Effect of Dextran on o-Toluidine Methods for Glucose

To the Editor:

Dextran, mixtures of glucose polymers of various sizes, are used for improvement of circulation, for correction of hypovolemia, and for their antithrombogenic effects (1). The wide acceptance of o-toluidine methods for the determination of glucose in serum and plasma has prompted us to call attention to the fact that dextran interferes with such methods by causing turbidity. In addition, the quantitative effects of dextran on the following o-toluidine methods for glucose are presented: the direct manual method of Feteris (2), the direct automated method of Frings, Ratliff, and Dunn (3), and a manual method described by Cooper and McDaniel (4) utilizing a deproteinization procedure.

To determine the concentration of dextran in serum needed to produce interference in the o-toluidine methods studied, sera were prepared as follows: lyophilized serum (Hyland Laboratories, Los Angeles, Calif.) was resuspended in various concentrations of dextran (0.2, 0.5, 1.0, and 2.0 g/100 ml) prepared from commercially available solutions (Abbott Laboratories, Chicago, Ill.) of Dextran 70 (6 g/100 ml in saline, 0.9 g/100 ml) and Dextran 40 (10 g/100 ml in saline, 0.9 g/100 ml).

The quantitative positive interference of Dextran 40 and Dextran 70 with the o-toluidine methods studied is shown in Table 1. The higher the concentration of dextran in the serum, the greater the interference with these methods. Administration of 500 ml of a 6 g/100 ml solution of an intermediate molecular weight dextran results in an initial serum concentration of about 0.7 g/100 ml (4) while an infusion of 500 ml of Dextran 40 solution, 10 g/100 ml, results in an initial serum level of about 0.8 g/100 ml (4). Therefore, a single infusion of dextran results in a serum dextran concentration which greatly increases the "apparent" serum glucose concentration as determined by methods in which o-toluidine is used.

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References


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Preparation of a Stable Native Control Urine

To the Editor:

Attempts to prepare a stable native control urine for use as a reference control in clinical chemical laboratories until now have failed owing to bacterial decomposition of its components, associated with precipitation of crystalline urinary sediments. This can be prevented by the addition of bactericides (1) and of a complex-forming agent (2).

To 1 liter of fresh urine add 2 g of disodium-EDTA and—while vigorously shaking or stirring—add 5 ml of a solution of 100 g of thymol per liter of isopropanol. Two weeks later mucus and very small amounts of urine acid are removed by centrifugation or filtration. Thus treated, the urine becomes clear and almost odor-free; it can be stored for years at room temperature without alteration. Our test samples have been controlled since November 1966. Pathological urine components may be detected and quantitative determinations performed without interference, except in cases of complex formation with EDTA. In such cases, the complex must be destroyed.

References


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Revision in Flame Photometric Li Determination

To the Editor:

During a proficiency test of serum electrolytes conducted by the Pennsylvania Department of Health in May 1970, several reports of serum lithium levels were found to be approximately 50% lower than expected values.

Since lithium can be toxic to humans at levels only slightly above effective therapeutic concentrations, a public health danger was immediately apparent.

As a result of communications with laboratories which reported erroneous results, several discrepancies were disclosed in the methodology published in certain editions of the instruction handbook for the I. L. Flame Photometer. (Instrumentation Laboratories, Inc., Watertown, Mass.). These procedural discrepancies were confirmed through direct contact with technical representatives of the Instrumentation Laboratories, Inc. The company informed us that they have prepared and will distribute a revision of their operating procedure for

Table 1. Effect of Two Dextrans on Three o-Toluidine Methods for Serum Glucose

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* See text for conditions.

* Values represent single determinations.