Prenatal preparation of patients in training the use of regional anaesthetist and surgical team should prevent delay in starting a regional technique. Furthermore, coordination between the obstetricians, residents and nursing staff are required in recovery room for the patients recovering from regional anaesthesia.

An experienced attending anaesthetist is present in the labour and delivery suite at all times. Almost exclusively we use a single bolus dose extradural technique, utilizing an Epi-Sure needle. Whenever continuous extradural block is performed, a Tuohy needle is used and it takes a few minutes longer than the single injection technique. We use disposable sets which are readily available in all labour and delivery rooms. Presently we are using 0.5% bupivacaine and find that surgery can be started within 15 min of injection, which is approximately the amount of time it takes to start a Caesarean section in all but the few most urgent cases. While we are performing the extradural block, surgeons are scrubbing and nurses are setting up the instruments, so that no time is wasted after the block is established. In the extremely rare case of an accidental intravascular injection a rapid delivery, if necessary, can be performed, since the surgical team is in attendance.

General anaesthesia is used for the parturients with severe fetal distress, hypotension, documented coagulation disorders, progressive neurological disease and technical difficulties in performing the extradural block. Patient refusal is a very rare problem because of prenatal explanation and preparation of parturients for extradural anaesthesia. Furthermore, our high rate of extradural anaesthesia is also a result of overwhelming acceptance and support by the obstetricians, residents and nursing staff. Because of their cooperation, we have been able to communicate effectively with patients from diverse backgrounds, including some who speak no English or are mentally handicapped. Almost all of our patients are completely satisfied with the extradural anaesthesia and request it for their subsequent Caesarean section and even for non-obstetric surgery.

We feel that, with adequate training, extradural anaesthesia for Caesarean section is both easy and safe and can be performed only slightly less quickly than general anaesthesia when a single injection technique is used. Furthermore, co-ordination between anaesthetist and surgical team should prevent delay in starting a Caesarean section under extradural block. Also important is the prenatal preparation of patients in maximizing the use of regional anaesthesia.

### Table I. Time course of 10 elective Caesarean sections performed under single injection extradural block

<table>
<thead>
<tr>
<th></th>
<th>Start of anaesthesia</th>
<th>Injection of bupivacaine</th>
<th>Skin incision</th>
<th>Delivery of infant</th>
<th>End of case</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean (min)</td>
<td>0</td>
<td>6.6</td>
<td>18.2</td>
<td>30</td>
<td>61</td>
</tr>
<tr>
<td>Range (min)</td>
<td>0</td>
<td>5-10</td>
<td>15-25</td>
<td>20-39</td>
<td>46-85</td>
</tr>
</tbody>
</table>

Sir,—Thank you for the opportunity of replying to this interesting letter.

Conduction anaesthesia only appears more difficult than general as British anaesthetists are, on the whole, less experienced with regional techniques. Clearly, difficulty diminishes with experience.

The times quoted by Drs Sosis and Ahmad from induction to delivery in table I make a convincing case for the feasibility of using extradural block for Caesarean section in everyday hospital practice. These figures should further increase the doubts about the necessity of routinely taking some hours from induction of extradural block to delivery in elective Caesarean section.

One must question the virtue of the one-injection extradural technique. The induction to delivery interval is not substantially longer in our survey in patients having elective Caesarean section, all of whom had extradural catheters inserted. The presence of the catheter can increase the flexibility of the technique.

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REFERENCE

Fig. 1. The modified system. 1 = Air break; 2 = negative pressure relief valve; 3 = transfer tubing; 4 = connection to extractor system.

potential hazard and further enhances the safety of the system. However, it should not be an alternative to adequate maintenance, cleaning and regular testing as recommended by the manufacturers and by Mostafa and Natrajan (1983). The modification is now commercially available as an optional part from B.O.C., Medishield Ltd, Harlow.

S. M. MOSTAFA
B. YATE
Birmingham

REFERENCES

ATRACURIUM IN A PARTURIENT WITH ATYPICAL CHOLINESTERASE

Sir,—Atracurium is rapidly metabolized by Hoffmann elimination and by ester hydrolysis which is independent of plasma cholinesterase activity (Hughes and Chappie, 1981). In man, the neuromuscular blockade produced by atracurium is not prolonged when the cholinesterase activity is markedly decreased by organophosphorous poisoning (Baraka, Chaya and Abu Jaude, 1984). Also, in vitro experiments have shown that the rates of breakdown of atracurium are not different when the drug is incubated in normal plasma or in plasma obtained from genetically deficient homozygote patients with virtually no plasma cholinesterase activity (Merrett, Thompson and Webb, 1983). The following case report shows the effect of atracurium in a parturient having atypical plasma cholinesterase activity.

The parturient, a 32-year old female, was scheduled for Caesarean section. Two years previously she aborted at 12 weeks of pregnancy, and a dilatation and curettage was performed under general anaesthesia using thiopentone 250 mg and suxamethonium 100 mg. This was followed by prolonged neuromuscular blockade which lasted for 30 min. On account of this history, the plasma cholinesterase and dibucaine number were estimated before the Caesarean section. The plasma cholinesterase activity was 1.87 u.ml\(^{-1}\) (normal value 4.12 ± 1.44 u.ml\(^{-1}\)) and dibucaine number 68, suggesting a heterozygote enzymatic activity.

The patient was premedicated with glycopyrrolate 0.4 mg i.m., and anaesthesia was induced with thiopentone 4 mg.kg\(^{-1}\). The ulnar nerve was stimulated at the wrist and the twitch response observed. A bolus of atracurium 0.4 mg.kg\(^{-1}\) was injected i.v. Complete neuromuscular blockade was achieved after 90 s, when tracheal intubation was performed easily. Anaesthesia was maintained with nitrous oxide in oxygen. The newborn was delivered 10 min following the injection of atracurium, cried immediately and had an Appgar score of 8 at 1 min and 10 at 5 min.

Neuromuscular transmission started to show recovery 20 min following the injection of atracurium and showed 50% recovery by the end of surgery, which lasted 40 min. Residual neuromuscular blockade could be completely antagonized by a relatively small dose of neostigmine 0.025 mg.kg\(^{-1}\) mixed with atropine.