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## Reply to: should we use earlier and lower dose administration of sugammadex?

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Editor,

We read with interest the letter written by Mr Timko and Dr Mraovic.<sup>1</sup> Several limitations to the article we had previously written in your journal<sup>2</sup> have been highlighted and are very relevant.

Concerning the power of the study, safety studies indeed do require large numbers of patients to detect adverse events. However, our study was not a safety study but a pharmacodynamic study. Therefore, we did not recruit the large number of patients required for a safety study. Accordingly, regarding adverse events resulting from inadequate assessment of neuromuscular blockade in the recovery room, a register of unexpected life-threatening events was considered more relevant. Furthermore, the implementation of a randomised double-blind study based on a large number of patients would require significant human and logistic organisation and require, of course, very significant financial support.

The use of a train of four (TOF) ratio of less than 0.7 to define residual paralysis is indeed questionable. A threshold of less than 0.9 is indeed more stringent and provides greater safety.<sup>3</sup> Unfortunately, we do not have the data to determine whether patients had TOFs less than 0.9 and greater than 0.7. The definition of complete neuromuscular blockade reversal is subject to recent changes both in the definition of thresholds (0.9 or 0.95) and in the modalities of measurement, for example, use of TOF vs. central neuromuscular monitoring.<sup>4</sup>

The use of a lower dose of sugammadex is common practice in Belgium at the end of the procedure because of two main factors.

The first is that the use of sugammadex is fully charged to the patient regardless of the reasons for its use. By

reducing the doses, we could reduce the cost to the patient. The syringes might be prepared by the pharmacy or the manufacturer could modify its packaging.

The second is the undesirable effects of neostigmine, which can be significant for some patients (cardiac, bronchoconstriction or allergic effects).<sup>5</sup> For these reasons, some practitioners prefer to use sugammadex.

Finally, we can only support the recommendations made by the authors concerning the need for reliable, objective and reproducible neuromuscular monitoring. Many places still perform procedures without monitoring.<sup>6,7</sup> It is a basic safety feature that should be regarded as essential as oxygen saturation or heart rate measurement.

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## Stress levels in anaesthesiologists: explaining the extremes

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Editor,

We thank Bhakta *et al.* for showing interest in our article 'Chronic stress indicated by hair cortisol concentration in anaesthesiologists and its relationship to work experience

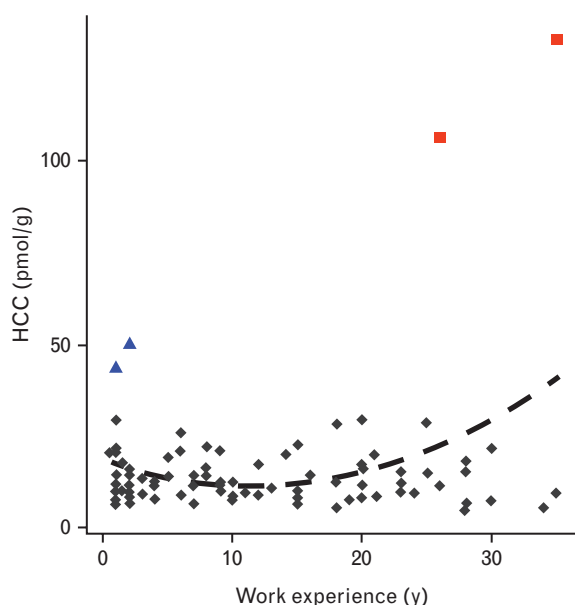
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and emotional intelligence<sup>1</sup> and for acknowledging the importance of occupational wellbeing of anaesthesiologists. In their letter,<sup>2</sup> Bhakta *et al.* wondered whether extreme forms of physical exercise or the use of relaxation techniques, such as yoga or mindfulness, were characteristic of the respective high and low values of hair cortisol concentration (HCC) that we observed.

In our study, we did neither collect data on participants' physical activity habits nor on other leisure-time activities. So, we cannot answer Bhakta *et al.*'s question directly. However, we agree that a more detailed look into the extreme values in our sample could be informative. We did not observe extremely low values of HCC; in fact, most participants displayed low HCC. However, two early-career consultants and two late-career consultants showed relatively high HCC values ( $>40$  pmol g<sup>-1</sup>; Fig. 1).

Both early-career consultants, who displayed high HCC, were under 40 and women. Both worked 80–90% of a fulltime job in a general or community hospital. They spent at least 80% of their worktime doing clinical work. Both had a partner and had children living at home. They reported a modest amount of negative home-work interference; nevertheless, for both, home-work interference was high compared with other consultants in our cohort

**Fig. 1** Hair cortisol concentration as a function of years of experience as a consultant anaesthesiologist



Blue triangles indicate the two early-career consultants described in this letter; red squares indicate the two late-career consultants.

( $\geq 87$ th percentile). Both were part of the 13% minority of our sample that did not work night shifts.

Both late-career consultants, who displayed high HCC, were over 60, one male, one female. Both worked fulltime in a general hospital and spent at least 80% of their worktime doing clinical work. Both had a partner; neither had children living at home. They reported small amounts of negative home-work interference (23–68th percentile). Both worked night shifts.

Although these characterisations are not uncommon for others in their age group, they are consistent with the possibility that high HCC levels in our sample stemmed from an intersection of work characteristics, home situation, career phase and physiological characteristics (e.g. sensitivity of the hypothalamic-pituitary-adrenal axis). That said, we cannot rule out Bhakta *et al.*'s novel hypothesis that high HCC values may also be linked to extreme forms of physical activity.

In their letter, Bhakta *et al.* suggest that a culture of extreme physical activity seems to be deeply embedded in the anaesthesia community. Perhaps they are correct: though we work in a different region than Bhakta *et al.*, we too know many anecdotes of anaesthesiologists who engage in extreme activities, such as scuba diving, sky-diving, (para)gliding, kitesurfing, racing or martial arts. Another example would be our Australian colleague Richard Harris: an experienced cave diver, who played a pivotal role in the 2018 Thailand cave rescue.<sup>3</sup> As these are anecdotes, rather than evidence of a pattern, we agree with Bhakta *et al.* that more research in this area is needed, to benefit anaesthesiologists' well being, which is important for patients as well.

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