Reversal of narcotic-induced delay in gastric emptying and paracetamol absorption by naloxone

Narcotic analgesics inhibit gastric emptying and consequently delay the absorption of orally administered drugs such as paracetamol. This increases the risk of aspiration of gastric contents during induction of anaesthesia in women in labour after narcotic analgesics and is not reversed by metoclopramide. We have investigated the effect of the specific narcotic antagonist naloxone on narcotic-induced delay in gastric emptying.

Subjects, methods, and results

Gastric emptying and paracetamol absorption (20 mg/kg) were measured simultaneously in four fasting healthy volunteers aged 26-39 years, as described. Each subject was studied "blind" on three occasions in random order at least seven days apart, once after placebo injections, once 30 minutes after pentazocine 60 mg intramuscularly, and once 30 minutes after pentazocine and immediately after naloxone 1-2 mg intravenously.

Gastric emptying and paracetamol absorption were rapid in all the control studies (see table). The mean time to empty half of the ingested dose was 13 minutes and the mean peak plasma paracetamol concentration 23.8 mg/l 22.5 minutes after ingestion. After pentazocine, however, gastric emptying and paracetamol absorption were greatly delayed in all subjects. Fifty per cent gastric emptying occurred at 97.3 minutes (P<0.02; paired t test).

The mean peak plasma paracetamol concentration was only 10.8 mg/l, which occurred 160 minutes after ingestion (P<0.05 and P<0.01 respectively). This inhibition was largely reversed by naloxone. The gastric emptying measurements and mean time to peak plasma paracetamol concentration after pentazocine and naloxone did not differ significantly from control values (27.8 minutes and 25 minutes respectively). Nevertheless, the mean peak paracetamol concentration was only 15 mg/l, which was significantly lower than control values (P<0.05). This may reflect the short duration of action of naloxone compared with pentazocine. The total amount of paracetamol absorbed was not influenced by pentazocine administered alone or with naloxone. In the control studies 75%, 79%, and 74% of the administered doses of pentazocine and pentazocine and naloxone were recorded in the urine over 24 hours.

Comment

Gastric emptying and paracetamol absorption are severely inhibited by narcotic analgesics, and the delay in gastric emptying observed in women during labour is almost certainly attributable to narcotic analgesics. Metoclopramide does not reverse this delay. In this study naloxone largely reversed the effect of pentazocine on gastric emptying, though its effect was probably shorter. Larger doses of naloxone may produce a greater reversal of pentazocine's effects, and naloxone may more effectively reverse the effects of a pure narcotic agonist such as pethidine. When reversal of the effects of narcotic analgesics on gastric emptying is desirable—for example, immediately before anaesthesia during labour or in recurrent vomiting—intravenous naloxone reverses the delay in gastric emptying as well as the other effects of narcotics.

Isolation of Legionella pneumophila from blood culture

The severe lobar type of pneumonia and the other manifestations of legionnaire's disease all support occurrence of an early bacteremic phase in the illness. Though the causative organism has been cultured from lung tissue, pleural exudate, bronchial aspirate, and sputum on bacteriological media, it has proved difficult to demonstrate in blood. In the case now reported Legionella pneumophila, serogroup 1, was recovered from broth culture from blood before death and also from postmortem lung tissue by inoculation on bacteriological medium and into yolk sacs of fertile hens' eggs.

Case report

A retired 61-year-old man who had worked as a factory cleaner was admitted to hospital in a semi-conscious state. He was a heavy smoker with a history of chronic cough and extreme breathlessness on exertion. A partial gastrectomy two years previously because of haematemesis from a peptic ulcer had been followed then by an episode of left ventricular failure, from which he had recovered. More recently he had been reasonably well until a week before admission, when his cough exacerbated with production of brownish sputum. His condition deteriorated slowly and after five days amoxycillin was started. Despite this treatment, increasing dyspnoea and drowsiness led to emergency admission. Urine and stool samples were sterile.

Gastric emptying and paracetamol absorption

![Table showing mean and SE of gastric emptying time and peak plasma paracetamol concentration](http://www.bmj.com/)

<table>
<thead>
<tr>
<th>Drug</th>
<th>Mean (± SE) gastric emptying time (min)</th>
<th>Mean (± SE) peak plasma paracetamol concentration (µg/ml)</th>
<th>Mean (± SE) time to peak concentration (min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>13.0 ± 3.5</td>
<td>23.8 ± 1.9</td>
<td>22.5 ± 1.3</td>
</tr>
<tr>
<td>Pentazocine</td>
<td>97.3 ± 17.6</td>
<td>10.8 ± 0.6</td>
<td>160.0 ± 16.3</td>
</tr>
<tr>
<td>Pentazocine/naloxone</td>
<td>27.8 ± 7.6</td>
<td>15.0 ± 1.8</td>
<td>25.0 ± 1.8</td>
</tr>
</tbody>
</table>

blood culture before death and also from postmortem lung tissue by inoculation on bacteriological medium and into yolk sacs of fertile hens' eggs.
Successful management of cardiac tamponade in two cases of leukaemia

Cardiac tamponade is an uncommon complication of leukaemia. We report the cases of a child with acute lymphoblastic leukaemia (ALL) and an adult with chronic myelomonocytic leukaemia (CMML) who developed this complication.

Case reports

(1) A 12-year-old boy was admitted to hospital with sudden onset of left-sided chest pain. He looked ill, anaemic, and preferred sitting in bed to lying. He had moderate hepatosplenomegaly and generalised lymphadenopathy, distant heart sounds, and the cardiac apex displaced to the left anterior axillary line. His haemoglobin was 6.9 g/dl, white cell count $130 \times 10^9/l (130000/mm^3)$, and platelets $120 \times 10^9/l (120000/mm^3)$. The blood film and bone marrow were diagnostic of ALL. Radiographs of chest and electrocardiograms suggested a pericardial effusion. Chemotherapy for ALL was started. Over the next few days he deteriorated with shortness of breath, a much raised jugular venous pressure (JVP), and pulsus paradoxus. Ultrasound studies confirmed incipient cardiac tamponade. Under cover of two units of fresh frozen plasma and four units of platelet-rich plasma, because the prothrombin time was prolonged and the platelet count had dropped to $12 \times 10^9/l (12000/mm^3)$, 300 ml of dark, blood-stained fluid was aspirated from the pericardium. After that he felt immediate relief of symptoms and a radiograph showed a smaller cardiac shadow. He was discharged 13 days after admission and survived a further 30 months.

(2) A 66-year-old man diagnosed five months previously as a case of CMML was admitted to hospital with a two-week history of shortness of breath, attacks of nocturnal dyspnoea, and fatigue. His pulse rate was 100/min with paradox, the JVP was raised to the angle of jaw, and he had hepatomegaly. His apex beat was not palpable and heart sounds were distant. A chest radiograph and ultrasound showed a large pericardial effusion with incipient tamponade. His haemoglobin was 10.5 g/dl, white cells $19.1 \times 10^9/l (19100/mm^3)$, and platelets $70 \times 10^9/l (70000/mm^3)$. Under cover of 12 units of platelet concentrates and four units of fresh frozen plasma the pericardium was opened and 900 ml of blood removed. Bleeding points were arrested and tissue for biopsy taken from an area suspicious of infiltrate. Symptomatic relief was dramatic and the JVP normal after six hours. He was transfused with four units of packed red cells and two units of fresh frozen plasma immediately after the operation. Six units platelet concentrates were given daily for three days and two tablets co-trimoxazole 12 hourly for two weeks. Recovery was uneventful and he was well and in full-time employment five months after discharge.