Clinical Update 2010: Phenylephrine Infusions During Cesarean Section

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Objective: Upon completion of this presentation, participants will understand the evidence for utilizing phenylephrine by infusion for preventing and treating hypotension during cesarean section under spinal anesthesia

Summary: Prevention and treatment of hypotension after spinal anesthesia for cesarean section has been one of the central goals of obstetric anesthesia for decades. During that time, a variety of vasopressor and fluids, given prophylactically or in response to hypotension, have been utilized, but the most popular by far was ephedrine given by intravenous bolus. A recent survey suggested that most anesthesiologists were still using boluses of ephedrine to treat maternal hypotension. (1)

In the 1990s, several studies suggested that the alpha1-agonist phenylephrine and other “pure vasoconstrictors” (2-4) might be as good or better than ephedrine at maintaining maternal blood pressure, and might even maintain better fetal acid-base status. Adding phenylephrine to an ephedrine infusion appeared to have beneficial effects on maternal hemodynamic and fetal acid-base status. (5)

Over the past decade, Cooper (6), and Ngan Kee (7-9) have shown that phenylephrine infusions, sometimes combined with aggressive fluid administration (“co-loading”) once the spinal anesthetic is administered, can almost eliminate maternal hypotension and its side effects (nausea, vomiting, dizziness). Ngan Kee has recently demonstrated that ephedrine crosses the placenta to a much greater degree than phenylephrine, which may be related to the reason that neonates born with ephedrine therapy tend to have a lower pH. (10)

I recently wrote an editorial suggesting that the evidence is now strong enough to change routine practice, and that most anesthesiologists should be using phenylephrine infusions at elective cesarean deliveries because of the beneficial effects for mom and baby, arguing that a long-sought “solution” to the hypotension problem has been found and that the “burden of proof” has now shifted to those who do not use phenylephrine infusions to show why they should not. (11)

Key Points:
1. Multiple studies have demonstrated phenylephrine is safe and perhaps slightly superior to ephedrine for maintaining fetal/neonatal acid-base status
2. Maternal side effects (chiefly nausea and vomiting) are significantly less when a phenylephrine is the drug used to prevent hypotension when compared to ephedrine
3. Theoretical considerations and several studies suggest that infusions of phenylephrine lead to more stable blood pressure, fewer side effects (bradycardia or hypertension) than bolus strategies

References: