Rectally administered dimenhydrinate reduces postoperative vomiting in children after strabismus surgery

A. Schlager*, G. Mitterschiffthaler and F. Pühringer

Department of Anaesthesia and Intensive Care Medicine, Division of Anaesthesia, Leopold Franzens University of Innsbruck, Austria

*Corresponding author: Department of Anaesthesia and General Intensive Care Medicine, Anichstraße 35, A-6020 Innsbruck, Austria

We have investigated the effectiveness of rectally administered dimenhydrinate on postoperative vomiting in children undergoing strabismus surgery, in a double-blind, randomized, placebo-controlled study. In one group, dimenhydrinate 50 mg was administered rectally 30 min before starting anaesthesia, whereas in the control group, placebo suppositories were given. Children who received dimenhydrinate showed a significantly (P<0.001) lower incidence of vomiting (15%) than those in the control group (75%). We conclude that rectal administration of dimenhydrinate is an effective means of reducing postoperative vomiting in children undergoing strabismus surgery.

Keywords: anaesthesia, paediatric; pharmacology, dimenhydrinate; vomiting, postoperative; vomiting, incidence; vomiting, antiemetics; surgery, ophthalmological

Accepted for publication: September 16, 1999

Postoperative vomiting (POV) is a common problem after strabismus surgery in children with an incidence of 40–88%. Numerous studies have been performed to examine different antiemetics for their effectiveness in decreasing the incidence of POV after strabismus surgery. The H₂ antagonist dimenhydrinate is an inexpensive but rarely investigated antiemetic. When administered i.v., reports on the effects of dimenhydrinate in the prevention of POV in children undergoing strabismus surgery or adenotonsillectomy have been inconclusive.

In this study, we have examined the antiemetic effect of preoperative rectal administration of dimenhydrinate in children undergoing strabismus surgery compared with a placebo group.

Methods and results

The study was approved by the Ethics Committee of the University of Innsbruck, Austria. Written informed consent was obtained from the parents of all children. We studied 40 children, ASA I, aged 3–12 yr, undergoing strabismus surgery. We excluded those with gastric or intestinal diseases, emesis and/or vomiting in the previous week and those who received any medical therapy immediately before surgery.

In this double-blind, prospective study, each child was allocated randomly to one of two groups. Children in group A received dimenhydrinate 50 mg rectally, 30 min before induction of anaesthesia; children in group B received a placebo suppository.

All patients were allowed solid food or clear fluids up to 6 h before anaesthesia. Oral premedication with midazolam 0.35 mg kg⁻¹ (maximum 10 mg) and atropine 0.02 mg kg⁻¹ was given 1 h before transfer to the operating room. For painless placement of an i.v. cannula, each child received 5% EMLA cream (Astra, Austria) on a vein in the left cubita or on the back of the left hand.

Strabismus repair was performed under general anaesthesia by the same surgeon. After standard monitors were attached, anaesthesia was induced with thiopental 5 mg kg⁻¹ i.v. and fentanyl 2 µg kg⁻¹ i.v. To facilitate intubation, rocuronium 0.6 mg kg⁻¹ was given i.v. Anaesthesia was maintained with 1.5–2.5% sevoflurane and 66.6% nitrous oxide in oxygen under controlled ventilation. Fluid deficit was replaced by infusion of a mixture of three parts Ringer’s lactate solution and two parts 5% dextrose. Immediately after arriving in the recovery room, all patients received paracetamol suppositories 10 mg kg⁻¹ for postoperative analgesia.

The incidence of vomiting over 24 h after induction of anaesthesia was recorded by the nursing staff in the recovery room and on the ward. After surgery, all patients remained in the clinic for at least 24 h. If any patient vomited more than once, the ward nurses administered antiemetic rescue therapy (dimenhydrinate 50 mg suppositories).

Data were analysed using Fisher’s exact test to determine
Table 1 Patient characteristics and incidence of postoperative vomiting (mean (SD or range) or number (%))

<table>
<thead>
<tr>
<th></th>
<th>Dimenhydrinate (n = 20)</th>
<th>Placebo (n = 20)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (yr)</td>
<td>6.5 (4–11)</td>
<td>5.9 (3–11)</td>
<td>ns</td>
</tr>
<tr>
<td>Sex (M/F)</td>
<td>10/10</td>
<td>11/9</td>
<td>ns</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>24.6 (9.1)</td>
<td>21.8 (6.1)</td>
<td>ns</td>
</tr>
<tr>
<td>Anaesthesia duration (min)</td>
<td>74 (16)</td>
<td>69 (17)</td>
<td>ns</td>
</tr>
<tr>
<td>Surgery duration (min)</td>
<td>54 (17)</td>
<td>48 (16)</td>
<td>ns</td>
</tr>
<tr>
<td>No. of muscles repaired</td>
<td>2.9 (0.9)</td>
<td>2.5 (0.8)</td>
<td>ns</td>
</tr>
<tr>
<td>Incidence of POV within 24 h</td>
<td>3/20 (15%)</td>
<td>14/20 (70%)</td>
<td>0.001</td>
</tr>
</tbody>
</table>

the incidence of vomiting and the unpaired t test to analyse patient characteristics. P<0.05 was regarded as statistically significant.

There were no significant differences between groups for age, sex, ASA status, weight, height, duration of anaesthesia, duration of surgery or number of repaired muscles (Table 1).

Compared with the placebo group, the incidence of vomiting was significantly lower in the dimenhydrinate group (P<0.001). Within the first 24 h after surgery, vomiting occurred in three children (15%; 95% CI 2.15–32%) in the dimenhydrinate group and in 14 (70%; 95% CI 48–92%) in the placebo group (Table 1).

Within the first 24 h, the overall incidence of vomiting in the dimenhydrinate group was lower (eight times in three children) than in the placebo group (62 times in 14 children). In the dimenhydrinate group, one of the three children who vomited received antiemetic rescue medication compared with nine of 14 children in the placebo group.

**Comment**

We have demonstrated that dimenhydrinate, administered rectally 30 min before induction of anaesthesia, reduced the incidence of POV in children after strabismus surgery. Previous studies reported contradictory results on the effectiveness of dimenhydrinate as an antiemetic in children. Dimenhydrinate 0.5 mg kg\(^{-1}\) i.v., given at induction of anaesthesia, caused a significant reduction in POV in children undergoing strabismus surgery (30% in the dimenhydrinate group and 65% in the placebo group).\(^4\) However, Hamid and colleagues\(^3\) found no significant difference in the incidence of POV in children after adenotonsillectomy compared with placebo (79% in the dimenhydrinate group, 82% in the placebo group).

Our results correspond to the findings of Vener and colleagues.\(^4\) Children who received dimenhydrinate had significantly (P<0.001) less POV during the 24 h in hospital than those in the placebo group (15% in the dimenhydrinate group and 70% in the placebo group). In our study there were no adverse side effects, such as sedation, hypotension, adverse CNS reactions or skin reactions, in children who received dimenhydrinate.

**Acknowledgements**

We thank the nursing staff of the paediatric ward of the Clinic for Ophthalmology and Optometry, Innsbruck.

**References**