A recommendation for cost-effective preparation of phenylephrine

Madam,

The most common side effect of spinal anesthesia for cesarean section is hypotension due to sympathectomy, which affects approximately 55–90% of patients and if untreated, can compromise feto-placental circulation. Treatment of spinal-induced hypotension includes fluid loading and vasopressors. The vasopressor of choice is phenylephrine, but ephedrine and mephentermine are also being used at some centers.

Mephentermine is available in multidose 10 ml vial (30 mg/ml) and 15 mg/ml ampoule and is administered in the boluses of 3–6 mg to treat hypotension. Ephedrine is available in 30 mg/ml ampoule and used in bolus doses of 5–15 mg. We can obtain these dosages conveniently with dilution in a single syringe.

Phenylephrine is recommended for use in obstetric anesthesia to prevent or treat spinal-induced hypotension. This is due to marked arterial vasoconstriction caused by its $\alpha_1$-agonist
action. Though, at times, phenylephrine is used for continuous infusion and thus requires concentrated drug for its use in large quantity. However, routine bolus doses require appropriate dilution.

As per the guidelines issued by various societies, phenylephrine is the recommended vasopressor because of improved fetal acid–base status.[2-4] The recommended bolus dose of phenylephrine for treatment of spinal-induced hypotension is 40–100 mcg.[5] Because it is available as 10 mg/ml ampoule, multiple dilutions are required to get the desired bolus dose of 50–100 mcg/ml. Such an exercise of repeated dilutions is not only inconvenient and time-consuming but may also lead to drug dose errors if not done diligently.[6] Some practitioners prefer to dilute the ampoule drug in 100 ml of normal saline and use it as and when required and serves for both boluses and loading syringes for infusion. This does not require repeated dilution when syringes are used. Although prefilled syringes (PFS) of phenylephrine are available as 50 mcg/ml, its availability and high cost are a concern.

Pharmaceutical companies, many a times, manufacture vials and ampoules of a same drug in different strengths. A desired strength ampoule is adapted to practice depending on the usage requirements. For example, Dalteparin sodium, a low molecular weight heparin is available in both forms, prefilled syringes and multidose vials.

Hence, we recommend that phenylephrine ampoules are also made available in strengths similar to PFS (50, 100 mcg/ml, etc.) or as multidose vials in strengths of 50 or 100 mcg/ml. This will have many advantages like being user-friendly, cost-effective, having ease of drawing up desired dilution of drug, thus saving time in an emergent situation and by avoiding drug wastage when compared to use of a 10 mcg/ml ampoule. And to our belief, this will lead to more widespread use of phenylephrine to treat spinal-induced hypotension, especially in obstetric population.

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