A COMPARISON OF ALTHESIN AND METHOHEXITONE IN PAEDIATRIC ANAESTHESIA

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SUMMARY

The minimum sleep doses of Althesin and methohexitone were determined in two age groups of children. In the 2–10 years age group, the dose of Althesin was 0.07 ml/kg, and that of methohexitone was 1.1 mg/kg. In the 10–16 years age group, the dose of Althesin was 0.05 ml/kg, and that of methohexitone was 1.2 mg/kg. Althesin has the advantages of small injection volume and a painless injection. However, involuntary muscle movement on injection was found to be more frequent and more severe with Althesin than with methohexitone.

Recommended sleep doses of Althesin (alphaxolone and alphadolone acetate) have varied from 0.03 ml/kg (Miller, Bradford and Campbell, 1972) to 0.15 ml/kg (Campbell et al., 1971). Since formulae based on a dose per unit of weight generally become inaccurate when applied to children, the aim of this study was to establish and compare the minimum sleep dose of Althesin and methohexitone in children between the ages of 2 years and 16 years and to compare the two drugs as induction agents in this age group.

METHODS

The children were undergoing all types of surgery, except abdominal emergencies. They were divided into two groups:

Group A: 54 children between the ages of 2 and 10 years.

Group B: 72 children between the ages of 10 and 16 years.

The children were premedicated with diazepam 0.25 mg/kg with atropine 0.6–1.2 mg given orally 90 min before the operation. Patients with an even numbered birth month then received methohexitone, and those with an odd numbered birth month received Althesin.

Procedure.

The preparations used for induction were methohexitone 1% and Althesin, diluted with an equal volume of normal saline. The agent was injected slowly by small increments into an antecubital vein over a period of approximately 30 sec, while the patient was encouraged to count aloud for as long as possible. When counting ceased, a note was made of the dose given, and this was taken as the minimum sleep dose.

A further 50% of that dose was then given, and where endotracheal intubation was indicated, this was followed by an appropriate dose of suxamethonium. Anaesthesia was continued with a nitrous oxide, oxygen and halothane anaesthetic mixture.

A record was kept of side effects during induction, and the injection site was examined on the first and second postoperative days.

RESULTS

The results are as shown in tables I and II.

Examination of the injection site on the first and second days after operation failed to show any evidence of inflamed or thrombosed veins with either agent.

TABLE I. Age, weight and sleep dose of Althesin and methohexitone in the two groups of children. Where appropriate, mean values are given (± SD).

<table>
<thead>
<tr>
<th>Group</th>
<th>No. of patients</th>
<th>Althesin</th>
<th>Methohexitone</th>
</tr>
</thead>
<tbody>
<tr>
<td>A (2–10 years)</td>
<td>28</td>
<td>6.6 ± 1.8</td>
<td>6.5 ± 1.2</td>
</tr>
<tr>
<td></td>
<td>21.1 ± 4.4</td>
<td>22.4 ± 3.6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.07 ± 0.03 ml/kg</td>
<td>1.1 ± 0.51 mg/kg</td>
<td></td>
</tr>
<tr>
<td>B (10–16 years)</td>
<td>33</td>
<td>11.4 ± 1.7</td>
<td>11.5 ± 2.0</td>
</tr>
<tr>
<td></td>
<td>39.7 ± 6.8</td>
<td>38.3 ± 6.8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.05 ± 0.02 ml/kg</td>
<td>1.2 ± 0.32 mg/kg</td>
<td></td>
</tr>
</tbody>
</table>
TABLE II. Side effects of Althesin and methohexitone in both groups of children.

<table>
<thead>
<tr>
<th></th>
<th>Althesin</th>
<th>Methohexitone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of patients</td>
<td>63</td>
<td>63</td>
</tr>
<tr>
<td>Involuntary muscle movements</td>
<td>40</td>
<td>28</td>
</tr>
<tr>
<td>Pain on injection</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>Laryngospasm</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Coughing, hiccup</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Swallowing, salivation</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Tachycardia*</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Respiratory depression†</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

*Pulse rate increase in excess of 20/min over preoperative figure.
†Respiratory depression severe enough to require assisted ventilation.

DISCUSSION

The minimum sleep dose for Althesin in the 2–10 year age group (0.07 ml/kg) is significantly larger than that for the 10–16 year age group (P<0.01), which is the same as that given by Clarke and his colleagues (1971) for adults premedicated with atropine alone (0.05 ml/kg).

The most notable side effect seen with both Althesin and methohexitone was involuntary muscle movement, which was both more prevalent and more severe with Althesin.

Both agents provided a smooth, pleasant induction, but pain on injection was noted in six patients who received methohexitone, an effect which was not seen with Althesin.

Althesin seems to have two features which are of value in paediatric anaesthesia: first, the small volume required for induction, allowing a small syringe to be used and possibly to be concealed from the child during use, and secondly the painlessness of the injection. However, the frequency and severity of involuntary muscle movement, which was at times violent enough to dislodge the needle from the vein, is a major disadvantage.

REFERENCES


MANCHESTER MEDICAL SOCIETY

Section of Anaesthetics

Programme for session 1974–5

1974
October 10  Presidential Address: Dr I. M. Gow, “Anaesthesia for laryngeal surgery”
November 14  Dr J. SELWYN CRAWFORD, “Lessons learned from 6000 lumbar epidural blocks for labour and delivery”
December 12  Dr J. G. WHITWAM, “Current concepts of respiratory control”

1975
January 9  Mr PETER BLYTHE, “An analysis of the failures of hypnotherapy”
February 13  Entries for the I.C.I. Registrars’ Prize.
March 13  Symposium on interesting cases and complications. To be held at Preston.
April 10  Joint Meeting with the Liverpool Society of Anaesthetists. To be held at Liverpool.

Meetings held in the Stopford Building of the University of Manchester at 8.15 p.m.