than 72 h for the clinical condition to resolve. Third, the peak concentration measured (4 mg litre\(^{-1}\)) is large, but is noted not infrequently in kinetic studies of regional anaesthesia with bupivacaine, with unremarkable effects. In this regard, the authors may have been led astray by the opinion they received on plasma concentrations from the New Cross Poisons Unit. To indicate that plasma concentrations of bupivacaine should not exceed 1 mg litre\(^{-1}\) is, I am afraid, a pronouncement without foundation.

J. A. W. WILDSMITH
Edinburgh

REFERENCE

Sir,—We were interested in the paper by Drs Dunne and Kox, describing symptoms of overdosage in a patient receiving an extradural infusion of bupivacaine [1]. They advised on the recommended dosage for such infusions and suggested measuring plasma concentrations during extended infusions.

The authors did not comment on whether or not a loading dose was given to produce an initial measurable block, pain relief or improvement in ventilation. The purpose of a loading dose is to create an initial neuronal block, which, being followed by an infusion, maintains the effective concentration of local anaesthetic within the neurone. Attempting to initiate a block using an infusion alone would result in a very slow increase in concentration at neuronal level and hence, an extremely slow onset of block.

Theoretically, the rate of removal of local anaesthetic solution from the extradural space is such that a block may never be achieved within non-toxic plasma concentrations using a "build-up" infusion technique of this nature.

Had an adequate block been established in the first instance with a suitable loading dose, it would then have been possible to ascertain whether or not subsequent failure of the block was caused by regression of the block or outward migration of the catheter. Tachyphylaxis should have been considered also as a cause of failure in an infusion of long duration, especially where pain has not been adequately captured.

Interestingly, they saw no cardiovascular changes. In a volunteer study giving i.v. bupivacaine, Scott and colleagues [2] observed measurable cardiovascular changes in the presence of mild neurological symptoms and low plasma concentrations of bupivacaine. Monitoring the cardiovascular system and the degree of analgesia would be a cheaper and easier alternative to measuring plasma concentrations of bupivacaine.

G. JONES
M. LOGAN
Edinburgh

REFERENCES

ATROPINE AND THE TEST DOSE
Sir,—Narchi and colleagues stated: "To be useful, a test dose must be both specific and sensitive. The lack of specificity has already been demonstrated in parturients who exhibited false positive responses to an adrenaline test dose (increases in HR [heart rate] after injection of bupivacaine without adrenaline)" [1]. To support this statement, they cited Cartwright, McCarrol and Antzaka [2]. Evidently they were unaware that the validity of that study was questionable. Its methodology was based on 3 ml of solution being injected through plastic tubing (catheter) at 1 ml s\(^{-1}\), which is impossible [3].

As to sensitivity, Narchi and colleagues found that atropine 0.5 mg i.v. 5 min before "a test dose containing 2% lignocaine 3 ml and adrenaline 15 \(\mu\)g was not very sensitive for detecting intravascular injection, as moderate or false negative responses occurred frequently" [1]. Should this prohibit them from administering a test dose on the basis that "... atropine 0.5 mg is used routinely in our institution before extradural block is performed, in order to prevent bradycardia"? [1]. Why not: 1) administer the test dose; 2) take the time (2 min) to evaluate it; 3) give 0.5 mg of atropine i.v. and 4) then immediately follow it with the therapeutic dose of the local anaesthetic? Doing so would still give i.v. atropine 5 min to suppress "vagal bradycardia". When a therapeutic dose of a local anaesthetic is injected into the lumbar area of the extradural space, it seldom results in a bradycardia until 5 min or more elapses. Therefore, would not administration of atropine in the suggested sequence allow "the best of both worlds", namely, ruling out the possibility of a systemic toxic reaction or a total spinal anaesthetic by the test dose and avoiding a vagal bradycardia by i.v. atropine?

D. C. MOORE
Seattle

REFERENCES

Sir,—Thank you for giving us the opportunity of replying to Dr Moore's letter concerning the interactions between i.v. atropine and subsequent i.v. injection of a test dose containing adrenaline 15 \(\mu\)g [1]. We totally agree with the fact that the rate of injection through a standard extradural catheter cannot exceed 0.2 ml s\(^{-1}\). Nevertheless, in our daily practice, a test dose may be administered through either the catheter or the Tuohy needle. Thus, in the latter situation, the rate of the injection (1 ml s\(^{-1}\)) in our study may correspond to the "reality". Indeed, the "standard test dose" described by Moore and Batra [2] mentioned a rate of injection of 1 ml s\(^{-1}\), corresponding to an injection through the Tuohy needle.

The administration of atropine increased the sensitivity of the test dose from 83 % to 91 %, which implies that it does not conceal but improves, even if moderately, the response to adrenaline. Moreover, the majority of vagal attacks occur during the extradural puncture, whereas those which occur following the administration of the therapeutic dose of local anaesthetics remain exceptional (as pointed out by Dr Moore). Thus there is no need to administer atropine in the sequence advised by Dr Moore. The test dose is used mainly to prevent vagal attacks occurring during extradural puncture.

P. NARCHI
Paris

REFERENCES

POTASSIUM IN THE PERIOPERATIVE PERIOD
Sir,—Dr Vaughan's review of potassium in the perioperative period [1] advocates immediate hyperventilation in the management of an acute increase in plasma potassium (as identified from the ECG) after suxamethonium, on the basis that alkalosis encourages potassium ions to enter cells. From investigations using intermittent blood sampling [2], this would appear correct.

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