CORRESPONDENCE

HYPOTENSIVE AGENTS: AN ANIMAL MODEL

Sir,—I query the choice of the greyhound by Sury and colleagues [1] as an animal model for the cardiovascular actions of hypotensive agents. The authors cite the greyhound’s compensatory mechanisms and their similarity to healthy young adults. There are certainly several reasons why the greyhound is an attractive experimental animal, including species homogeneity, adequate size, lack of body fat, large thorax and conduit blood vessels for instrumentation.

However, the characteristics of the greyhound cardiovascular system compared with those of the mongrel are well documented, and include higher mean arterial pressure and cardiac index with a lower calculated peripheral vascular resistance in the unanaesthetized animal, differences in haemodynamic responses to i.v. anaesthetic induction, lower plasma renin concentrations in anaesthetized and non-anaesthetized animals, together with multiple differences in central and regional pulsatile haemodynamics [2]. The ability to compensate for perturbations in arterial pressure in the intact greyhound is not significantly different from that of mongrel controls of comparable age and weight. Differences in regional baroreceptor haemodynamic control are confined to skeletal muscle [3]. In many ways, as an experimental animal model, the greyhound resembles the early phase of benign human essential hypertension.

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REFERENCES

Sir,—Thank you for giving us the opportunity to reply to Dr Bagshaw’s letter. His suggestion that our experimental model resembles the early phase of benign essential hypertension is based on experimental work which compared the cardiovascular characteristics of greyhounds and mongrels in the non-anaesthetized, chronically instrumented state [1]. Our greyhounds were anaesthetized, but their resting mean arterial pressure of 106 mm Hg was not dissimilar to that of their mongrel dogs. Furthermore, we see no reason not to use the greyhound model if “the ability to compensate for perturbations in arterial pressure in the intact greyhound is not significantly different from that of mongrel controls of comparable age and weight” [1]. Our previous experimental work on the cardiovascular effects of induced hypotension used greyhounds and formed a valuable basis for comparison [2].

Finally, we wish to add that, in this country, it is understood that animals must be obtained from a reputable supplier or specially bred for experimental purposes. For this reason mongrels would, simply, not have been available to us.

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REFERENCES

SPINAL ANAESTHESIA WITH BUPIVACAINE

Sir,—We would like to comment on the article by Mitchell and colleagues [1] on effects of posture and baricity on spinal anaesthesia with 0.5% bupivacaine 5 ml. Referring to a study by Chambers, Edström and Scott [2], the authors state that it has been shown that the plain solution of 0.5% bupivacaine is less suitable for abdominal surgery than a hyperbaric solution of bupivacaine. On the basis of their own results, Mitchell and co-workers also state that using 5 ml instead of 3 ml makes the plain solution of bupivacaine more suitable for abdominal surgery.

What Chambers and co-workers demonstrated is that, under the conditions of their study and methodology, the cephalad spread of the plain solution was too low for abdominal surgery. The results of Chambers and co-workers certainly do not warrant the conclusion that the plain solution of 0.5% bupivacaine is less suitable for abdominal surgery. Kalso, Tuominen and Rosenberg [3] showed that, with the patients sitting for 2.5 min after the intrathecal administration of 3 ml, the use of plain 0.5% bupivacaine resulted in increased cephalad spread. Indeed, it has been shown that, provided the patients receiving the plain solution are kept sitting for 2 min or more, the resultant level of sensory blockade after 3 ml is at least the same as when a hyperbaric bupivacaine solution is used [4–6].

Mitchell and colleagues, in their discussion, failed to refer to this earlier work, and merely demonstrated that what has already been shown for 3 ml also applies for 5 ml of 0.5% bupivacaine.

R. STIENSTRA
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Sir,—Thank you for the opportunity to comment upon the letter by Drs Stienstra and van Poorten. We agree that we should have been more specific in our comments regarding the earlier work by Chambers, Edström and Scott [1], in that they did not include a “sitting” group in their study with 0.5% plain bupivacaine 3 ml. However, the results of our current study with 5 ml of plain solution did not show any difference in eventual height of block between the “sitting” and “supine” groups, although the onset of the block was faster in the “sitting” group.

We did not have the opportunity to see the paper by Stienstra and van Poorten, which was published after our manuscript was prepared. However, we would point out that this work was performed on a relatively elderly population, while our study and that of Chambers were performed on a much younger population. Care is therefore required in comparing results between such disparate groups, as age is known to be a significant determinant of spread of block in spinal anaesthesia with 0.5% plain bupivacaine [2, 3]. We would also point out that, in this study, the cephalad spread of the block was assessed only up to 20 min. This may not represent the ultimate extent of spread. We assessed our patients to 30 min.

Therefore we maintain that, if a volume of 0.5% bupivacaine 3 ml is to be used in abdominal surgery in younger patients, more reliable results will be obtained with the hyperbaric preparation. If the plain solution is chosen, we would elect to use a volume of 4–5 ml.

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REFERENCES

TEACHING FIBREOPTIC INTUBATION

Sir,—Dr Ovassapian and his colleagues [1] have described a programme for teaching clinicians the skills required to intubate the trachea using a flexible fiberoptic laryngoscope. Although the programme is effective, Dr Ovassapian has identified several disadvantages inherent in the system, including a considerable amount of time required by instructors and trainees, and the need to obtain informed consent from patients who volunteer to be “simulators.” An additional disadvantage not identified by the authors is the risk of injury to the patient volunteers during exposure of the epiglottis and vocal cords by relatively unskilled endoscopists. Also, their programme does not include passage of the fiberoptic laryngoscope through the vocal cords, or advancing the tracheal tube into the trachea of the patient simulator. Ideally, these steps should be practised before using this skill on patients in the clinical setting.

We have developed a teaching programme for fiberoptic tracheal intubation which avoids the problems outlined by Dr Ovassapian. The programme includes a demonstration of the fiberoptic laryngoscope and a description of the intubation technique; individual practice using an intubating mannequin; and finally, fiberoptic tracheal intubation of an anaesthetized, spontaneously breathing pig.

The pig was chosen as the model for this teaching programme because, whilst tracheal intubation in this species is difficult, the airway anatomy resembles that of the human [2]. The mouth is long and narrow; the larynx is small; and the presence of pharyngeal diverticuli makes recognition of the anatomy challenging. In addition, pigs are susceptible to laryngospasm. Therefore, successful fiberoptic intubation of the pig requires recognition of anatomical landmarks, overcoming complications such as excessive salivation and laryngospasm, and manipulation of the fiberoptic laryngoscope through the vocal cords before advancing the tracheal tube into position.

This model very closely resembles the clinical situation without the disadvantages described. Time commitments are reduced for instructors and students because several people can be taught simultaneously. Working in this non-stressful environment, students quickly develop confidence in their ability to control and manipulate the fiberoptic laryngoscope before attempting the technique on a patient in the operating room. The advantages are that the anaesthetized pig model is more realistic than use of an intubating mannequin [3]; it eliminates the need for patient volunteers, informed consent is not required, and inadvertent patient injury cannot occur during the practice session.

Use of this model to teach fiberoptic intubation has met with considerable enthusiasm within our Department and objective evaluation of its effectiveness is underway. It appears to be an efficient and effective alternative to the use of volunteer patient “simulators” for teaching this important skill.

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