combined use of jugular oximetry and bispectral index (BIS) for monitoring cerebral perfusion during cerebral aneurysm clipping and provided several clinical scenarios in which changes in cerebral oxygenation were detected.
- L. Faberowski, M.D., reported that the incidence of venous air embolism was 82.6% in 23 infants undergoing craniectomies.

Poster Presentations

Thematic highlights of the 107 poster presentations are summarized as follows:

Cerebral Blood Flow:

- O. Möllenburg, M.D., compared the effect of S^+ ketamine/propofol to sevoflurane. Sevoflurane impaired cerebrovascular autoregulation, whereas the intravenous agents maintained this variable.
- W. Wendling, M.D., reported that the noncompetitive *N*-methyl-D-aspartate receptor antagonists, phencyclidine and dizocilpine, constricted cerebral arteries by potassium channel inhibition.
- J. Marota, Ph.D., M.D., studied the relationship between cerebral blood volume and cerebral blood flow in brain tumors and found that both parameters were elevated, but their ratio was unchanged.

Ischemia/Protection:

- I. Kass, Ph.D., examined the effect of hypothermia in isolated hippocampal slices and reported that posthypoxia hypothermia improved electrophysiologic recovery.
- J. Wilson, Ph.D., reported that hypothermia and propofol decrease oxidative injury to astroglial glutamate transport systems and result in increased glutamate reuptake by astrocytes.
- I. Santos, M.D., evaluated the utility of induced hypothermia by forced air cooling for patients undergoing elective craniotomies. This modality was more efficient than passive cooling but was associated with a greater incidence of postoperative hyperthermia and infections.
- F. Sieber, M.D., reported larger infarction size after temporary focal ischemia in diabetic rats and demonstrated that this injury may be caused by increased protein kinase C activity and decreased Na^+ - K^+ -adenosine triphosphatase activity in cerebral vessels.
- W. S. Jellish, M.D., Ph.D., reported that hyperglycemia increased glutamate and aspartate levels during global ischemia in rats and that clonidine attenuated the release of these excitatory amino acids.
- A. Baker, M.D., reported that hyperglycemia improved functional recovery of brain white matter after anoxia.
- M. Kawaguchi, M.D., demonstrated that, although isoflurane decreased infarct volume 2 days after transient focal ischemia in rats, isoflurane did not significantly reduce infarction volume but de-

creased selective neuronal necrosis in the peri-infarct area 14 days later.

- B. Nellgard, M.D., Ph.D., reported that preischemic depletion of brain norepinephrine decreased infarct size in a rodent stroke model and hypothesized that, because volatile agents attenuate the central stress response, reduction of brain norepinephrine may be a mechanism for neuroprotection of volatile anesthetics.
- Y. Shapira, M.D., Ph.D., found that a bradykinin antagonist reduced cerebral edema in a rodent model of closed head injury.
- J. Kirsch, M.D., reported that hypertonic saline increased infarct volume and tissue swelling when compared with normal saline in a rodent model of stroke.
- M. Mirski, M.D., demonstrated that hypertonic saline was more effective than mannitol in reducing intracranial pressure after acute cryogenic brain injury in rats.

Clinical Neurologic Science:

- W. S. Jellish, M.D., Ph.D., reported that the incidence of peripheral nerve injury and postoperative complications was greater in lateral approaches to the skull base than the occipital approach.
- E. Eldredge, M.D., underscored the importance of compatible equipment suitable for pediatric patients in anesthetizing patients for craniotomies performed in the magnetic resonance unit.
- P. Schupfer, M.D., evaluated the effect of cervical traction during direct laryngoscopy and tracheal intubation in normal patients and noted that intervertebral angles decreased in segments above C4 but increased between C4 and C5. This study questions the safety of cervical traction on the stability of the C4-C5 segment in patients with cervical spine pathology.

Monitoring:

- A. Kumar, M.D., was not able to find a correlation between clinical indices of anesthetic depth and BIS values.
- L. Sels, M.D., reported the use of the BIS monitor for sedation of patients in the intensive care unit and concluded that the BIS provides a useful end point and may prevent oversedation.
- N. Forster, M.D., using BIS values as an end point, reported that rapid administration of propofol increased the hypnotic effect.
- D. Rusy, M.D., using a propofol/opioid/N₂O anesthetic, reported the utility of using somatosensory evoked potentials, lower-extremity and anal sphincter electromyography, and bladder manometry in guiding surgical tethered cord release.
- S. Black, M.D., in a review of 1,123 spine surgery cases, reported that somatosensory evoked potentials detected changes that resulted in a modification of the surgery or position.
- S. Samra, M.D., evaluated the utility of cerebral oximetry in predicting cerebral ischemia for patients undergoing carotid endarterectomy. This modality has a low false-negative but a high false-positive rate.

The business meeting was held during the lunch hour, at which time the officers were elected and other vacancies filled. The annual meeting of the Society of Neurosurgical Anesthesia and Critical Care will reconvene on Friday, October 13, 2000, in San Francisco, California.

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