Reviewer's report

Title: Somatosensory Evoked Potentials suppression due to remifentanil during spinal operations; a prospective clinical study

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Reviewer: Henning Hermanns

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In their manuscript, Asouhidou et al. report on the effect of high dose remifentanil infusion on somatosensory evoked potentials during spinal surgery in 10 patients. In their setting, high dose remifentanil induced significant suppression of amplitudes and insignificant prolongation of tibial SSEP.

Generally, the topic is of high interest, because intraoperative neuromonitoring can serve to reduce injury to neuronal tissue during surgery of the spine and anesthetics are known to affect the reliability of evoked potentials. Therefore, there is a great need to elucidate which anesthetic technique is most suitable for intraoperative neuromonitoring. In this context, it is worthwhile investigating the effect of remifentanil which is favoured by many clinicians when recording evoked potentials.

Yet, the study by Asouhidou and colleagues has some serious limitations that limit the informative value of the study and should be addressed by the authors.

Major Compulsory Revisions

1. In the methods part, the authors mention „recordings from the spinal and somatosensory cortical sites“, but only show data from cortical recording (p37). How about the potentials recorded spinally? Were these also suppressed? This would be of interest, because the effect of anaesthetic agents is more pronounced on synaptic transmission than on axonal conduction, and thus responses recorded from polysynaptic pathways are more affected by anaesthesia. This is the reason why cortical SSEP are more affected by anaesthesia than spinal cord and subcortical recordings (Banoub et al. Anesthesiology, 2003).

2. The authors should state that this is merely a prospective observational study, since there is no control group and thus no randomization.

3. For this kind of investigation, 10 patients form a relatively small collective. Could the number of patients be increased?

4. The authors should state where they see the novelty in their results, since the effect of remifentanil on SSEP has already been investigated in randomized studies, even with the use of various doses (Crabb et al. Br J Anaesth, 1996).

5. A dose response relation should be performed to define a remifentanil dose that does not significantly alter SSEP in this setting.
6. What was the protocol for significant reduction of amplitudes? A wake-up test? Did the marked reduction in amplitudes of over 50% presented in the figure, e.g. after 90 minutes (i.e. intraoperative!) lead to any changes in surgical procedure?

Minor Essential Revisions

7. The authors should give more detailed information on needle positioning concerning spinal and cortical electrodes

8. Please check/ rename figures correctly

9. Could the quality of figure 1 be improved? Additionally, there is no scale for x or y-axis. Moreover, according to the study protocol in the methods part, the time point “244 minutes civ remifentanil” is not within the observation period

10. Why were the patients hyperventilated (30-35 mmHg etCO2), when hypocapnia is known to affect SSEP? Additionally, why was ventilation adjusted to endexpiratory and not arterial CO2 when an arterial line was present?

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Acceptable

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

I declare that I have no competing interests.