Cardiovascular and respiratory effects of oral premedication with trimeprazine and droperidol in children

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Summary

The systolic blood pressure, pulse rate and respiratory rate were assessed in 112 children before and after receiving premedication consisting of trimeprazine (3 mg/kg) and droperidol (0.2 mg/kg) by mouth. A mild (10%) drop in blood pressure was shown, but no statistical difference was found in the other parameters measured. The premedication is highly efficacious, 70% of patients being asleep in the preanaesthetic room; 27% were calm and only 3% were distressed or crying.

A recent publication reports serious untoward sequelae, including a drop in blood pressure, bradycardia and abdominal pain, in 4 patients following trimeprazine premedication. Because trimeprazine (in combination with droperidol) has been the routine premedicant at our institution for more than 18 years, a prospective study was undertaken to investigate the effect of trimeprazine/droperidol premedication per se on blood pressure, pulse and respiratory rate, to document its efficacy and to note any untoward side-effects. While many previous studies have shown the effectiveness of this premedication, none have reported the effects on the cardiovascular and respiratory systems.

Patients and methods

The study group comprised 112 children between the ages of 6 months and 12 years scheduled for elective surgery selected consecutively irrespective of their medical condition unless it was associated with hypertension or they were receiving intravenous fluids or were crying (which causes extremely elevated blood pressures) at the initial visit. The patient assessment was carried out by one investigator (B.M.) using the same equipment throughout. Systolic blood pressure was measured before and after premedication using one of three standard cuff sizes (6.5 cm 'infant' cuff width, 9 cm 'child' cuff, and 12.5 cm 'adult' cuff) so that the cuff covered two-thirds of the upper arm; the same cuff applied to the same arm was used on both occasions with the patient supine. A mercury sphygmomanometer and an ultrasonic Doppler detector with a 10 MHz probe over the radial artery were used. The systolic blood pressure was taken as the highest pressure at which the Doppler elicited an audible pulse.

The premedication consisted of oral trimeprazine 3 mg/kg and droperidol 0.2 mg/kg approximately 2 hours pre-operatively. Half-strength Darrow's solution with 5% dextrose with Oros was offered on an ad libitum basis up to 2 hours before premedication to obviate dehydration and hypoglycaemia. Ninety per cent of patients were reassessed between 1½ hours and 2½ hours after administration of the premedication and a further 5% by 3 hours (the total time ranged from 1½ hours to 3 hours 40 minutes). A record was kept of the blood pressure, heart and respiratory rate as well as the level of sedation according to the criteria of 'calm', 'asleep' or 'crying'.

Results

The parameters measured were recorded: (i) overall; and (ii) in two subsets — (a) < 3 years, (b) > 6 years. Changes in blood pressure, pulse and respiratory rates are shown in Table I. Children of subset (a) showed no significant changes in blood pressure whereas the study as a whole and the subset (b) both showed a small clinical (< 10%) but statistically significant fall in blood pressure. The actual amount of change in blood pressure before and after premedication in the two subsets was compared and no statistical difference was found.

The effectiveness of the premedication as a hypnotic is shown in Table II.
TABLE I. CHANGES IN BLOOD PRESSURE, PULSE AND RESPIRATORY RATE (± SD) IN 112 PATIENTS

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Before premedication</th>
<th>After premedication</th>
<th>% change</th>
<th>Significance (Student's t-test)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Systolic blood pressure (mmHg)</td>
<td>116 ± 15</td>
<td>106 ± 17</td>
<td>9.7</td>
<td>Significant: P &lt; 0.000002</td>
</tr>
<tr>
<td>Subset A (35 patients &lt; 3 yrs)</td>
<td>118 ± 17</td>
<td>112 ± 19</td>
<td>4.9*</td>
<td>Not significant</td>
</tr>
<tr>
<td>Subset B (31 patients &gt; 6 yrs)</td>
<td>111 ± 15</td>
<td>101 ± 14</td>
<td>9.8*</td>
<td>Significant: P &lt; 0.0075</td>
</tr>
<tr>
<td>Pulse rate/min</td>
<td>110 ± 19</td>
<td>105 ± 22</td>
<td>4.0</td>
<td>Not significant</td>
</tr>
<tr>
<td>Respiratory rate/min</td>
<td>27 ± 8</td>
<td>22 ± 6</td>
<td>21.0</td>
<td>Significant: P &lt; 0.000002</td>
</tr>
</tbody>
</table>

*Comparison of change in blood pressure of two subsets not significant.

TABLE II. EFFECTIVENESS OF PREMEDICATION AS A HYPNOTIC

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Before premedication</th>
<th>After premedication</th>
<th>% change</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of patients awake</td>
<td>83* (75%)</td>
<td>33† (30%)</td>
<td></td>
</tr>
<tr>
<td>No. of patients asleep</td>
<td>29 (25%)</td>
<td>79 (70%)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>112</td>
<td>112</td>
<td></td>
</tr>
</tbody>
</table>

*1 child distressed/crying.
*Includes 3 distressed/crying children, P < 0.0005 (Y² test).

On analysis data from a subgroup of 14 patients, who were only assessed 2½ - 3½ hours after receiving the premedication (because of theatre delays), showed a similar statistically significant effectiveness (P < 0.0005) confirming the prolonged duration of action of these agents.

Only 3 children were crying or distressed on arrival in theatre; all the remainder were asleep or calm, demonstrating the efficacy of this form of premedication. No pallor, vomiting, abdominal pain or any other untoward effects were noted pre-operatively in any patient.

Discussion

This study confirms that a combination of trimeprazine and droperidol is a highly effective and safe premedication, with no untoward sequelae observed in this trial. It is particularly suitable before inhalational induction of anaesthesia where care is taken not to disturb and awaken patients during the pre-induction period and the psychological stress of applying a facemask is thus avoided. Some studies note that children who are disturbed tend to be irritable once aroused, which has been our experience too but has not been found to be a great problem.

No adverse cardiovascular or respiratory side-effects were shown and, while one cannot rule out idiosyncratic responses, it would seem that the report by Loan and Cuthbert of 4 such patients (only 1 of which is reported in detail) is somewhat misleading. No such problems were encountered in this investigation (or documented in over 18 years of experience at this institution).

Conclusion

A trimeprazine/droperidol combination is a safe and highly effective form of premedication in all types of patients and is particularly suitable before inhalational induction.

The authors wish to thank Professor G. G. Harrison for reviewing and Miss J. Garschagen for typing the manuscript.

REFERENCES