Adrenal

CLINICAL

which

CO2

The pH of the clarified supernate of the sample, as measured with a glass electrode, was 8.5–9.0. With glacial acetic acid added (5 mL/L) to the acetoneitrile solution of the internal standard, the pH of the resulting supernatant fluid was 5.5. (I am aware of the problem of assigning significance to pH measurements made on aqueous-organic solutions.) A comparison of the retention times for the internal standard and the relative retention times for theophylline in the absence and presence of added acetic acid is tabulated below.

<table>
<thead>
<tr>
<th></th>
<th>Without acetic acid</th>
<th>With acetic acid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saline (NaCl, 8.5 g/L)</td>
<td>11.45–11.90</td>
<td>11–11.91</td>
</tr>
<tr>
<td>8-Chlorotho.</td>
<td>11.52 min</td>
<td>0.419–0.415</td>
</tr>
<tr>
<td>Theophylline</td>
<td>(n = 6)</td>
<td>0.421</td>
</tr>
<tr>
<td>Serum 8-Chlorothe.</td>
<td>10.18–11.71</td>
<td>11.93</td>
</tr>
<tr>
<td>Theophylline</td>
<td>min (n = 5)</td>
<td>0.424–0.418</td>
</tr>
<tr>
<td>Theophylline</td>
<td>0.476</td>
<td>0.421</td>
</tr>
</tbody>
</table>

*n* = number of repeat determinations.

Thus the basicity of the samples prepared from pooled serum can affect the retention times of the internal standard and, secondarily, the relative retention times of the analyte. When the potential basicity is neutralized with excess acetic acid, the retention times become essentially constant. Adams et al. (4) have reported on the variability of the retention time of 8-chlorotheophylline as a function of pH. The stated amount of added acetic acid equals 1 μL, or about 17 μmol in 200 μL. (In 200 μL of serum there would be approximately 5 μmol of bicarbonate. It is well known that loss of CO₂ from serum produces an increase in the pH of serum exposed to air.)

With the above-described procedure, we can resolve theobromine, theophylline, dyphylline, and caffeine, which emerge from the column in that order. Acetaminophen can not be separated from theobromine. We have found no time-dependent “elution” of theophylline from serum under these conditions.

References


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**Adrenal Steroids in Metastatic Pleural Effusion**

To the Editor:

Pulmonary metastasis is common in patients with adrenal carcinoma (1). In the hormone-secreting functional tumors, the metastatic tissue usually produces the same hormonal secretions as the original tumor (2). Described below is a patient who had an undifferentiated left adrenal carcinoma with pulmonary metastasis and pleural effusion. The pleural fluid was found to contain significant amounts of 17-ketosteroids (17KS).

**Case report:** A 28-year-old woman presented with abdominal pain, amenorrhea, and rapidly progressive hirsutism of three months duration. Examination revealed a blood pressure of 150/110, severe acne and hirsutism, atrophy of breasts, and a large mass in the left upper quadrant. An intravenous pyelogram showed a large left suprarenal mass, which at laparotomy was found to be unresectable because of extension to the retroperitoneum. A biopsy of the tumor was read as an undifferentiated adrenocortical carcinoma.

One month after the laparotomy, the patient was found to have left pleural effusion. A chest radiograph revealed in addition multiple metastatic nodules in the left lung.

Twenty-four-hour urinary 17KS excretion (3) ranged from 122 to 204 mg (normal for women, 5–14) and 17-hydroxycorticosteroids (4) from 33.6 to 44 mg (normal, 1–10). About 1 L of pleural fluid was obtained and was found to contain abundant undifferentiated malignant epithelial cells. 17KS in the pleural fluid were 58 mg/L and 17-hydroxy steroids, 11.3 mg/L. Serum cortisol was 240 μg/L at 0800 and 400 μg/L at 2000 hours (normal <8).

The clinical picture of this patient was predominantly that of virilization, with only minor features of glucocorticoid excess. It is of interest that this is reflected in the 17KS and 17-hydroxycorticosteroids excretion rate in urine as well as in the metastatic pleural effusion.

References


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Direct Radioimmunoassay with Capillary Chromatography Tubes

To the Editor:

A problem common to all radioimmunoassays is the need to physically separate reactants before measuring radioactivity (1). This step usually involves laborious procedures, which are both time-consuming and require considerable expertise. We have developed a fast and reliable method in which separation is effected passively, without any additional operation.

In 1967, Orskov described a radioimmunoassay for insulin in which separation was achieved by ascending chromatography (2). When chromatography was completed, paper strips were cut and the antibody-bound and nonreacted free antigen fractions could be selectively measured by their proportional

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1 Worldwide patents applied for.