Hypertension and perioperative risk

Editor—I read the review¹ and associated editorial² about hypertension with considerable interest and was informed and educated by both. However, my concerns regarding preoperative hypertension do not only extend to the patient, but also to me!

Thus, for a risk-averse anaesthetist, the presence on the list of a patient whose blood pressure is elevated may lead to increased anxiety and push the anaesthetist towards, or over the top of, their Yerkes—Dodson curve.³

I may not always be so risk averse; but I do feel that anaesthesia for elective procedures should be as risk free as possible. Surely the preemptive correction of minor degrees of hypertension is more appropriate than the use of invasive monitoring and high dependency care in these cases?

In the light of increasing public awareness of the problems of obesity and alcohol abuse, should advice on weight loss and reduction of alcohol consumption (and their effects on blood pressure⁴) not only be part of every hypertensive patient’s preoperative assessment, but also be issued to them in surgical outpatient clinics?

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Editor—We are most grateful for the opportunity to reply to Dr Palmer’s letter. He raises two points. The first is to suggest that the correction of minor degrees of hypertension before surgery is more appropriate than the use of invasive monitoring and high dependency care in these cases. For admission blood pressures between 120/80 mm Hg and 180/110 mm Hg we were unable to find any evidence of increased perioperative risk. We accept that it is biologically plausible that such blood pressures may confer a small increase in risk. However, this effect is beyond the resolving power of currently available studies, and major cardiovascular risk factors such as heart failure and known ischaemic heart disease are more important indicators of perioperative risk. We have tried to produce guidelines that are pragmatic and clinically useful and, on this basis, we felt unable to recommend deferring surgery to control a risk whose existence we cannot demonstrate.

For admission blood pressures persistently above 180/110 mm Hg, the position is less clear. While there are no data to support an increased incidence of adverse events in this group of patients, the work of Prys-Roberts and colleagues does suggest that patients with very high blood pressures display a greater fall in blood pressure at induction of anaesthesia and are more prone to intraoperative myocardial ischaemia.⁵ It is for patients with blood pressure elevated to this level that we suggest that anaesthesia and surgery should be deferred where possible to allow the blood pressure to be controlled and, where this is not possible, the use of invasive monitoring and high-dependency care may be appropriate.

We would emphasize that we seek to offer guidelines to aid the clinician, not edicts to ordain patient care. There will certainly be circumstances in which persistently elevated admission blood pressure may, of itself, be a cause for concern. Refractory hypertension in a young patient, suggestive of secondary hypertension, is one such circumstance.

Dr Palmer’s second point, on the role of the anaesthetist and surgeon in the primary and secondary prevention of cardiovascular disease, is very well taken. Smoking, obesity and alcohol abuse are difficult problems to tackle but, as physicians concerned with the well being of the whole patient, they certainly fall within our remit.

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Remifentanil is too potent to be given by bolus

Editor—We read with interest the study evaluating bolus injection of remifentanil in spontaneously breathing human volunteers by Egan and colleagues.¹ Using a randomized, double-blind, placebo-controlled, dose-escalation, crossover study design, a total of 64 healthy subjects received remifentanil or placebo by bolus injection (1–3 s) in a fixed unit dose separated by a 1 h washout period. Groups of six subjects were studied at the initial dose of 25 µg and at subsequent doses of 25 µg increments until a total of four out of the six subjects in any one group had experienced respiratory depression, or the maximum dose of 250 µg had been reached. From their extensive investigation, the authors were able to conclude that bolus injection of remifentanil would be potentially safe and effective in clinical situations, despite the fact that a number of the volunteers in

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³Yerkes RM, Dodson JD. The relation of strength of stimulus to mental processes. J Comparative Neurol Psychol 1908; 18: 459–82

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their study had what can be considered serious respiratory depression and apnoea. Unsurprisingly, these events were more evident in the elderly group, which overall received lower doses of remifentanil; however, some younger age group subjects also experienced respiratory depression, again at a relatively low dose of remifentanil. The authors’ definition of an adverse event was related to the respiratory intervention scale, which, rather generously in our opinion, defines respiratory depression as an $S_{pO_2} < 85\%$ for $>5$ s.

