74.5% were found within 24 hours in a group of positive cultures, of which 16% contained slow growing organisms (table).

Microscopy has the advantage over subculturing in that if bacteria are detected a preliminary susceptibility test can be done. In this study the results of such a test could be read after another six to twelve hours in 74% of species. In this way the results of susceptibility testing could be reported within 36 hours of blood sampling in 60% of patients with clinically important bacteraemia.

The percentage of contaminated cultures sampled by experienced workers agreed with that of other workers; the much higher contamination figure for cultures taken by less experienced staff also agreed with that of other workers. Compared with published data, the results of Gram staining and microscopy after centrifugation of 2 ml samples at 3000 × g for five minutes detected clinically important bacteraemia as fast as more advanced and expensive culture methods.1–4

I thank Patrick Sturm and Petra Verstappen for their technical help.

References


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Letters to the Editor

Plasma enzyme changes in carcinoma of bronchus mimicking myocardial infarction

Patients with carcinoma may exhibit the presence of some rather unusual isoenzymes in circulating plasma.1 2 When these plasma enzyme activities change over time, however, diagnostic confusion may arise, as shown by the following case.

A 59 year old woman was admitted to the ear, nose, and throat unit after an episode of epistaxis. She collapsed in bed the same evening and complained of back and chest pain. She was transferred to a coronary care unit, where a tentative diagnosis of myocardial infarction was made. She had experienced chest discomfort in the recent past, and on this occasion the pain lasted longer and radiated to both arms.

An electrocardiogram showed no changes of acute ischaemia. There was T wave inversion in V1 and 2 and some increase in ST in leads III and IV. A chest radiograph showed some cardiac enlargement, but there was no evidence of neoplastic disease there, or in the lumbar spine or pelvis.

The table shows her enzyme activity over the eight days after admission. Creatine kinase-B subunit activity (CK-B) was measured quantitatively by the technique of immuno-inhibition (Boehringer, West Germany; No 300691). The pattern of enzyme changes over time were typical of those found after acute myocardial infarction with a rise in creatine kinase and serum aspartase transferase (AST) and a slower rise in α-hydroxybutyrate dehydrogenase (HBD) activities. She was treated for presumed myocardial infarction with bed rest and cardiac monitoring. Creatine kinase isoenzyme electrophoresis of the samples from days 2 and 3 then showed the presence of both CK-MM and
**Letters to the Editor**

**Enzyme activity (u/l)**

<table>
<thead>
<tr>
<th>Day after first admission</th>
<th>AST (37°C)</th>
<th>HBD (25°C)</th>
<th>Creatine kinase (37°C)</th>
<th>CK-B (37°C)</th>
<th>CK-B/CK %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Upper reference limit</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td>42</td>
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<td>2</td>
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<tr>
<td>6</td>
<td>36</td>
<td>438</td>
<td>64</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

AST = serum aspartate transferase activity; HBD = α-hydroxybutyrate dehydrogenase; CK = creatine kinase; CK-B = creatine kinase B subunit activity.

**CK-BB, CK-MB was absent.**

She was discharged from hospital three weeks after admission. Subsequently she experienced pains in both legs, limb weakness, and exhibited weight loss, anorexia, and general malaise. She was readmitted to hospital 18 days after discharge. Her liver was enlarged two to three finger breadths below the costal margin and a scan of the liver showed that there were cold areas in keeping with secondary carcinoma. Creatine kinase remained normal but α-hydroxybutyrate dehydrogenase was now increased to about three times the upper limit of normal. She deteriorated rapidly and died six days after readmission. Necropsy showed an oat cell carcinoma of bronchus with metastatic tumour deposits throughout the liver substance. There was no evidence of myocardial infarction or fibrosis, although there was coronary artery atheroma.

Increased serum lactate dehydrogenase (LD) activity is found in about one third of patients with malignant disease. The increases are greater and more common when the disease is widespread. The electrophoretic pattern shows an increase in the more cathodic isoenzymes, particularly LD 3, 4, and 5. Serum α-hydroxybutyrate dehydrogenase activity is occasionally also increased. Although the determination preferentially measures LD1, it is not specific to this fraction.

The presence of brain type creatine kinase has been observed in patients with disseminated malignancy arising from a primary bronchial carcinoma. Spooner et al. postulated that bleeding into a tumour deposit may release brain type creatine kinase from the metastasis into plasma. The combination of serial enzyme changes initially led to diagnostic confusion. This was further compounded by the finding of an increase in CK-B subunit activity.

Only when creatine kinase isoenzyme electrophoresis failed, to show the MB isoenzyme and confirmed the presence of the BB isoenzyme could myocardial infarction be excluded biochemically. This illustrates the importance of confirming B subunit increase by a technique specific for CK-MB, particularly when the percentage CK-B subunit activity in serum is high (greater than 12%, apparent CK-MB greater than 25%).

**References**


**Enteric coronavirus in symptomless homosexuals**

In January 1984 we started a small prospective study of enteric pathogens in male homosexuals attending a genitourinary medicine clinic. At their first attendance patients seen by one of us (MWB) and admitting to be homosexuals were asked to submit a stool sample to the laboratory.

Stool specimens were cultured for salmonellas, shigellas, and campylobacters using standard methods and were examined for parasites by light microscopy on direct preparations and after formol-ether concentration. Heat fixed faecal smears were examined for *Cryptosporidium* using a phenol-auramine stain. Where sufficient material was available, stools were prepared and examined for viruses by electron microscopy.

About 25% of patients submitted specimens as requested. The table shows the results. These confirm the prevalence of enteric parasites previously reported in homosexuals. The most striking finding of the survey, however, was the identification of coronaviruses by electron microscopy in eight of 23 (35%) of specimens (figure). By contrast, of 96 samples routinely submitted to the laboratory over the period of study from adult males aged between 18 and 50, only one was positive for coronavirus. This patient was a homosexual who was subsequently diagnosed as having acquired immune deficiency syndrome (AIDS).

Coronaviruses are well known to be causative agents of respiratory disease. In addition, enteric coronaviruses have been associated with some outbreaks of gastroenteritis and malabsorption. Enteric coronaviruses, however, have also been found in institutionalised patients without overt signs of illness, and their excretion may be protracted lasting up to several years. In the general population the pathological importance of excretion of enteric coronaviruses is not understood but may be indicative of poor hygienic standards.

The prevalence of enteric coronaviruses in male homosexuals in our study is very striking, and it is interesting that a recent study by Kern in Germany showed that 50% of patients with AIDS were excreting enteric coronaviruses whereas no virus particles were found in 18 control homosexuals.

Although sera are available from our patients, we have not felt ethically justified in retrospectively testing them for HIV antibody without their consent. It would be
Plasma enzyme changes in carcinoma of bronchus mimicking myocardial infarction.

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doi: 10.1136/jcp.39.10.1058

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