Reviewer's report

Title: Role of Potassium and Calcium Channels in Sevoflurane-Mediated Vasodilation in the Foeto-Placental Circulation.

Version: 1 Date: 10 April 2009

Reviewer: Paul Pagel

Reviewer's report:

General Comments

The authors examined the role of Ca++- and ATP-dependent K+ channels in sevoflurane-induced vasodilation in isolated human fetal-placental (chorionic plate) arterial rings. They further studied whether voltage-dependent and -independent Ca2+ channels play a role in arterial vasodilation produced by sevoflurane in this model. The authors demonstrate that sevoflurane appears to block chorionic voltage-operated calcium, KCa++, and KATP channels and exerts a net vasodilatory action in the fetal-placental circulation. The results are particularly interesting because volatile anesthetics were previously shown to open KCa++ and KATP channels in coronary arteries, myocardium, and neural tissue, and these actions have been linked to the cardio- and neuroprotection against ischemia-reperfusion injury. Taken together, the present results in fetal-placental arterial rings and those obtained in the coronary and neural circulations may represent a fascinating tissue specificity that deserves additional exploration. The experiments are hypothesis-driven, the data are interpreted correctly, and the manuscript is well written. I've made a number of suggestions below that the authors may wish to incorporate into a revision.

Specific Comments

Methods: The authors are very familiar with the isolated arterial ring preparation used in the current investigation. This section of the methods should be reduced in length with appropriate citation to previous work.

Experimental interventions: This section is far too long; please shorten by 50%. Dose-response relationships to sevoflurane were obtained in the presence and absence of pharmacological inhibitors of Ca++, KCa++, and KATP channels. A figure illustrating the protocols would be especially beneficial.

Experimental interventions: How were the doses of pharmacological inhibitors determined? Would the authors expect different results if different doses of these drugs were used? Please be specific because the implications of the results depend upon this dose-selectivity.

Results: I’m surprised that the authors didn’t choose a single concentration of sevoflurane (for example, 2%) and then study a dose-response to inhibitors. Why?
Results: Please shorten this section as well.

Discussion: Why are your results with KCa++ and KATP channel blockers in the fetal-placental circulation different than those in the coronary and cerebral circulation? Further explanation is needed. Please elaborate.

**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