chloric acid (I). We demonstrated that at pH 7.0, the pH at which the SMAC triglyceride method is run, the peak shifts to 322 nm with significant absorbance at 340 nm (Figure 1).

Metronidazole (M, 171) can cross the dialysis membrane in the SMAC, causing an increase in absorbance from the reagent baseline at 340 nm. The instrument apparently calculated this reversed absorbance change as a triglyceride value of "0". This was in fact demonstrated by adding metronidazole to serum and recording the sample and blank channels simultaneously on the SMAC chart recorder. On the aca the absorbance was increased by the same amount both times the reading was taken; the difference between them therefore still represented the triglyceride concentration.

Thus not only metronidazole can interfere with the SMAC triglyceride method, but any substance in serum with a low molecular mass that absorbs light at 340 nm has this potential. Other methods in which measurement is made at 340 nm without blank correction, such as glucose and inorganic phosphate, may produce falsely high results.

Reference

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Atypical Serum Creatine Kinase
MM and Myeloma during
Dermatomyositis

To the Editor:

Abnormal electrophoretic migration of creatine kinase (CK, EC 2.7.3.2) isoenzyme is a rare occurrence (1), often related to the existence of a CK-BB-IgG complex (2, 3). Abnormal migration of CK-MM has not been reported, and we describe such a case here.

Our patient, a 55-year-old woman, presented with typical symptoms of dermatomyositis: lilac coloration of eyelids, severe proximal and symmetrical muscular weakness, increased activity of the skeletal muscle isoenzyme of CK in serum, characteristic electromyographic patterns, and evidence of muscular necrosis, associated with signs of inflammation on the biopsy. Total serum CK activity was 265 U/L (upper normal limit in women, 90 U/L at 30°C).

In addition, electrophoresis showed an IgA lambda M-component, with migration in the α2 region. The diagnosis of myeloma was supported by decreased concentration of polyclonal Ig, Bence Jones proteinuria, and marked bone marrow infiltration by 24% of abnormal plasmacytoid cells.

Treatment with prednisone (1 mg/kg body wt. per day) resulted in clinical and biological muscular improvement. Malignancy in adult dermatomyositis occurs in 15% to 25% of the cases, but association with myeloma is rare (4). High activities of CK in the serum of dermatomyositis patients are usual, but atypical isoenzyme patterns have not yet been described.

Cellulose acetate electrophoresis analysis of our patient's serum shows an abnormally migrating band between isoenzymes MM and MB (5) representing 12.5% of total serum CK activity (Figure 1). Prior treatment of the serum with an anti-human CK-B or an anti-CK-M [immunoinhibition technique of Van Lente and Galen (6)] completely removed all CK activity only when we used anti-CK-M. We also noticed the disappearance of the atypical CK after addition of anti-IgA antibodies. On trying to separate the CK isoenzymes by an ion-exchange technique, we observed the elution of the abnormal isoenzyme in the "MB fraction"; moreover, after extended treatment with DEAE-Sephadex (7), we could not split off the whole CK-MM fraction from its complex.

Exclusion chromatography of the serum on Sephadex G200 produced two IgA peaks [located by immunonephelometry (8)] (Figure 2). CK activity was found only in the second peak, which probably contains monomeric IgA.

The two peaks present the same abnormal migration in the α2 region, as shown by treatment with anti-IgA.

We have been unable to reconstitute this atypical fraction after incubation of the three CK isoenzymes with different Ig fractions separated on Sephadex G200.

All these results suggest that the abnormal isoenzyme found in the serum of our patient is a complex of CK-MM with IgA.

References

Fig. 2. Elution pattern of patient's serum from a Sephadex G200 column.

Immunoglobulins measured by laser immunonephelometry. IgM not detected because of its low concentration, <0.1 g/L. V0 indicates the void volume of the column.

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Cefoxitin Interference with Serum Creatinine Measurement Varies with the Assay System

To the Editor:

Some cephalosporins interfere with measurement of serum creatinine (1–5): cefoxitin (2–4) and cephalothin (4, 5) cause spuriously high values; cephalapirin (4), cefazolin (4, 6), cefamandole (4), and moxalactam have no effect. The effect of cephalosporins on apparent serum creatinine determinations is influenced not only by the specific drug involved but also by the assay system used. For example, positive interference with serum creatinine assay by cephalothin is greater with the ASTRA 8 (Beckman) analyzer than with the Technicon SMAC analyzer (5). We evaluated the accuracy of three assay systems for serum creatinine measurements in the presence of cephalosporins in concentrations anticipated in clinical practice.

We used pooled serum from three healthy men, placing 2.8 mL of serum. Samples were mixed and assayed in duplicate in each of three automated analyzers (SMAC, acres, and Cobas). In all three the assay is based on the chromogenic reaction of creatinine with picric acid. In no case did moxalactam or cefotaxime show any effect on results for creatinine. Positive interference by cefoxitin was proportional to its concentration, but varied among the three assay systems, being greatest with the acres and least with the SMAC system. The relationship (Figure 1) between the cefoxitin concentration (x) and the serum creatinine (y) is described by equations y = 1.21 + 0.0068x for acres (r = 0.989), y = 1.09 + 0.0043x for Cobas (r = 0.999), and y = 1.13 + 0.0020x for SMAC (r = 0.989).

Serum creatinine assay, the test most commonly used to estimate renal function, is essential in monitoring therapy with aminoglycosides. Because cephalosporins are frequently used in conjunction with aminoglycosides, the influence of cefoxitin on results for serum creatinine is clinically important. During treatment with cefoxitin or cephalothin, blood for serum creatinine assay should be drawn before the dose and assayed with the SMAC analyzer to minimize falsely elevated creatinine measurements.

References

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Interference with the YSI Glucose Analyzer: A Comment from the Manufacturer

To the Editor:

Before the Yellow Springs Instrument Co., Inc. (YSI), introduced the Model 23A Glucose Analyzer in 1975, we extensively evaluated potential interference with glucose determination of more than 250 substances: anticoagulants, preservatives, substances of particular interest in diabetes, endogenous substances of general interest, radiopaque, lipids and related substances, drugs, poisons, and miscellaneous exogenous substances. A list of selected substances, the concentration at which they were evaluated, and an estimate of the concentration required to cause an error of 5% in glucose determination are provided in each Manual accompanying an instrument. In this table it is warned that subtle properties of probe-membrane combinations suggest that with some combinations there may be interference in concentrations less than, or up to several times more than, those indicated in the list (1).

In general, our evaluations were referred to our estimate of normally occurring concentrations of these substances. Recent information indicates that at least one substance, acetaminophen, which is shown on our list as a potential interference, is now a drug of abuse, and may be present in occasional patients in concentrations that could not have been anticipated. Under such circumstances it is indeed an interference, and has been reported as such by several workers (2–4). These results have been least qualitatively confirmed by our own investigations, with the caveat that measurements made on aqueous solutions of substances do not reflect the reduction of these substances by the body's defensive systems. The interfering effect of high concentrations of