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LETTER TO THE EDITOR

Vasopressors against post-spinal anesthesia hypotension

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To the Editor:

We read with great interest the paper published by Hassabelnaby et al. [1] comparing epinephrine vs. phenylephrine infusion for prophylaxis against maternal hypotension after spinal anesthesia for cesarean delivery. The authors concluded that epinephrine and phenylephrine infusion produced comparable maternal hemodynamics and neonatal outcomes. However, the study warrants a closer examination due to certain aspects of study design, potential variation in definition of hypotension, and failure to account for the effect of important covariates.

Although, the authors attempted to standardize the hemodynamic profile of the study population by excluding patients with hypertensive disorders and systolic blood pressure (SBP) < 100 mmHg, using SBP alone as a criterion can result in unreliable diagnosis of hypo or hypertension. It is not clear if the diagnosis of spinal hypotension and severe spinal hypotension episodes were based on one reading of SBP < 80% and < 60% of the baseline, without repeat measurement within a defined length of time. The duration of hypotension plays a more critical role than severity of hypotension. A transient blood pressure drop ≥ 30% do not affect the Apgar scores or blood oxygen saturation levels of neonates [2]. In fact, hypotension ≤ 2 min has shown no adverse effects on maternal and neonatal outcomes. Maternal hypotension ≥ 4 min is known to be associated with neurobehavioral changes in the first 4 to 7 days of the neonate's life [2]. Since the authors already employed an additional confirmatory criteria of > 1 reading for treatment of severe hypertension, perhaps similar confirmatory steps for hypotension would have provided more reliable diagnosis. Additionally, the authors relied only on SBP to diagnose hypo / hypertensives episodes without considering diastolic blood pressure (DBP). Kandil et al., conducted a detailed analysis to explore the sensitivity and predictability of SBP, DBP and mean arterial pressure (MAP) in the diagnosis of hypertension and concluded that MAP values provided highest predictability in detecting hypertension than using SBP or DBP alone [3].

In addition, the authors mentioned that intraoperative fluid was administered to a maximum of 1.5 L. It is not clear if there is significant variation in the volume of the administered fluid among the study patients. Intravenous fluid preloading and co-loading are the two most commonly used strategies to reduce the incidence of post-spinal anesthesia hypotension [4]. Fluid loading not only improves hemodynamic stability but also reduces vasopressor requirements after spinal anesthesia for cesarean delivery [4]. Without adjusting for the effect of fluid administration, any comparison between epinephrine vs. phenylephrine infusion to prophylactically control hypotension may not provide reliable results. Similarly, the authors did not present detailed data on the rescue phenylephrine and ephedrine boluses used to manage spinal and severe spinal hypotension. Despite the fact that total percentage of incidences of spinal hypotension were 18% in epinephrine group and 30% in phenylephrine group, the median number of hypotensive episodes per patient are 0 for both groups. The administration of rescue bolus was based on a drop in SBP and heart rate, but the manuscript did not provide heart rate data for the patients who experienced post-spinal hypotension. Use of

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vasopressor bolus, such as ephedrine, phenylephrine, and norepinephrine, are effective pharmacologic therapies against post-spinal hypotension [5]. Xue et al. concluded that 5–10 mg of ephedrine and 13–16 µg of norepinephrine are equally effective against spinal induced hypotension, when given as prophylactic boluses [5].

Finally, the manuscript did not present detailed data for important covariates that can directly or indirectly affect the hemodynamic profile of patients. The study lacked data on hemoglobin levels, estimated blood loss during surgery, and blood product administered. The prevalence of iron deficiency anemia among rural Egyptian pregnant females has been reported as high as 51% [6]. Patients undergoing cesarean section with pre-existing anemia are susceptible to hemodynamic instability and large variation in SBP [7]. Similarly, the volume of blood loss and blood transfusion can directly affect the perioperative SBP and patient outcomes after the cesarean delivery. The authors used only univariable statistical analysis to test the study hypothesis. This does not adjust the relationship between two variables for the effect of other potential risk factors. A multivariable statistical model that includes all potential covariates would have provided more accurate results.

We commend the authors efforts to investigate the role of epinephrine and phenylephrine infusion in managing post-spinal anesthesia hypotension. The current study does not provide strong evidence to support a change in clinical practice. Further research is warranted to evaluate the role of each vasopressor and associated complications.

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Declarations

Conflict of interest None.

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