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Title EFFECT OF I.V. FLUIDS ON MATERNAL AND FETAL BLOOD GLUCOSE

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Introduction. Prevention of post-regional block hypotension by rapid intravenous hydration has become a routine measure in obstetrics.¹⁻³ Dextrose-containing electrolyte fluid has been preferred, as the hypertonicity of dextrose expands the circulating blood volume more efficiently than solutions without dextrose. However, the infusion of dextrose raises the maternal blood glucose level and, since glucose traverses the placenta freely, fetal hyperglycemia may develop and, in turn, lead to neonatal hypoglycemia.⁴ Therefore, a clinical study was undertaken to evaluate the effect of two different types of intravenous fluid therapy on maternal and fetal blood glucose levels.

Methods. Fasting blood glucose was measured in 60 healthy gravidae scheduled for cesarean section at 8 A.M. The women were divided into two groups. Group I (30 patients) received 800 - 100 ml of lactated Ringer's solution with 5% dextrose up to the time of delivery. Of these, 15 were given epidural analgesia and 15 balanced general anesthesia. Group II (30 women) received 500 ml of lactated Ringer's solution with 5% dextrose and 300 - 650 ml of physiologic saline up to the time of parturition. Again, 15 patients were given epidural analgesia and 15 general anesthesia. The duration of intravenous hydration and the amount of fluid infused to the time of delivery were recorded. At parturition, maternal and umbilical vein bloods were sampled for glucose measurements. Glucose levels were determined by the Dextrostix method.⁵ Student's t-test was used for the statistical analysis. Results are expressed as the mean \pm 1 standard deviation.

Results. Fasting maternal blood glucose levels ranged from 45-90 mg% (mean 67.5 ± 18.8). Forty-eight percent of the gravidae had fasting glucose levels of 60 mg% or below. The two groups demonstrated significantly different ($p < 0.001$) blood glucose levels at delivery. In group I, levels ranged from 175 to 250 mg% (mean 193.3 ± 25.3) and in group II, from 130 to 150 mg% (mean 136.6 ± 6.3). The total amounts of infused fluid and the durations of infusion

were comparable in the two groups, and in neither group was there a significant difference between regional analgesia and general anesthesia. Umbilical vein blood glucose levels approximated those of the maternal blood in all cases. None of the women under epidural analgesia developed clinically significant hypotension, and none of the infants showed signs of hypoglycemia in the postnatal period.

Discussion. Approximately one-half of the parturients were severely hypoglycemic before initiation of intravenous hydration. Administration of one liter of a dextrose-containing solution led to both maternal and fetal hyperglycemia. Restriction of the dextrose-containing solution to one-half liter and subsequent infusion of an electrolyte solution without dextrose avoided the development of hyperglycemia in both mother and infant. Since hypotension was prevented with equal efficiency by the latter regime, we recommend that the initial dextrose-containing solution be restricted to 500 ml and that infusion be continued with a dextrose-free electrolyte solution.

References.

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