Reviewer's report

**Title:** Thoracic Epidural analgesia on Oxygenation and pulmonary Shunt Fraction during One-lung Ventilation: A meta-Analysis

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**Reviewer:** Thomas Hachenberg

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Thoracic Epidural analgesia on Oxygenation and pulmonary Shunt Fraction during One-lung Ventilation: A meta-Analysis

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The authors compared the effects of thoracic epidural anaesthesia (TEA) on pulmonary gas exchange in patients undergoing one-lung ventilation (OLV) during lung resection surgery. In a meta-analysis five clinical studies with 9 comparisons in 321 patients were included in the analysis. The authors found that TEA decreased mean arterial pressure and increased intrapulmonary right-to-left shunt during OLV.

The study may be of interest for thoracic anaesthesiologists, however, I have major concerns with this manuscript.

1. The meta-analysis includes publications from 1996 to 2011 i.e. a time period of more than 15 years. Patient management has significantly improved during that time. Thus it is difficult to compare rather old studies with newer ones.
2. The study sample is fairly small, although the literature search covered more than 20 years. This is clearly not the fault of the authors of the present manuscript, however, there is no sense to perform a meta-analysis on rather poor studies.
3. Many studies included into the meta-analysis compare different techniques of general anaesthesia (e.g. total intravenous anaesthesia vs. balanced anaesthesia). If TEA has some effect on pulmonary gas exchange only studies with the same anaesthesiological management should be compared.
4. TEA was performed on different levels of the thoracic spine, which may have some impact on the extent of sympathetic block.
5. TEA was induced with different local anaesthetics (e.g. bupivacaine, ropivacaine, lidocaine etc.) with different pharmacological properties.
6. In addition, different opioids were used for TEA, which make a comparison of the studies difficult.
7. Finally, you fail to discuss the underlying causes of increased shunt during OLV in patients with TEA. Your explanation is focused on hypoxic pulmonary vasoconstriction (HPV), however, this mechanism is largely independent from sympathetic tone. Other possible effects such as ventilation-perfusion...
mismatching, the effects of regional perfusion on gas exchange, alteration of lung blood flow secondary to cardiac output or alveolar pressure are insufficiently considered.

8. Your recommendations are poorly substantiated by the results of your study.
9. The manuscript needs a complete and thorough linguistic revision.

**Level of interest:** An article of insufficient interest to warrant publication in a scientific/medical journal

**Quality of written English:** Not suitable for publication unless extensively edited

**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