between CA-19-9 concentrations in blood and whether or not patients were taking supplements.

Thus, cystic fibrosis is one of the first benign diseases shown to be associated with high CA-19-9 concentrations in blood. The origin of CA-19-9 in these patients is still unknown. It is unlikely to be derived from the pancreas because patients with pancreatitis reportedly have low concentrations of this antigen in their serum (2, 3). It may, however, be a specific mucin produced by cystic fibrosis patients. If so, a study on its mechanism of production might provide an insight into the etiology of cystic fibrosis. Finally, measurement of CA-19-9 in blood could be an adjuvant diagnostic aid in cystic fibrosis.

References

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Digoxin Determination in the Uremic Patient: Three Immunoassays Compared

To the Editor:

Three independent immunoassays gave significantly different results when digoxin was measured in the plasma of a 68-year-old patient with renal and liver impairment. These differences give some hints as to the structure of the digoxin-like immunoreactive substance (DLIS): the DLIS may have a structure like that of digoxin with respect to the lactone ring and the respective five- and six-member adjacent rings, but differing with respect to what is attached at position 3.

With the aim of improving our plasma digoxin assay service we currently are investigating three different immunoassays, assaying all patients' samples submitted for digoxin determination by all three. The above patient was receiving the following therapy intravenously: cimetidine 200 mg, folinic acid 6 mg, and tobramycin 40 mg daily, and hydrocortisone 100 mg four times daily, along with vitamins of the B complex. Values for some relevant clinical chemical tests were: urea 33.3 mmol/L (normal range 2.5–7.5), creatinine 207 μmol/L (50–130), aspartate aminotransferase 174 U/L (43), alkaline phosphatase 480 U/L (105), and total bilirubin 301 μmol/L (17).

The digoxin assays were Becton Dickinson’s Immunodiagnostics RIA, Abbott Laboratory’s polarization fluorescence immunoassay (TDx), and fluorescence immunoassay (Syva “Advance”), all performed according to the manufacturers’ recommendations.

The patient’s therapy with digoxin was stopped, for clinical reasons, and, after the last dose, samples of blood were collected at intervals of 6, 30, and 54 h. Digoxin was measured in plasma by all three methods with results as recorded in Figure 1. During this time the patient showed no symptoms of digoxin toxicity. A check for parallelism was made for all three methods by diluting the 6-h plasma sample with a digoxin-free serum. Curves for all the methods showed good parallelism, suggesting that the DLIS competes for antibody-binding sites to the same extent as digoxin itself. The RIA and the TDx methods gave similar patterns, fundamentally different from the Advance. The RIA method involves an antibody that is raised primarily against the C and D rings and leaves the lower internal. In the Advance assay the antibody attaches itself primarily to position 3, although there is some binding to the five-membered rings as well as the carbonyl group. Abbott was unwilling to disclose information regarding the specificity of their antibody; however, it does not seem unreasonable to assume that it is similar to the Becton Dickinson antibody, in view of their relative cross reactivities with digoxin: RIA 2.8%, TDx 3.6%, and Advance 100%.

The analytical results suggest that only the Advance method gave the probably correct result in our patient.

The question of the structure of DLIS is complicated by the fact that the patient was both receiving high doses of hydrocortisone and in acute renal failure (7).

We suspect that the DLIS in our patient could have some similarities with the DLIS that give falsely positive results in children, because the Syva xarr assay showed the lowest interference in a larger study, of neonates (2).

References

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Interference by Luteal-Phase Progesterone in a Commercial Kit for Measurement of 17α-Hydroxyprogesterone

To the Editor:

17α-Hydroxyprogesterone, a C-21 steroid, is produced by both the gonads and the adrenals. Its measurement is primarily used in screening for congenital adrenal hyperplasia, but more recently it has also been shown to be useful in evaluating women with hirsutism or infertility, either of which may be due to adult-onset partial enzyme defects causing adrenal hyperplasia (1–3).

Some radioimmunoassay kits for its measurement are currently available. In all, a specific antibody is said to be used, which eliminates the need for chromatographic separation of progesterone and 17-hydroxyprogesterone. We chose to evaluate the one supplied by Pantex (Santa Monica, CA). We selected this one for trial in our laboratory on the basis of the antibody specificity listed in their assay protocol, the cross reactivity with progesterone being specified as 0.7%. In our initial experiments we evaluated sensitivity finding it to be 0.5 μg/L, and interassay variation, which for two separate serum specimens, analyzed a total of 16 times each, was 12.8 and 12%, respectively. Mean analytical recoveries of