The UK data sheet indicates that remifentanil may be administered as a bolus of 0.5–1.0 $\mu g \cdot kg^{-1} \cdot min^{-1}$ over not less than 30 s during induction of anaesthesia. Even under these controlled conditions, this practice has not found wide acclaim because of the associated incidence of hypotension and bradycardia.2–3 Where remifentanil is used, a titrated infusion is increasingly preferred. A bolus of remifentanil is not recommended in spontaneously breathing anaesthetized patients or in sedated ICU patients. Indeed, the product licence for remifentanil in the ICU stipulates remifentanil infusion for mechanically ventilated patients only. Whereas we would advocate use of a remifentanil infusion in a variety of settings and different patient groups, particularly in spontaneously breathing patients where lack of accumulation and titratability can make it a superior choice of analgesia, its use in bolus form is unpredictable and associated with a host of uncontrollable and undesirable effects.

Overall, the conclusions reached by Egan and colleagues are not reflective of their study results, and should do little to convince the readership that bolus administration of remifentanil is a safe and effective means of analgesia in spontaneously breathing patients.

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Editor—We thank Dr Mallick and colleagues for their comments regarding the use of remifentanil by bolus injection, as discussed in our manuscript.1 They correctly underscore the potential dangers of the technique.

As noted in our manuscript, the primary side-effect of concern in association with remifentanil bolus injection in spontaneously ventilating patients is respiratory depression (and apnoea). Rapid onset opioids like remifentanil are especially troublesome in this regard because the carbon dioxide ventilation–response curve (i.e. the relationship between minute volume and $P_{aCO_2}$) is altered before the patient’s $P_{aCO_2}$ rises sufficiently to sustain ventilatory drive.4

Our manuscript was not intended to minimize these risks. On the contrary, the study was intended to provide a scientific foundation to begin understanding and characterizing these risks. While the respiratory depression observed in all subjects in our study was easily managed with simple clinical manoeuvres (i.e. prompting to breathe and the administration of supplemental oxygen), some subjects, particularly older ones, exhibited substantial respiratory depression even at low doses. The degree of respiratory depression we observed cannot be considered trivial by any means.

As noted in the original manuscript, from a clinical perspective, the ‘take home’ messages from our study are: (i) that bolus dose remifentanil does indeed produce substantial respiratory depression; (ii) that this respiratory depression is highly variable and is typically more serious in older subjects; (iii) that the respiratory depression can be managed with simple clinical manoeuvres; (iv) that practitioners should be expert at the administration of remifentanil by infusion before attempting bolus injection techniques; and (v) that practitioners administering remifentanil by bolus injection should be experts at the recognition of inadequate ventilation and airway management.

At least in part, our investigation was motivated by the increasing use of bolus dose remifentanil in the USA. Bolus injection of remifentanil in various clinical settings, for example analgesia for eye blocks, awake laryngoscopy, and shock wave lithotripsy,5–8 is commonplace. Our study aimed to better understand and define this practice.

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8 Sa Rego MM, Inagaki Y, White PF. Remifentanil administration during monitored anesthesia care: are intermittent boluses an effective alternative to a continuous infusion? Anesth Analg 1999; 88: 518–22

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Intraoperative i.v. morphine reduces pain scores and length of stay in the post anaesthetic care unit after thyroidectomy

Editor—Postoperative pain after thyroid surgery may be important especially in the first few hours after surgery.1–4 The analgesic efficacy of different medications including non-steroidal anti-inflammatory drugs possibly in combination with paracetamol, oral opioids and regional and local anaesthesia, have been described after thyroidectomy.1–6 We hypothesized that intraoperative i.v. morphine might influence the immediate postoperative pain scores, opioid-related side-effects and length of stay in the postanaesthetic care unit (PACU).

After ethical committee approval, 60 consenting adults ASA I–II undergoing elective total thyroidectomy for multinodular goitre were enrolled into the study. Patients were randomized into two groups: Morphone Group ($n$=30), and Control Group ($n$=30). All patients had general anaesthesia with propofol 2.5–4 mg kg$^{-1}$, and sufentanil 4–5 $\mu g \cdot kg^{-1}$. Tracheal intubation was performed without using a neuromuscular blocking agent, and anaesthesia was maintained with isoflurane/nitrous oxide/oxygen.

After dissection of the first thyroid lobe, patients received acetaminophen 1 g before administration of the treatment, which