SHORT REPORTS

Pain relief in chronic pancreatitis with epidural buprenorphine injection

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Background: The management of intractable pain in chronic pancreatitis is difficult. A novel method for its relief is described. Methods: Twelve patients were given a mixture of buprenorphine (0.3 mg) and blood (10-15 mL) into the epidural space. Results: All patients had pain relief lasting up to six months. Conclusion: Epidural buprenorphine injection is a simple, safe and effective method for pain relief in chronic pancreatitis. [Indian J Gastroenterol 1997; 16: 12-13]

Key words: Analgesia, epidural blood patch

Chronic pancreatitis is a relentlessly progressive fibro-inflammatory process which results in destruction of exocrine and endocrine elements of the pancreas. Most patients experience pain which can range from discomfort to complete incapacitation, and develop narcotic addiction.

Management of intractable pain in chronic pancreatitis remains difficult. Surgery (resection of pancreas or drainage of dilated ducts) offers pain relief only to selected patients. It is a major procedure, needs expertise, carries a definite risk, and is expensive. Neuroablative procedures (celiac plexus blocks) have problems of early recurrence of pain, inconsistent results, need for expertise, and complications; they often cannot be repeated.

A unique method of pain relief is described. The procedure is simple, avoids prolonged hospitalization, and achieves long-lasting pain relief.

Methods

Twelve patients (11 men, aged 12-40 years; 1 woman aged 25 years) with chronic pancreatitis were studied. The diagnosis was based on clinical and investigative evidence. Two patients had alcoholic pancreatitis; in ten patients the etiology was not known. All the patients had constant epigastric pain, either localized or radiating to the back, for 6 months to 2 years; pain increased with meals. All patients needed hospitalization for acute pain. The frequency of pain ranged from 1 to 4 times a month (median 3).

All patients underwent gastroenteroscopy, ultrasonography of abdomen, and X-ray abdomen. Four patients underwent ERCP. Four patients had diffuse pancreatic calcification; two had stones in the pancreatic duct, the rest had irregular, hyperechoic or edematous pancreas. Four patients had dilated ducts (median diameter 7.5 mm, range 7-9). No patient had raised serum amylase at any time. One patient had a pseudocyst which had been drained two months ago. One patient had had a large subdiaphragmatic collection which was drained one week prior. Both these patients were addicted to parenteral pentazocine (30 mg IM 4 to 5 times a day). Patients in chronic pain had received analgesics, antispasmodics, pancreatic enzyme supplements, dietary advice, and H2 receptor blockers, and those in acute exacerbation had been treated with nasogastric aspiration, antibiotics, intravenous fluids, analgesics and H2 receptor blockers, but with no relief in pain.

The procedure was approved by the hospital Ethics Committee. All patients gave informed consent. They underwent the procedure as surgery was not indicated (undilated ducts), or they were not willing or could not afford it.

Procedure

Ten to 15 mL of the patient's blood was collected in a 20 mL syringe aseptically. To this was added a suspension of 0.3 mg of buprenorphine base. The epidural space was located by loss of resistance at T9-10 or T8-9 with 18 G or 16 G Touhey needle. Five mL of xylocaine (1%) with adrenaline was injected to reduce pain/discomfort during injection. The blood-buprenorphine mixture was then injected in the epidural space over 5 to 6 minutes.

All patients received antibiotics for 5 days. They were observed for pain relief, respiration, sedation and any other side-effects. The assessor did not know the nature of the analgesic treatment received.

Pre and post procedure pain was assessed by the Lettin test. This test takes into consideration intensity and frequency of pain, analgesic intake, incapacitation due to pain, and sleep duration. These criteria are graded up to 4 according to severity; the maximum possible score is 20. A score of less than 3 was considered as excellent pain relief, 4 to 6 good; 7 to 8 satisfactory; more than 8 inadequate.

Patients were asked to follow up every week for the first month, then fortnightly for six months, or immediately on recurrence of pain. The block was repeated as soon as constant pain or a score of 6 or more recurred. The minimum duration of follow-up was 6 months; four patients were followed-up for 2½ years.

For repeat treatment, buprenorphine dose used was higher, being 0.6 mg and 0.9 mg in non-addicts and 1.2 mg and 1.8 mg in pentazocine addicts. The criteria for choosing these dosages were body weight and age of patient and, mainly, response to previous injection. In children and patients who had shown sedation for long duration and drop in respiration rate, the second dose was 0.6 mg; in patients who tolerated
the previous dose well, the second dose was 0.9 mg.

Results

All the patients had significant pain relief (Table 1). The average duration of satisfactory pain relief after a single injection was 6 months (range 4 to 7).

Table 1: Pain relief (group mean ± SD Lettin score)

<table>
<thead>
<tr>
<th>Patients given single block (n=8)</th>
<th>Before block</th>
<th>After block</th>
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</thead>
<tbody>
<tr>
<td>Day 1</td>
<td>Day 7</td>
<td>Month 1</td>
</tr>
<tr>
<td>15.1</td>
<td>3.1</td>
<td>1.6</td>
</tr>
<tr>
<td>±2.5</td>
<td>±1.3</td>
<td>±1.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Patients given repeated blocks (n=4)</th>
<th>Before block</th>
<th>After block</th>
<th>Repeat block (I)</th>
<th>Repeat block (II)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day 1</td>
<td>Day 7</td>
<td>Month 1</td>
<td>Day 6</td>
<td>Month 11</td>
</tr>
<tr>
<td>19.2</td>
<td>3.7</td>
<td>7.1</td>
<td>2.2</td>
<td>5.1</td>
</tr>
<tr>
<td>±0.9</td>
<td>±0.8</td>
<td>±1.1</td>
<td>±0.9</td>
<td>±0.4</td>
</tr>
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The Lettin score in the first two weeks was higher due to the use of mild analgesics for soreness of back and insomnia. In all patients, the pain relief immediately after the block was very good and lasted for at least a month. Recurrence and persistence of pain, though of less severity, was associated with a more chronic disease (Table 2). The side-effects observed were: sedation for an median of 10 hours (range 8-12) in 10 patients, nausea and/or vomiting for 24 to 48 hours in 9 patients, transient urinary hesitancy in four, and urinary retention needing catheterization in one patient. Six patients had mild pain during injection lasting for around 20 minutes. Respiratory depression was not noted; no patient had respiratory rate < 10 per minute.

Two patients who were addicted to pentazocine remained drug-free for the period of follow-up.

Discussion

The pain in chronic pancreatitis may be due to neural damage, since marked perineural infiltrate as well as extensive nerve entrapment by parenchymal fibrosis have been shown to occur in this disease. The use of epidural opioids for pain relief is well known. A major part of epidurally deposited drug is carried away and contributes to the cerebral effect, and is quickly excreted. Pain relief however is due to stimulation of opioid receptors at the segmental level without the drug reaching the brain; the quantity of drug needed for this is extremely small, being less than 5% of the deposited drug. Epidural blood patch is an established technique for treating postdural-puncture headache.

The remarkably long-lasting pain relief in the present study is due to the blood-buprenorphine mixture releasing the drug slowly over a long period. The red blood cell-plasma water partition coefficient of buprenorphine ranges between 6 and 15 depending on the time of equilibration. The red cells thus carry a major portion of the drug. Such long-lasting pain relief is not achieved with a single epidural injection. This is the first time that a system using an opioid for long-lasting pain relief has been conceived.

Compared to the present methods of pain relief, the proposed block is easy, reproducible, relatively noninvasive and safe. It offers long-term pain relief in patients with pancreatitis. In the present study it also appears to have addicted opioid addicts, most probably by offering substitution therapy.

References