Look for Neurologic Complications of Anesthesia

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ASHEVILLE, N.C. — Though very rare, severe neurologic complications can occur as a result of spinal and epidural blocks for labor and delivery, and keeping an eye out for early symptoms can result in better outcomes, according to one expert.

Spinal hematoma, cauda equina syndrome, bacterial meningitis, and epidural abscess appear to be the most common severe neurologic complications, based on a study of 1,260,000 spinal blocks and 450,000 epidural blocks administered in Sweden between 1990 and 1999, said David C. Mayer, M.D., professor of anesthesiology at the University of North Carolina in Chapel Hill.

Complications occurred more often after placement of epidurals than spinal blocks. The study included 200,000 epidurals for pain relief during labor and 55,000 spinal blocks and epidurals for cesarean sections (Anesthesiology 2004;101:950-9).

Altered coagulation with catheter insertion or removal can lead to hematoma. So removing the catheter can be as traumatic as placing it.

"Spinal hematoma has a uniformly bad outcome," Dr. Mayer said at the Southern Obstetric and Gynecologic seminar. In the study, 27 of the 33 spinal hematoma cases resulted in permanent neurologic damage.

Spinal or epidural hematoma is primarily associated with catheter technique. An indwelling catheter in the epidural space almost always is associated with epidural hematoma. Several other factors can come into play, including spine pathology, difficulty in performing the block, and altered coagulation.

With spine pathology, there may be an abnormal nerve route that increases the likelihood of hitting a blood vessel. Difficult blocks involve multiple sticks and increase the risk of hitting a blood vessel. Altered coagulation combined with catheter insertion or removal can lead to hematoma. "Removing an epidural catheter can be as traumatic as placing it," Dr. Mayer said.

The key problem associated with epidural hematoma is the diagnosis. Back pain was considered the classic symptom of epidural hematoma, but motor block that does not resolve is now considered a better indicator. Consult an anesthesiologist and neurosurgeon right away if a patient has motor block that persists, is out of proportion for the pain medication given, or develops several days later.

According to a closed claims database that is maintained by the American Society of Anesthesiologists, 90% of neuraxial hematomas result in irreversible damage. Unfortunately, the diagnosis is made well after the onset of symptoms. There's only an 8-hour window between the onset of neurologic changes and laminectomy—the treatment of choice—to avoid any permanent damage. "For many patients, by the time they're evaluated completely, it's past the period in which anything can be done," Dr. Mayer said.

Anticoagulation medication is now so common among patients receiving anesthesia that the American Society of Regional Anesthesia and Pain Medicine has developed a consensus statement on the use of regional anesthesia in anticoagulated patients (Reg. Anesth. Pain Med. 2003;28:172-97).

According to this guideline, there is no increased risk of hematoma when unfractionated heparin is used for subcutaneous prophylaxis. If the patient has been on this therapy for more than 4 days at the time of epidural placement, a platelet count is needed to rule out heparin-induced thrombocytopenia.

Low molecular weight heparins (LMWHs) are a different matter. LMWHs "have really changed how we give regional anesthesia in the anticoagulated patients," said Dr. Mayer. If patients are on an LMWH before the epidural is placed, assume that the patient has altered coagulation. Delay needle placement by at least 10-12 hours after giving a dose of LMWH. However, in patients receiving higher doses—for example, 1 mg/kg enoxaparin every 12 hours—delay the epidural for at least 24 hours. "These patients have very abnormal coagulation,"

Dr. Mayer said.

Cauda equina syndrome occurred nearly as often as spinal hematoma in the Swedish study but had worse outcomes, with all 32 cases resulting in permanent neurologic damage.

Cauda equina syndrome is characterized by lower extremity weakness or paralysis, bowel or bladder sphincter dysfunction, and saddle anesthesia.

The onset of symptoms can range from a couple of days to a couple of weeks. "It's a very insidious onset. … Once you get these findings, there's actually nothing that can be done, other than rehabilitation," said Dr. Mayer, who is also a professor of obstetrics and gynecology at the university.

Cauda equina syndrome can be caused by massive disk herniation and compression of nerves. There have been case reports and small series of cases that implicate the use of hyperbaric lidocaine—potentially because of the preservative used or possibly even because of the lidocaine itself. "This is unclear, but a lot of anesthesiologists are hesitant to use any intrathecal lidocaine because of the risk of cauda equina syndrome," Dr. Mayer said.

Preexisting spinal stenoses also appear to be associated with this syndrome. Spinal stenoses narrow the space in the spinal canal and impede the flow of the epidural, resulting in increased pressure on the nerves. If the patient is older and has vascular disease, ischemia can lead to cauda equina syndrome.

Infectious complications, such as bacterial meningitis and epidural abscess, have the most favorable outcomes, with most patients in the Swedish study making a full recovery.

The best medical outcomes rely on early diagnosis. Fever and backache are clearly the most common symptoms, although neurologic changes may be present as well.

Typically, it takes about 5 days for onset of symptoms. *Staphylococcus* species are the most commonly identified culprits. And treatment may include antibiotic therapy or even surgery to decompress the spinal cord.

Meningitis is exclusively related to spinal blocks and results from puncture of the dura. Typically, meningitis manifests within 24 hours as headache or neurologic changes.

"Early infectious processes are more likely to be meningitis than epidural abscesses," Dr. Mayer said. In the Swedish study, streptococci were responsible for most of the meningitis cases. ■