Let's Just Call It "Evidence-based Practice"

OBESITY among the population in general and our patients in particular has been a rapidly expanding problem (no pun intended …). For anesthesiologists, along with the weight gain come a host of related concerns: difficulty in airway management, significant comorbidities, and so on. In the same manner as the obstetric population's body mass index has been increasing, so, too, the use of spinal (*i.e.*, subarachnoid) block for cesarean delivery has been increasing. Spinal anesthesia in the obese or morbidly obese parturient raises the additional question: Should the dose of local anesthetic be increased, decreased, or the same compared with the nonobese parturient? Although a definitive answer has remained elusive, the idea that spinal anesthetic doses for cesarean section in the morbidly obese *need to be reduced* has gained popularity. The report by Carvalho *et al.*[1] in this issue sheds new light on the subject. In a nutshell, they performed a dose-response study of morbidly obese parturients undergoing elective cesarean delivery. When the results are compared with a similar study done by the same group in nonobese parturients,[2] the ED_{50} and ED_{95} of spinal bupivacaine were essentially the same.

It was with some curiosity that I set out to find the origin of the recommendation for reduced local anesthetic doses in this population. Logically, I expected to find at least one clinical series documenting an increased incidence of unacceptably high or total spinal blocks in this population, and I also expected the series to show that lower doses of local anesthetics are adequate for surgical anesthesia. In fact, the reality is quite different; it appears much of the rationale for reduced dosing recommendations is based on extrapolation, conjecture, and probably anesthetic misadventure.

There is a modest amount of evidence that the morbidly obese require less epidural local anesthetic for labor analgesia,[3] and no doubt many who advocate lower doses for spinal anesthesia are extrapolating from this or similar studies. Of published reports that actually address spinal anesthesia, few address parturients specifically. Some have looked at anesthetic agents that are not routinely used in the United States, and at doses rarely employed in modern practice. Strangely enough, one study often cited in support of lower spinal doses is the review article by Nicholas Greene[4] published 25 yr ago; this is quite surprising, because Greene wrote "… How much a patient weighs has no effect on the distribution of local anesthetic in CSF …" and "… Clinical experience indicates that obesity is of little, if any, direct clinical significance in determining spread of local anesthetic solutions in CSF."

During my residency more than 20 yr ago, I clearly remember texts and faculty members advocating that the dose of spinal local anesthetic should be based on the patient's height. During my fellowship in obstetric anesthesia, I was disabused of this notion based on contemporaneous studies which showed that no readily measured patient variable predicted the resulting block level[5,6]—neither height nor weight, nor body mass index. The practical upshot of this was that everyone who presented for cesarean delivery received pretty much the same spinal anesthetic; there was no need to adjust it based on height or weight, because there was no evidence that it affected the resulting block. Other factors, such as the position of the patient, the attitude of the operating table, and even the pillows on it, were more important. For more than 20 yr I have blithely carried on, administering the same dose of local anesthetic to all my cesarean patients, even as their average body mass index has increased. The incidence of complications has not shown any demonstrable increase, and I can say (although I will not mention any names …) that there are many prominent obstetric anesthesiologists who follow the same practice.

Although none of us relishes the thought of a high spinal anesthetic in an obese patient, neither do we enjoy trying to salvage an inadequate block during an open abdominal procedure. This latter possibility is highlighted by Carvalho's finding that even at the lowest doses studied, it was common to attain a satisfactory initial level, but few of the low-dose blocks proved adequate for the surgery. Ultimately, well-done clinical studies, such as Carvalho *et al.*,[1] will help us avoid both scenarios.

The study does have its limitations: the sample size is relatively small, meaning the confidence intervals are large, and their dose range did not even include the calculated ED_{95} for surgical success, so it must be taken with a grain of salt. But, it provides a great deal of information, should we choose to use it. The ED_{50}, which can be quite accurately estimated with smaller samples, is actually slightly *higher* for morbidly obese than for normal parturients, compared with the previously published study by the same group; practically speaking, it likely indicates the dose-response curves are nearly the same. In addition, a comparison of the dose-response curves between the two studies suggests that the slope is flatter in the morbidly obese group, which indicates greater variability of response, particularly at the upper (calculated, not observed) reaches of the curve; this lends credence to the investigators' assertion that combined spinal-epidural might actually be the wisest choice for these procedures.

◆ This Editorial View accompanies the following articles: Carvalho B, Collins J, Drover DR, Ralls LA, Riley ET: The ED_{50} and ED_{95} of intrathecal bupivacaine in morbidly obese patients undergoing cesarean delivery. ANESTHESIOLOGY 2011; 114:529–35.

Accepted for publication November 10, 2010. The author is not supported by, nor maintains any financial interest in, any commercial activity that may be associated with the topic of this article.

 Anesthesiology 2011; 114: 481–2

Do not misunderstand me: Planning an anesthetic for each of these patients should be no less thorough than for any other case and must include consideration of respiratory, cardiac, and other comorbidities. It should also include consideration of all the anesthetic techniques at our disposal, including spinal and epidural anesthesia, combined spinal-epidural, continuous spinal anesthesia, even (dare I say it?) general anesthesia. Ultimately, however, when it comes to single-shot spinal anesthesia for cesarean delivery, there is no *evidence-based* reason to lower anesthetic dose solely on the basis of body mass index. This study reinforces the concept that the response to spinal anesthesia is similar between obese and nonobese parturients, and personally, I will continue to practice as such, until someone shows me a better, more relevant clinical study.

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