EXTRADURAL MORPHINE FOR THE RELIEF OF PAIN FOLLOWING CAESAREAN SECTION

W. A. CHAMBERS, A. MOWBRAY AND J. WILSON

SUMMARY
Thirty patients took part in a double-blind trial to compare morphine 10 mg i.m. with morphine 5 mg into the extradural space for pain relief following Caesarean section. With the extradural route the mean time to first analgesia was 7.95 h compared with 4.75 h for the i.m. route. The mean number of further doses of diamorphine 7.5 mg required for pain relief in the first 24 h was 1.93 (± 0.30) in the i.m. group and 1.46 (± 0.31) in the extradural group. There was a small but definite advantage in the use of the extradural route for the initial dose of morphine. No serious side-effects were noted in either group.

The introduction to clinical practice of the extradural administration of opiates for the relief of acute pain has been accompanied by conflicting claims as to the efficacy of this technique. Previous work has shown that it offers little significant advantage over i.m. administration when given to treat existing pain (McClure et al., 1980). It has also been demonstrated that better results can be obtained if morphine is given with the local anaesthetic and before the recurrence of pain (Chambers, Sinclair and Scott, 1981). This technique has also been found to be disappointing when given for the relief of pain in labour (Husemeyer, O’Connor and Davenport, 1980).

The following study was undertaken to evaluate the efficacy of this technique in the relief of pain following Caesarean section.

PATIENTS AND METHODS
Thirty unpremedicated patients, about to undergo Caesarean section, agreed to take part in the study, which had the approval of the local Ethics Committee. Twenty were scheduled for elective operation and 10 had failed to progress satisfactorily during labour. None of the patients had received any opiates before operation, analgesia in the labouring patients having been provided with extradural local anaesthetic. An extradural catheter was inserted at the second lumbar intervertebral space with the 8–10 cm mark at the skin. Anaesthesia was obtained with 0.5% bupivacaine or 1.5% etidocaine with adrenaline 1:200,000 according to the preference of the anaesthetist. After an adequate block was obtained, surgery was commenced. Immediately after delivery, oxytocin (Syntocinon) was administered (5 unit i.v., 5 unit by infusion) and shortly thereafter morphine sulphate was given. The anaesthetist supervising the patient in theatre determined the route of morphine administration by referring to a random list. Fifteen patients received morphine 5 mg in saline 10 ml into the extradural space and saline 1 ml i.m. The other 15 patients received morphine 10 mg i.m. and saline 10 ml extradurally. No patient required further doses of local anaesthetic extradurally for the relief of operative pain. At the end of the operation, the extradural catheter was removed. Diamorphine 7.5 mg was prescribed i.m. for pain after operation and this was administered at the discretion of the nursing staff in the ward.

Following surgery the patients were visited at 1-h intervals for 8 h after the morphine administration by another anaesthetist (W. A. C. or A. M.) who had not been present during the operation and who was unaware of the route of administration of the morphine. The patients were asked to complete a visual analogue scale for pain assessment and the times at which the local anaesthetic block disappeared and at which further postoperative analgesia was administered were noted together with the presence of any side-effects. The respiratory rate was recorded every hour.

The patients were visited again the following day, when further enquiry was made regarding side-effects. The total number of doses of diamorphine administered in the first 24 h was noted. The results were analysed using the Students \( t \) test and Wilcoxon’s rank sum test as appropriate.

© The Macmillan Press Ltd 1983
RESULTS

Operating conditions were satisfactory in all patients and no supplementary anaesthesia was required. There was no significant differences between the two groups of patients with regard to age, weight or height. Ten patients in each group had received bupivacaine and five etidocaine. There was no difference in the mean time in each group until the total disappearance of sensory loss following surgery and no individual patient had a block which lasted for more than 7 h.

There were two patients in the i.m. group and three in the extradural group who did not require any further analgesia in the first 24 h. The mean time to first analgesia was not significantly longer, but the mean total dose of diamorphine in the first 24 h was significantly lower in the extradural group when compared with the i.m. group ($P < 0.05$) (table I).

Pain scores were all low ($<1$) until the local anaesthetic block regressed from the lower thoracic segments. Thirteen of the 15 patients who had received morphine i.m. required pain relief at this time, whereas only nine of those who had received extradural morphine did.

Three patients in each group complained of nausea which responded well to the administration of a single dose of an anti-emetic. Four of these (two in each group) had received a further dose of opiate before experiencing nausea. The other two complained of nausea between 2 and 3 h after the initial administration of morphine. One patient who had received extradural morphine, and who had not required any further analgesia, experienced a severe generalized itch about 9 h after the administration. This was relieved by chlorpheniramine. There were no other side-effects and, in particular, no clinical evidence of respiratory depression. The slowest respiratory rate which was recorded was 10 b.p.m.

DISCUSSION

The results, although favouring the extradural group, showed that there was not a great difference between the groups with the doses used. We chose to use morphine 5 mg extradurally because this is the dose used clinically in our maternity unit and because of the side-effects which have been observed with greater doses. The study confirms our clinical impression that side-effects with this dose are relatively minor. We chose to compare this with what we believe to be a standard dose of morphine for i.m. administration.

