Pain Control with Epidural Injection of Morphine

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Behar and associates recently described the successful treatment of ten patients suffering from pain by injection into the epidural space of 2 mg morphine in 10 ml saline solution.

We endeavoured to confirm the method and, in addition, to test its applicability in acute obstetric pain and in prolonged treatment of chronic pain.

METHOD

Sixty-two patients were divided into four groups as determined by the causes of pain: Group I, postoperative or traumatic pain (n = 30); Group II, pain after cesarean section (n = 10); Group III, labor pains (n = 15); Group IV, chronic pain (n = 7).

After full discussion of the proposed treatment with the patient, morphine, 2 mg, in 10 ml of saline solution was injected epidurally at the appropriate level so that the solution affected the involved somatic segments. Instructions were given to supplement the injection with narcotics at the patient's request. Patients in Groups I, II, and III were checked every two hours and their pain estimated according to the Magill grading of pain (0–5, 0 for no pain; 5 for intolerable pain). When a score was more than 2, treatment was considered unsuccessful. Patients were followed for at least 24 hours postoperatively.

In five of the patients in Group IV an indwelling catheter was used to administer repeated doses of morphine, as well as lidocaine.

RESULTS

**Group I, Postoperative and Traumatic Pain (Table 1).** The effect of the injection started to become evident within 6 minutes. Patients usually experienced relief of pain for 16–24 hours, and were able to move about and to breathe and cough freely. Blood-gas values were measured in the thoracotomy patients during postoperative artificial ventilation and subsequently during spontaneous breathing. No ventilatory problem was encountered. Relief was not sufficient to substitute for surgical anesthesia, nor did it abolish pain on pressure over the wound, but it either abolished pain at rest or enabled the patients to avoid the use of freely preferred narcotic sedation. Tidal volumes were within normal limits, movements of limbs and sensation were not noticeably impaired, and blood pressures remained unaltered.

<table>
<thead>
<tr>
<th>Operation for</th>
<th>Duration of Pain Relief</th>
<th>Number of Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fractured ribs</td>
<td>16 hours</td>
<td>1</td>
</tr>
<tr>
<td>Gastroscopy</td>
<td>24 hours</td>
<td>2</td>
</tr>
<tr>
<td>Femoral embolectomy</td>
<td>24 hours</td>
<td>2</td>
</tr>
<tr>
<td>Hysterectiony</td>
<td>4 hours, second injection, 9 hours</td>
<td>1</td>
</tr>
<tr>
<td>Prostatectomy</td>
<td>24 hours</td>
<td>3</td>
</tr>
</tbody>
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unit performed the injections, using an indwelling catheter with a bacterial filter for repeat injections (2 mg morphine in 10 ml of saline solution). The three patients who had metastases in lumbar vertebrae were treated with indwelling epidural catheters fitted with 2-μm filters. Each injection relieved pain for about eight hours for a period of five days, after which pain relief was insufficient. A single dose of 1 per cent lidocaine was then given, and subsequently the epidurally injected morphine was effective for another five days when the process was repeated. This continued until death.

**DISCUSSION**

Behar and colleagues have suggested that the effect of epidurally administered morphine may be due to absorption into the cerebrospinal fluid across the dura, so that while the systemic level of morphine is negligible, the concentration in the cerebrospinal fluid is relatively high, and may inhibit synaptic transmission in the substantia gelatinosa. Our results support this theory, and suggest that both successes and failures of this treatment can be explained in terms of cerebrospinal fluid concentrations.

The effects in Group I were very impressive, with consistent pain relief for as long as 24 hours and without noticeable side effects.

The patient with the thoracotomy whose pain did not respond to treatment was probably the victim of a technical error in placing the epidural catheter, while the hysterectomy patient with the short response to the first injection and a longer response to the second probably had inadequate spread of the solution to sacral segments.

In the two groups of obstetric patients, treatment was predictably less effective. If indeed the effect of the morphine occurs as a result of passage into the cerebrospinal fluid, it is reasonable to expect that the vasodilated state of the epidural space during labor would encourage systemic absorption of the morphine, so that less would pass to the cerebrospinal fluid. If one accepts a placebo response of 38 per cent, our results in patients during labor are only slightly better, and it seems probable that very little of the morphine penetrated the dura. Patients after cesarean section might be expected to have better responses than those in labor, but, perhaps for the same reasons, they might have less satisfactory responses than those in the general postoperative group.

The chronic pain group, with the exception of one patient who had no response to any treatment (including intrathecal injection of phenol), showed that pain relief was consistently feasible. Each injection gave eight to 12 hours of relief for the first five days, after which it became increasingly ineffective. By the tenth day lidocaine (10 ml; 1 per cent) provided relief of pain—followed after 30 minutes by a further morphine supplement. This restored the analgesic effect of the morphine (possibly by “closing the gate” to pain transmission) for about five days, when a further increment of lidocaine was found necessary and was again followed by a further respite for another five days.

**REFERENCES**