EXTRADURAL TEST DOSES IN LABOUR

Sir,—The extradural administration of local anaesthetic agents is undertaken frequently in labouring mothers and various techniques, using test doses of local anaesthetic, are recommended to confirm that the catheter has not passed into the subarachnoid space before the full dose of local anaesthetic is given.

Test doses are usually assessed by detecting alterations in maternal arterial pressure, or the loss of motor power in the legs [1]. However, a confirmatory sign that is useful in labouring mothers is to wait for 5 min after the administration of the test dose and to observe the mother during the following contraction. If the pain from the contraction has not altered, it is unlikely that the drug has been deposited in the subarachnoid space before the full dose of local anaesthetic is given.

To demonstrate the validity of the sign, it is sufficient to perform a subarachnoid anaesthetic for an operative delivery in a labouring mother and to note how quickly contractions change in nature.

Where top-ups are administered by midwives, the sign could form a useful basis for them to assess test doses—a subject that is controversial [1].

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CONTINUOUS PUMP INFUSIONS FOR EXTRADURAL ANALGESIA DURING LABOUR

Sir,—The use of pump infusions for continuous extradural analgesia during labour is gaining in popularity. Several excellent articles have outlined the basic pharmacological principles and clinical guidelines of the technique [1–3]. I would like to point out, however, that patient studies generally follow a rigid regimen, whereas clinical work should be more flexible. For example, Abboud and colleagues [2] used 0.125 % bupivacaine 14 ml h⁻¹ alone, while Li, Rees and Rosen [3] used 10 ml h⁻¹ and 8–10 ml "top-ups" of 0.125 % bupivacaine if analgesia was inadequate. Both induced excellent analgesia. However, Li, Rees and Rosen [3] had an exceptionally (and to me unacceptably) high incidence of muscle weakness, with almost 80 % able to flex the ankle only or nothing at all. Such an incidence of muscle weakness is unavoidable if one uses a fixed regimen as in the above studies, but is almost entirely avoidable if a flexible schedule, suited individually to each patient, is used. Our clinical guidelines for infusion pump extradurals are as follows:

1. Establish a good block at the onset. The pump infusion will not make up for a poor extradural.
2. Patients vary. Start with rates of 10–14 ml h⁻¹ (if using 0.125 % bupivacaine) and vary the rate to suit patient response. One patient (my wife) had excellent analgesia with minimal motor weakness, with almost 80 % able to flex the ankle only or nothing at all.
3. If motor block is significant, stop the infusion until motor power returns, then restart the infusion.
4. If pain returns, add a reasonable top-up then continue the infusion.
5. Be flexible. Only journal articles have to follow a rigid regimen!

With these guidelines we can provide excellent analgesia with minimal motor weakness. As already stated in this forum [4], fixed regimens do not satisfy all clinicians. They also do not satisfy all patients.

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CONTINUOUS FLOW VENTILATORS IN THE ICU

Sir,—We were delighted to read the paper by Mecklenburgh and colleagues [1], which is of great clinical interest to...
anaesthetists in intensive care units. The authors have shown that the increased work of breathing caused by the higher inspiratory resistance of the IMV circuit of the Kontron 3100 ventilator delayed the weaning of the patient from the ventilator. We would like to point out that the use of ventilators, like the Bird IMV, which are capable of delivering continuous flow in the IMV mode, might be more advantageous in the clinical circumstances described by the authors.

The IMV Bird is fitted with a demand CPAP system which allows the installation of an automatic baseline compensator which, among many others functions, reduces the fluctuations in the baseline pressures observed whenever inspiratory demand exceeds inspiratory flow. This, therefore, significantly reduces the work of breathing. This system is capable of giving inspiratory flow that is proportional to the inspiratory effort without altering the baseline pressures. Further, the Bird CPAP system was devised to reduce the work of breathing during the IMV mode, especially in the presence of PEEP. Most ventilatory devices provide a regulated positive end-expiratory pressure. However, during IMV procedures with PEEP, the patient may have to create substantial pressure gradients to entrain gases from the breathing circuit. This may significantly increase the work of breathing, with resultant increase in oxygen consumption and carbon dioxide production—as might have happened in the case described by the authors. We do not know if the authors were using PEEP during weaning, which might have contributed to the difficulty in weaning. When all adjustments are made in the IMV mode in the Bird IMV system (including nebulization), by an additional flow, there could be a continuous flow in the breathing circuit which might reduce the inspiratory resistance and, hence, work of breathing. The resistance of the humidifier may not be important in these circumstances.

Figure 2 of Mecklenburgh and colleagues shows an interesting finding. The slopes of A, B and C were similar, but that of D (alternate IMV) was less steep at higher flows compared with those of the ventilator circuits. Although the resistance of the ventilator alone (C) at lower flow rates was close to that of the IMV circuit, at a higher flow rates the difference between them appears to be substantial. This might suggest that the alternate IMV system was capable of delivering the higher flows required at higher inspiratory efforts more easily than the Kontron 3100 ventilator system used (inspiratory demand is better met by the inspiratory flow in the alternate IMV circuit than the ventilator). Therefore, the breathing characteristics of the alternate IMV system make it a more efficient circuit in the IMV mode than the ventilator itself. It would have been very interesting it see if the introduction of the humidifier to the alternate IMV system would increase the total resistance of the alternate IMV circuit by an anticipated 0.6 kPa or value less than 0.6 kPa.

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