**TABLE I. Requirements for analgesia after Caesarean section**

<table>
<thead>
<tr>
<th></th>
<th>Extradural (n = 15)</th>
<th>I.m. (n = 15)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. patients</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>requiring no</td>
<td>1.46 ± 0.31</td>
<td>1.93 ± 0.30</td>
</tr>
<tr>
<td>further analgesia</td>
<td>(mean ± SEM)</td>
<td>(mean ± SEM)</td>
</tr>
<tr>
<td>Time to 1st</td>
<td>7.95 ± 1.70</td>
<td>4.75 ± 0.66</td>
</tr>
<tr>
<td>analgesia (h)</td>
<td>(n = 12)</td>
<td>(n = 13)</td>
</tr>
</tbody>
</table>

In an open study, Husemeyer, O’Connor and Davenport (1980) found that morphine 2 mg was ineffective in relieving the pain of uterine contractions in established labour. These authors felt that the increased vascularity of the extradural space in late pregnancy may have led to the rapid clearance of the injected opiate and inadequate concentrations in the cerebrospinal fluid. It is unlikely that there is any large change in the vascularity of the extradural space immediately at delivery. Therefore, although we used a larger dose, we feel that rapid absorption is not the principal reason for the failure of this method in labour. It may be that the different nature of pain from uterine contractions is responsible. Another feature in an open study is that many clinicians will have become accustomed to observing the virtually complete relief of pain with the use of extradural local anaesthetic agents and have expected the same with other agents given by this route.

Although some clinicians may feel that it is best to “top-up” an extradural injection with further doses of an opiate (or local anaesthetic) there must be many Caesarean sections conducted under extradural anaesthesia in circumstances where the postoperative care of patients makes this undesirable. In these circumstances, it might be considered appropriate to administer an extradural dose of an opiate. We have demonstrated that this will produce some benefit, although this may not be as great as was once believed.

REFERENCES


EXTRADURAL MORPHINE AFTER CAESAREAN SECTION

UTILISATION DE LA MORPHINE PAR VOIE PERIDURALE POUR L'ANALGESIE POST-OPERATOIRE DES CESARIENNES

RESUME
Trente patientes ont participé à une expérimentation en double aveugle visant à comparer les effets de 10 mg de morphine i.m. et ceux de 5 mg de morphine dans l'espace peridural dans l'analgesie post-opératoire des cesariennes. Par la voie peridurale, la durée moyenne de la première analgesie était de 7,95 h, pour 4,75 h avec la voie intramusculaire. Le nombre moyen d'injections ultérieures de 7,5 mg de diamorphine nécessaires pour l'analgesie des premières 24 h était de 1,93 (± 0,30) pour le groupe “intramusculaire” et de 1,46 (± 0,31) pour le groupe “peridurale”. Il y avait un avantage net bien que faible en faveur de la voie peridurale pour la première dose de morphine. Aucun effet secondaire sérieux n'a été signalé dans l'un ou l'autre groupe.

EXTRADURALE MORPHINGABE ZUR SCHMERZBEHANDLUNG NACH KAISERSCHNITT

ZUSAMMENFASSUNG
Dreissig Patientinnen nahmen an einer Doppelblindstudie teil, um die extradurale Gabe von 5 mg Morphin mit 10 mg Morphin i.m. zur Schmerzstillung nach Kaiserschnitt zu vergleichen. Die mittlere Zeit bis zum ersten Analgeticumbedarf lag nach extraduraler Gabe bei 7,95 Stunden, nach i.m.-Gabe bei 4,75 Stunden. Die mittlere Anzahl weiterer Dosen von 7,5 mg Diamorphin in den ersten 24 h betrug in der i.m.-Gruppe 1,93 (± 0,3) und in der extradural-Gruppe 1,46 (± 0,3). Es fand sich ein kleiner aber entscheidender Vorteil bei der extraduralen Gabe der initialen Morphindosis. In keiner Gruppe kam es zu ernsthaften Nebenwirkungen.

MORFINA EXTRADURAL PARA EL ALIVIO DEL DOLOR DESPUES DE UNA OPERACION CESAREA

SUMARIO
Treinta pacientes participaron en un ensayo doble-ciego con el objeto de comparar la administración de 10 mg i.m. de morfina con 5 mg de morfina en el espacio extradural para aliviar el dolor después de una operación cesárea. Con la ruta extradural, el tiempo promedio de la primera analgesia fue de 7,95 h comparado con 4,75 h en la ruta i.m. El número promedio de dosis ulteriores de 7,5 mg de diamorfina necesarias para el alivio del dolor durante las primeras 24 h fue de 1,93 (±0,30) en el grupo i.m. y de 1,46 (±0,31) en el grupo extradural. Hubo una pequeña pero decisiva ventaja en el uso de la ruta extradural para la dosis inicial de morfina. No se observaron ningún efecto secundario grave en cualquiera de los grupos.