A NOTE ON THE RESPIRATORY EFFECTS OF ANILERIDINE

BY

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ANILERIDINE dihydrochloride has been shown to be a useful analgesic agent for pre-operative medication (Dechene and Hebert, 1959), post-operative medication (Riffin et al., 1958; Dechene and Hebert, 1959) and for the supplementation of anaesthesia (Chang, Safar and Lasagna, 1958; Swerdlow, Brown and Tetlow, 1960). The present paper reports a small study of the effects of anileridine on respiration in anaesthetized subjects. The results are compared with those of an investigation of the respiratory effects of pethidine, carried out earlier under identical conditions (Swerdlow, 1957). The standard of equipotency adopted was that of Keats, Kurosi and Telford (1957), i.e. 40 mg anileridine is equivalent to 100 mg pethidine. As a dose of 0.6 mg/kg pethidine had been employed in the pethidine study (Swerdlow, 1957) the dose of anileridine used initially in the present work was therefore 0.24 mg/kg.

EXPERIMENTAL TECHNIQUE

The experimental conditions employed have been described in detail elsewhere (Swerdlow, 1957, 1959). Briefly, the premedicated patient was given 8 mg/kg 5 per cent thiopentone sodium by intravenous injection in 45 seconds. Nitrous oxide and oxygen were then administered and 5 minutes after the start of the thiopentone injection the respiratory rate and minute volume were measured. At 6 minutes 0.24 mg/kg anileridine dihydrochloride was injected intravenously in 15 seconds and the respiratory rate and minute volume were measured 3, 5, 7 and 9 minutes later (i.e. 9, 11, 13 and 15 minutes after “zero”). Respiratory volume was measured with a Bennett ventilation meter inserted on the expiratory side of the circuit. All the patients were aged between 18 and 60 years and were in good general condition.

In view of the effects of this dose of anileridine a further group of 20 patients were given half the above dose of the narcotic (i.e. 0.12 mg/kg) under similar conditions and the same measurements were made.

RESULTS

Anileridine 0.24 mg/kg

Of the 20 patients who were given 0.24 mg/kg anileridine, 7 developed apnoea which lasted from 7 to 15 minutes. (During this period the respirations were assisted by gentle squeezing of the breathing bag.) None of the patients in the (earlier) pethidine series developed apnoea. The mean percentage changes in respiratory rate and volume are shown in tables I and II, together with the comparable figures for the pethidine series. It will be seen that this dose of anileridine produced significantly more depression of the respiration than 0.6 mg/kg pethidine.

<table>
<thead>
<tr>
<th>Drug</th>
<th>9 min</th>
<th>11 min</th>
<th>13 min</th>
<th>15 min</th>
<th>Student's t</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pethidine</td>
<td>-48.0</td>
<td>-53.5</td>
<td>-53.3</td>
<td>-52.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anileridine 0.12 mg</td>
<td>-41.8</td>
<td>-44.8</td>
<td>-45.1</td>
<td>-44.3</td>
<td>2.5796</td>
<td>.01&lt;P&lt;0.02</td>
</tr>
<tr>
<td>Anileridine 0.24 mg</td>
<td>-74.3</td>
<td>-75.4</td>
<td>-76.7</td>
<td>-73.5</td>
<td>6.8463</td>
<td>P&lt;0.001</td>
</tr>
<tr>
<td>Anileridine 0.24 mg (excluding apnoic cases)</td>
<td>-62.4</td>
<td>-64.1</td>
<td>-61.9</td>
<td>-60.2</td>
<td>3.5857</td>
<td>P&lt;0.001</td>
</tr>
</tbody>
</table>
Percentage change in respiratory rate (means of individual deviations)

Percentage change in minute volume (means of individual deviations)
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Table II
Percentage change from control (means of individual deviations)

<table>
<thead>
<tr>
<th>Drug</th>
<th>9 min</th>
<th>11 min</th>
<th>13 min</th>
<th>15 min</th>
<th>Student's t</th>
<th>Significance P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pethidine</td>
<td>-43.4</td>
<td>-46.2</td>
<td>-39.5</td>
<td>-33.5</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Anileridine 0.12 mg</td>
<td>-34.5</td>
<td>-32.4</td>
<td>-28.3</td>
<td>-22.0</td>
<td>3.910</td>
<td>P&lt;0.001</td>
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<tr>
<td>Anileridine 0.24 mg</td>
<td>-74.0</td>
<td>-69.0</td>
<td>-67.6</td>
<td>-63.6</td>
<td>7.0583</td>
<td>P&lt;0.001</td>
</tr>
<tr>
<td>(excluding apnoeic cases)</td>
<td>-61.9</td>
<td>-54.7</td>
<td>-46.9</td>
<td>-40.4</td>
<td>3.2615</td>
<td>P&lt;0.01</td>
</tr>
</tbody>
</table>

Anileridine 0.12 mg/kg.

This dose of anileridine did not give rise to apnoea in any patient. Statistical analysis shows that 0.12 mg/kg anileridine caused significantly less depression of the minute volume than did 0.6 mg/kg pethidine and appreciably less depression of the respiratory rate (see tables I and II). The results are shown in graphic form in figures 1 and 2.

In conclusion, in terms of its effects on respiration, anileridine has been found to be between 2.5 and 5 times as potent as pethidine. This is similar to the analgesic potency ratio (3.8:1) which was found in a clinical comparison of anileridine and pethidine (Swerdlow, Brown and Tetlow, 1960).

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References


