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Correspondence

Preoperative screening for obstructive sleep apnoea – one death is too many

We read with interest the editorial "Preoperative screening for obstructive sleep apnoea – are we losing sleep over nothing?" by JA Loadsman[1] and the response by DW Blake et al[2]. We agree with Dr Blake that the preoperative assessment of obstructive sleep apnoea (OSA) and airway risk factors is clinically important, which may help us to identify patients who should receive modified airway, oxygen and analgesia management in immediate postoperative care.

We do not agree, however, with some of Dr Loadsman's viewpoints in his initial editorial. OSA is a highly prevalent disease. The prevalence is 17 to 26% of men and 9 to 28% of women with an apnoea-hypopnoea index ≥5 as OSA diagnosis criteria; and 7 to 14% of men and 2 to 7% of women with apnoea-hypopnoea index ≥15 as OSA diagnosis criteria[3]. Obesity is significantly associated with OSA[3]. With the trend of increasing prevalence of obesity and ageing of the population, the incidence of clinically significant OSA is expected to increase. It is estimated that 82% of men and 93% of women with OSA are not diagnosed at present. The all-cause mortality is higher with increase of severity of OSA[4]. Also, there is accumulating evidence that OSA patients have an increased incidence of perioperative adverse events following surgery. Assessing surgical patients for OSA in the preoperative clinic would not only improve perioperative safety but would it also provide another pathway for OSA patients to get the therapy they need. This would give a new dimension to anesthesiologists' role as perioperative physicians. We refer patients with undiagnosed angina, uncontrolled hypertension, poorly controlled diabetes and smoking cessation. Why not OSA?

Identifying patients at risk of OSA does not mean that we have to follow the overly cautious guideline. By combining a simple questionnaire, such as the STOP questionnaire[5], with a simple portable device such as a high resolution nocturnal oximeter[6], we can detect those patients with very high probability of OSA in a convenient and inexpensive way. Incorporating preoperative screening information with observation in the post-anaesthesia care unit on recurrent desaturation would provide sufficient information to guide postoperative management.

As Dr Loadsman indicated, there are practical obstacles to perioperative research in OSA, as serious postoperative adverse events are relatively rare, despite the high prevalence of sleep-disordered breathing[2]. Patients can have cardiac or respiratory events due to undiagnosed severe OSA, even if they have regional anaesthesia. It is possible that patients with a high apnoea-hypopnoea index (70 to 80) may be more likely to have respiratory events. There is a need for the academic anaesthesia community to focus research in this area, as one death may be too many.

F. Chung
P. Liao
Toronto, Ontario, Canada

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Preoperative screening for obstructive sleep apnoea – one death is too many – Reply

While disagreeing with my point of view, Chung and Liao[1] reiterated the evidence that actually supports it – the fact that obstructive sleep apnoea (OSA) is highly prevalent. As discussed in my editorial[2], this means mathematically that the overall risk is small and whatever it is we are already doing for the overwhelming majority of OSA sufferers is working. That is not to say there is *no* risk, of course, but those for whom the risk is *significant* (the morbidly obese and those with anatomically disastrous airways, for example) are readily identifiable with the

naked eye. Preoperative assessment *is* necessary, but those at greatest risk don't need specific screening questionnaires and overnight oximetry to tell us who they are.

Let's say we screen everybody to the extent suggested by Chung and Liao[1], or Blake and Donnan[3] (i.e. screening and overnight oximetry for patients thus identified) and let's assume that the screening tool is reasonably good for the intended purpose. Conservatively, around 10% of all patients (28% using Chung et al's data[4]) will require preoperative overnight oximetry. Given that the annual number of surgical procedures is a bit over 10% of the population in developed countries (Barry Baker, personal communication), that's at least 200,000 overnight studies a year in Australia, 300,000 in Canada and 3,000,000 in the USA – a lot of pulse oximetry recorders as well as staff to organise the studies and assess the results. In my hospital alone, we'd have to arrange a minimum of 1300 overnight studies a year. Many of these patients come from isolated rural areas and are assessed only the day before their surgery. The overall cost, time and practicality implications of this proposed activity are very substantial indeed.

Even if we could do all that, will it change our intraoperative airway management? No. We do that quite well anyway. Will it change anything we do in the recovery room? No. *All* patients are monitored extremely closely already, and problematic patients declare themselves quickly and are dealt with appropriately. Will it change our analgesic prescription? It shouldn't, because we should already be doing everything we can (peripheral nerve blocks, multimodal analgesia, etc) for *all* patients to limit the use of opioids. Will it change anything we do beyond the recovery room? Almost certainly not, simply because we don't have the monitored high-dependency resources necessary to deal with that number of patients. We therefore have to be very selective and, in the end, who is actually going to get the "modified airway, oxygen and analgesia management in the immediate postoperative period" that both Blake and Donnan[3] and Chung and Liao suggest[1]? The 130 kg bloke who looks like a bulldog, that's who, so we're back to square one.

It's interesting to note that Chung has recently proposed the *elimination* of preoperative testing in ambulatory surgery[5], even when indicated by specific clinical features or pre-existing medical conditions, because it costs money and doesn't change anything. To exhort widespread preoperative OSA screening despite no evidence of efficacy or outcome benefit seems, therefore, somewhat inconsistent.

J. A. LOADSMAN
Sydney, New South Wales

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Relative hypotension in the beach-chair position: effects on middle cerebral artery blood velocity

I enjoyed reading the study by McCulloch et al, in which they sought to quantify the magnitude of the physiological insult during arthroscopic shoulder surgery in the beach-chair position[1]. However, I feel that the design of the study may have resulted in an overstating of the magnitude of the potential reduction in cerebral perfusion.

Their report compares cerebral haemodynamics in anaesthetised patients who are supine but have their pre-induction blood pressure (BP) levels reinstated with their haemodynamics while seated at 45 degrees with hypotension (systolic BP of 90 mmHg). The results show a 47% decrease in mean arterial pressure (MAP) at the auditory meatus and a 22% drop in middle cerebral artery blood flow[1].

When an awake person is standing or in an upright seated position, the arterial pressure at the auditory meatus is less than that at the heart or arm due to the effect of gravity[2]. For example, in a person 180 cm tall, the distance between the heart and the auditory meatus is about 35 cm. This would account for a pressure differential of 35 cm of water due to gravity, which is the equivalent of 26 mm of mercury. Thus, in this person, if the MAP is about 90 mmHg at the level of the heart, it will be about 64 mmHg at the level of the brain. In other words, the brain normally operates in a relative hypotension environment compared to the heart.

McCulloch et al describe a significant drop in MAP (47%) at the level of the auditory meatus when moving from the supine/pre-induction BP state to the beach-chair/hypotension state[1]. The magnitude of this