

A Terrible Headache in Obstetric Anesthesia

WHEN an obstetrical anesthesiologist makes postpartum rounds, the first things they ask the patient after “How are you?” is, “Do you have a headache?” This direct approach results from the fact that neuraxial block is used for most obstetrical anesthetics, and the incidence of postdural puncture headache is approximately 1%, regardless of whether a spinal or epidural technique was performed.¹ Clearly there are many reasons to have a headache after childbirth, and headaches are quite common, approximately 30% in postpartum women, whether or not neuraxial blockade was performed.² Most postpartum headaches are benign and self-limited, resulting from lack of sleep or caffeine withdrawal. However, the postpartum period is associated with increased

risk of serious neurologic complications that may manifest first as headaches. In this issue of *ANESTHESIOLOGY*, Bateman *et al.* have used data from the Nationwide Inpatient Sample to investigate the epidemiology of subarachnoid hemorrhage in the peripartum period.³ The authors identified about 640 hospital discharges with pregnancy-related subarachnoid hemorrhage that were recorded in the Nationwide Inpatient Sample between 1995–2008, and compared demographic and medical characteristics against pregnant and nonpregnant age- and gender-matched controls. They also evaluated clinical factors associated with subarachnoid hemorrhage in pregnancy that occurred in their institution between 1992–2010.

The authors found an incidence of postpartum subarachnoid hemorrhage of 5.8 in 100,000 deliveries, more than half of which occurred after delivery. This complication accounted for more than 4% of in-hospital postpartum deaths. Risk factors were older age, African-American or Hispanic heritage, sickle cell disease, hypertensive diseases of pregnancy, smoking, and coagulopathy. The etiology of the subarachnoid hemorrhage was less likely to be related to intracranial aneurysm than in women who were not pregnant. Subarachnoid hemorrhage in pregnancy had a better prognosis than in



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nonpregnant controls, likely as a result of the younger, otherwise healthy population and a lower risk of aneurysmal etiology. The risk factors for subarachnoid hemorrhage in the peripartum period are all known risk factors for vascular disease, except coagulopathy, which is clearly a risk factor for bleeding. Pregnancy has recently been considered a “stress test” that can unmask the tendency toward underlying chronic disease that normally occurs later in life. This has been clearly documented for diabetes and hypertension. These risk factors are similar to those found previously by Bateman for all intracerebral hemorrhage⁴ in pregnancy and subarachnoid hemorrhage in the general population.⁵ It may be that the increases in plasma volume that occur in normal pregnancy, increases in vascular tone that occur in hypertensive diseases of pregnancy, and hypercoagulability combined with the elevation in catecholamines that occur during delivery create the perfect storm to unmask underlying cerebrovascular disease. This hypothesis is supported by the authors’ own institutional experience. They described 12 cases of subarachnoid hemorrhage complicating pregnancy that occurred in their institution, four of which had underlying aneurysms or arteriovenous malformations and two of which were associated with venous sinus thrombosis.

A large database like the Nationwide Inpatient Sample provides the power necessary to investigate risk factors for rare medical conditions. However, it consists of administrative data collected for billing purposes, and as such cannot offer the richness of a clinical database and does not allow for longitudinal follow-up. Combining such a study with local data allows for more in depth analysis of patient characteristics and evaluation of outcome. The authors made use of standard techniques in regression to build a parsimonious model that describes their findings. However, this can be challenging when investigating multiple variables that are expected to be highly correlated, such as hypertension and African-American or Hispanic heritage. That the unit of

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analysis in this study is hospital discharges rather than individual patients is of particular concern because a large proportion of these hospital discharges may have resulted from repeat admissions and interhospital transfers, as indicated in the data from the authors' institution that 6 of 12 pregnancy-related subarachnoid hemorrhage cases were transferred from other hospitals. Thus, the validity and reliability of the study results may have been compromised to some degree by the reliance on weighted data and the lack of consideration of sampling error in the weighted data. The effective sample size of the study is likely substantially smaller than the weighted estimates because of duplicate discharges for some patients. The inability to identify individual patients and follow them longitudinally in the Nationwide Inpatient Sample data are a well-known shortcoming. Recent development in the Healthcare Cost and Utilization Project has made it possible to link patient-level hospital discharge records over time in New York and some other states. Future research may avoid the caveat of duplicate admissions in the Nationwide Inpatient Sample data by using individually linkable statewide hospital discharge data.

The findings of this article, if supported by further research, should serve as an important reminder to the anesthesiologist who encounters a peripartum patient with a headache. If the patient did not have a known dural puncture and/or does not have symptoms characteristic of a dural puncture headache, such as a strong positional component, a

complete neurologic exam and imaging should be performed before administering an epidural blood patch. Furthermore, sudden onset, association with nausea and vomiting, seizures, or depressed level of consciousness should suggest a more serious etiology, and neurologic consultation should be obtained immediately. On a positive note, with prompt recognition and care, subarachnoid hemorrhage in the setting of pregnancy is associated with lower morbidity and mortality than in the general population.

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