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Intravenous Fluid Preload in the Prevention of Spinal Block-induced Hypotension in Parturients: II

To the Editor:—The results of the study by Rout and coworkers¹ concerning the apparent lack of efficacy of intravenous fluid preload in preventing spinal anesthesia-induced hypotension during elective cesarean section are difficult to interpret because they tend to contradict a sizeable body of previously published work. Administration of intravenous fluid has been shown to increase the central venous pressure in parturients so that subsequent spinal anesthesia results in a pressure similar to the baseline level in nonhydrated controls.² In a group of healthy gravidas scheduled for cesarean section during lumbar extradural block, when no preload had been administered, maternal mean arterial pressure as well as intervillous blood flow decreased after institution of the block, whereas in a group pretreated with 10 ml/kg plasma expander, blood pressure remained stable and intervillous blood flow increased temporarily.³ A study of the effects of intravenous infusion and epidural block on maternal uteroplacental and fetal umbilical artery flow velocity waveforms revealed that both the infusion of 1 l crystalloid solution and epidural block with bupivacaine decreased systolic/diastolic ratios. This suggested a beneficial effect on uteroplacental blood flow.⁴

An explanation for the high incidence of hypotension in the investigation by Rout *et al.*¹ may lie in the nutritional state of the parturients who were studied. There is no mention of the period of abstinence from oral intake. Pregnant women who fast develop starvation ketosis rapidly. The associated hypoglycemia usually results in release of counterregulatory hormones of which epinephrine is the most prominent.⁵ Spinal anesthesia-induced sympathetic block interferes with this reaction to a low blood glucose state and can result in more profound than expected decrease in blood pressure. Thus, intravenous administration of 6 g/h dextrose before cesarean section has been recommended.⁶ Infusion of large volumes of intravenous fluids that do not contain dextrose to fasting parturients may not produce the expected effect of blood pressure maintenance in the face of widespread sympathetic block.

The conclusion that no absolute requirement for a fixed amount of preload should prevent administration of a spinal block in urgent cesarean section cases is not new. Brownridge⁷ stated that "spinal block proved to be particularly valuable when anaesthesia was required urgently in the delivery suite, and may even be regarded as the anaesthetic of choice in such circumstances." Marx and coworkers⁸ reported better fetal-neonatal recovery in emergency cesarean sections performed with spinal block than in those with general anesthesia. Furthermore, in urgent circumstances, large volumes of intravenous fluid can be infused rapidly and safely with the aid of an in-line pump.

Intravenous hydration before administration of regional block in obstetrics serves not only to prevent sympathetic block-induced hypotension but also to improve uteroplacental blood flow. It would be unfortunate if clinicians were to avoid augmenting intravascular

volume before administering a spinal block in the misguided belief that no benefit could be expected.

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