Table 1. A Comparison of Cholinesterase Activities in Dogs and Humans (±1 SD) Measured Using Four Substrates. Figures in Parentheses Represent the Mean Activity in Dogs Expressed as a Percentage of that for Humans Using the Same Substrate

<table>
<thead>
<tr>
<th>Substrate</th>
<th>Propionyl Thioclone IU/ml</th>
<th>Butyryl Thioclone IU/ml</th>
<th>Benzylopholine IU/ml</th>
<th>Sucinylpholine IU/ml</th>
</tr>
</thead>
<tbody>
<tr>
<td>Humans</td>
<td>N = 117</td>
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<td></td>
<td>4.58 ± 1.16</td>
<td>5.04 ± 1.27</td>
<td>0.88 ± 0.25</td>
<td>58.5 ± 11.75*</td>
</tr>
<tr>
<td>Dogs</td>
<td>N = 14</td>
<td></td>
<td></td>
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<td>2.33 ± 0.94 (48.7%)</td>
<td>2.33 ± 0.47 (46.2%)</td>
<td>0.36 ± 0.046 (40.1%)</td>
<td>8.6 ± 4.3 (14.8%)</td>
</tr>
<tr>
<td></td>
<td>P &lt; 0.001†</td>
<td>P &lt; 0.001†</td>
<td>P &lt; 0.001†</td>
<td>P &lt; 0.001†</td>
</tr>
</tbody>
</table>

* N = 91.
† Statistical method employed: t test assuming unequal variance.

oxidase, peroxidase, and 4-aminophenazone. The first three compounds are widely used in laboratories interested in the investigation of cholinesterase problems in humans, but SDC has only recently been made amenable to such use. In this context, its advantages over other substrates are still a matter for debate.4,6

Our results are shown in table 1.

Dogs have lower cholinesterase activities than humans, whichever substrate is used, but the contrast is most marked when results obtained using SDC are compared.

As Professor Merin has pointed out, muscle relaxation in dogs is readily achieved following administration of 0.1–0.2 mg SDC/kg bodyweight, 10–20% of that required in humans. Such an observation can be reconciled with plasma cholinesterase activity only when the latter is measured using SDC. This emphasises the importance of using such a method in the investigation of all animal species, but especially those in which experience with the use of SDC as a muscle relaxant is limited.

We believe that the failure until now to explain fully the differences in response of dogs and men to succinylcholine stems from the choice of techniques for cholinesterase analysis notable for their biochemical simplicity, rather than pharmacological relevance.

REFERENCES

1. Merin RG: Succinylcholine is different in humans than in dogs. Anesthesiology 65:452, 1986

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In Reply—I am very pleased to see the results of the plasma cholinesterase assays reported by Faye and Evans. Certainly their continued interest has resulted in clarification of the mechanism of the difference in kinetics for succinylcholine between humans and dogs. Appreciation of the difference is particularly important if investigators wish to recover their animals for use in chronic experiments. Elucidation of the mechanism behind these differences cannot help but advance experimental investigation. I thank Drs. Faye and Evans for their efforts.

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