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Dextrose 10% in the treatment of out-of-hospital hypoglycemia.

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Abstract

INTRODUCTION: Prehospital first responders historically have treated hypoglycemia in the field with an IV bolus of 50 mL of 50% dextrose solution (D50). The California Contra Costa County Emergency Medical Services (EMS) system recently adopted a protocol of IV 10% dextrose solution (D10), due to frequent shortages and relatively high cost of D50. The feasibility, safety, and efficacy of this approach are reported using the experience of this EMS system.

METHODS: Over the course of 18 weeks, paramedics treated 239 hypoglycemic patients with D10 and recorded patient demographics and clinical outcomes. Of these, 203 patients were treated with 100 mL of D10 initially upon EMS arrival, and full data on response to treatment was available on 164 of the 203 patients. The 164 patients' capillary glucose response to initial infusion of 100 mL of D10 was calculated and a linear regression line fit between elapsed time and difference between initial and repeat glucose values. Feasibility, safety, and the need for repeat glucose infusions were examined.

RESULTS: The study cohort included 102 men and 62 women with a median age of 68 years. The median initial field blood glucose was 38 mg/dL, with a subsequent blood glucose median of 98 mg/dL. The median time to second glucose testing was eight minutes after beginning the 100 mL D10 infusion. Of 164 patients, 29 (18%) required an additional dose of IV D10 solution due to persistent or recurrent hypoglycemia, and one patient required a third dose. There were no reported adverse events or deaths related to D10 administration. Linear regression analysis of elapsed time and difference between initial and repeat glucose values showed near-zero correlation.

CONCLUSIONS: In addition to practical reasons of cost and availability, theoretical risks of using 50 mL of D50 in the out-of-hospital setting include extravasation injury, direct toxic effects of hypertonic dextrose, and potential neurotoxic effects of hyperglycemia. The results of one local EMS system over an 18-week period demonstrate the feasibility, safety, and efficacy of using 100 mL of D10 as an alternative. Additionally, the linear regression line of repeat glucose

measurements suggests that there may be little or no short-term decay in blood glucose values after D10 administration.

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