Spinal Anesthesia in Severely Preeclamptic Women

When Is It Safe?

THE use of subarachnoid block for cesarean delivery has been increasing in the United States.1 Indeed, spinal anesthesia may be a better and more cost-effective technique for routine cesarean delivery than epidural block.2 Nonetheless, epidural anesthesia has been the preferred method of anesthesia for cesarean delivery in women with severe preeclampsia because of the severity and incidence of hypotension.3 The criteria for enrollment in the study were the diagnosis of preeclampsia and severe hypertension, with a systolic or diastolic blood pressure, or both, of greater than 160 and 110 mmHg, respectively. This is particularly important because most, but not all, patients meeting the American College of Obstetricians and Gynecologists criteria for severe preeclampsia have significant hypertension.4 The authors also limited participation to those women who were not in labor, because labor itself has been shown to reduce the frequency and severity of hypotension during regional anesthesia for cesarean section.5 In the current study, the mean change in mean arterial blood pressure was similar with spinal and epidural anesthesia, being approximately 15 mmHg.6 The lowest mean arterial blood pressure (calculated from the author's data), not necessarily during the induction to delivery interval, was also similar: namely, 58 mmHg in the spinal group and 55 mmHg in the epidural group. There was also not difference between the two techniques in the requirement for ephedrine. However, it is important to note that women receiving spinal anesthesia were given approximately 400 ml more crystalloid than those in the epidural group. The authors correctly indicate that their findings may be affected by their use of a retrospective study design. For instance, selection of an anesthetic technique for an

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individual patient was at the discretion of the anesthesiologist. Therefore, the potential existed for “sicker” women to be given epidural rather than spinal anesthesia. Indeed, women undergoing epidural anesthesia were treated with antihypertensive drugs more frequently than those given spinal anesthesia, suggesting that, although their hypertension was not more severe than in the spinal anesthesia group, it was nonetheless more difficult to treat. Secondly, it is impossible to ascertain for how long these patients were hypertensive. This could be of significance because it is conceivable that women with longstanding hypertension could react differently to sudden sympathetic blockade than women with relatively acute elevations in blood pressure. Lastly, the authors were only able to determine the lowest recorded blood pressure that may or may not be indicative of the lowest actual blood pressure during the anesthetic. Nonetheless, taken together with the results of a previous prospective randomized trial by Wallace et al., which compared the hemodynamic effects of general, epidural, and spinal (combined spinal–epidural) anesthesia in preeclamptic women, it appears that spinal anesthesia may be used as safely as epidural block in some situations in which a cesarean delivery is necessary in a severely preeclamptic woman. Those who remain skeptical will continue to use epidural anesthesia during these circumstances when there are no time constraints.

Nonetheless, these findings will be welcomed by anesthesiologists caring for pregnant women, particularly if applied to at least two clinical situations. First, women with severe preeclampsia may require urgent cesarean delivery because of nonreassuring fetal status. Because of its rapidity and simplicity, spinal anesthesia has been successfully used as an alternative to general anesthesia for emergency cesarean delivery in normotensive women who do not have a functioning labor epidural. One of the reasons for the acceptance of spinal anesthesia for emergency delivery in normotensive women has been a reappraisal of the need for prophylactic crystalloid administration in the prevention of hypotension after spinal anesthesia. Rout et al. suggested that the relatively small reduction (16%) in the incidence of hypotension with prophylactic crystalloid administration does not necessitate that a fixed volume of fluid be administered before inducing spinal anesthesia for emergency cesarean delivery. However, severe preeclampsia usually is associated with varying degrees of intravascular volume contraction, and it remains to be determined whether severely preeclamptic women can forgo a substantial crystalloid preload before spinal anesthesia without an undue risk of severe hypotension. For that reason, the use of spinal anesthesia in emergency situations, in which it would be of greatest benefit to preeclamptic women in avoiding the need for general anesthesia, may be limited by the time available to prehydrate the patient. Furthermore, placental abruption, which is frequently associated with hypertensive diseases of pregnancy and the need for emergency cesarean delivery, may result in significant maternal hypovolemia caused by retroplacental bleeding. In the meantime, until additional data become available, it would seem prudent to place an epidural catheter, and to test it, in those women with severe preeclampsia who are in labor and at risk for emergency cesarean delivery. Where this is not feasible, the risk of hypotension with spinal anesthesia in an acute emergency should be weighed against the risk of an airway catastrophe with general anesthesia. Indeed, in the United States between 1985 and 1990, the case fatality rate directly attributed to anesthesia was approximately 17 times greater with general anesthesia as compared to regional anesthesia. Unfortunately, it is unknown what the specific case fatality rates are for severely preeclamptic women undergoing general or regional anesthesia. However, the risks may be even greater because general anesthesia in preeclamptic women has its own particular hazards caused by airway edema and hypertensive response to laryngoscopy and intubation.

Second, it is a common belief that regional anesthesia is relatively contraindicated when the platelet count is fewer than 100,000/mm³. In addition to hypertension, women with preeclampsia may also have a reduced quantity and qualitative dysfunction of platelets. Although there are no studies supporting the notion, common sense leads many anesthesiologists caring for these patients to choose spinal anesthesia with a small-gauge needle rather than with the larger needle necessary for continuous epidural block. For those anesthesiologists, the findings by Hood and Curry remove the additional worry of severe hemodynamic compromise after spinal anesthesia.

In summary, using a retrospective study design, Hood and Curry demonstrated that the hemodynamic effects of spinal and epidural anesthesia are similar in severely preeclamptic women undergoing a nonemergent cesarean delivery. More work is necessary to investigate the use of spinal anesthesia in severely preeclamptic women during circumstances in which it may have its greatest positive impact on maternal safety: for emergency cesarean delivery and in the presence of thrombocytopenia.
EDITORIAL VIEWS

Alan C. Santos, M.D., M.P.H.
Associate Professor of Anesthesiology
Obstetrics, Gynecology, and Women’s Health
Albert Einstein College of Medicine/Montefiore
Medical Center
Bronx, New York 10461
OBANESDOC@AOL.COM

References


