Reply to: “Letter to the editor: Ketamine-only versus isoflurane effects on murine cardiac function: comparison at similar depths of anesthesia?”

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REPLY: The letter by Zuurbier et al. (8) questions one of the conclusions in our recently published article (5), that ketamine alone, at a dose of 150 mg/kg, was the best anesthetic for echocardiography. Zuurbier et al. noted that they were “unable to reach a surgical plane of anesthesia with 150–250 mg/kg ketamine 5–10 min after induction; also additional boluses of 50 mg/kg did not result in the disappearance of the pedal withdrawal reflex.” In contrast, a dose of 150 mg/kg consistently results in disappearance of the pedal withdrawal reflex in our laboratory.

First, we need to clarify that even though we observed the disappearance of the pedal withdrawal reflex, we are not proposing the use of ketamine alone for surgery. Our article was solely focused on anesthetics for echocardiography in mice, a technique that causes no pain.

Second, to put our results into perspective, we list several articles using ketamine alone as an anesthetic for mice in the following table. Please note that the doses that others used, ranging from 50 to 100 mg/kg (1–4, 6, 7), are even lower than the dose we used (150 mg/kg). Just one article quoted in the Zuurbier et al. letter (8) published the dose used for ketamine alone (3). That study used a dose of 80 mg/kg (see Table 1). Four of their references quoted did not give the dose of ketamine alone.

In summary, we cannot reconcile the differences between your experience and ours, but we do believe our experience is more consistent with the literature on this topic. Nonetheless, we hope that your thoughtful letter and our article (5) will stimulate more work in the future on this topic, not simply related to anesthetics for echocardiography.

DISCLOSURES

No conflicts of interest, financial or otherwise, are declared by the author(s).

Table 1. Ketamine alone in mice

<table>
<thead>
<tr>
<th>Dosage of Ketamine Alone, mg/kg</th>
<th>Reference</th>
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</thead>
<tbody>
<tr>
<td>80</td>
<td>Green et al., 1981 (3)</td>
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<tr>
<td>50</td>
<td>Ullrich et al., 2000 (6)</td>
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<tr>
<td>100</td>
<td>Cokkinos et al., 2010 (1)</td>
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<tr>
<td>100</td>
<td>Cook et al., 2014 (2)</td>
</tr>
<tr>
<td>100</td>
<td>Lairz et al., 2013 (4)</td>
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<tr>
<td>100</td>
<td>Xu et al., 2007 (7)</td>
</tr>
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REFERENCES