Intravenous fluid replacement minimised dehydration during sodium picosulphate bowel preparation for colonic surgery

QUESTION: In patients receiving sodium picosulphate (Picolax®) bowel preparation before colonic surgery, does intravenous fluid replacement minimise dehydration?

Design
Randomised (unclear allocation concealment), unblinded, controlled trial with follow up to 1 hour before surgery or immediately before premedication.

Setting
Colorectal Unit, Derriford Hospital, Plymouth, UK.

Patients
41 patients (median age 69 y, 63% men) who were receiving bowel preparation for colonic surgery. Follow up was 100%.

Intervention
19 patients were allocated to receive a calculated volume (mean 2 l) of intravenous normal saline (treatment group), and 22 were allocated to receive no intravenous fluid (control group) during bowel preparation. Intravenous fluid administration (hourly infusion rate 4 ml/kg for the first 10 kg, 2 ml/kg for the second 10 kg, and 1 ml/kg for each subsequent kg) began at the same time as Picolax® (Ferring Pharmaceuticals, Langley, UK) administration. Each group received 2 sachets of Picolax 6 hours apart, starting 18 hours before surgery, and were encouraged to drink unlimited clear fluids until 6 hours before surgery.

Main outcome measures
Physiological (weight, pulse, and supine and erect blood pressure), haematological (haemoglobin and haematocrit), and biochemical (sodium, potassium, urea, creatinine, and urine osmolality) variables measured immediately before starting bowel preparation and repeated 1 hour before surgery, and were encouraged to drink unlimited clear fluids until 6 hours before surgery.

Main results
The treatment group had a lower mean weight loss, postural change in systolic blood pressure, and serum creatinine concentration than the control group (table).

<table>
<thead>
<tr>
<th>Outcomes at 1 hour before surgery or immediately before premedication</th>
<th>Treatment</th>
<th>Control</th>
<th>Difference (95% CI)</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change in body weight from baseline (kg)</td>
<td>-0.5</td>
<td>-1.6</td>
<td>1.1 (0.4 to 1.8)</td>
<td>0.01</td>
</tr>
<tr>
<td>Postural change in systolic blood pressure from baseline (mm Hg)</td>
<td>-2.8</td>
<td>8.8</td>
<td>11.6 (N/R)</td>
<td>0.015</td>
</tr>
<tr>
<td>Change in creatinine concentration from baseline (µmol/l)</td>
<td>-3.8</td>
<td>1.8</td>
<td>5.6 (1.5 to 9.7)</td>
<td>0.008</td>
</tr>
</tbody>
</table>

*Abbreviations defined in glossary; CI calculated from data in article. N/R—not reported.

Conclusion
Simultaneous intravenous fluid administration during bowel preparation before colonic surgery minimised the dehydrating effect of Picolax®.

COMMENTARY
Preparing the bowel for surgery can increase risk of fluid and electrolyte imbalance, which, if uncorrected, can lead to hypotension during anaesthesia. Successful strategies to ensure that patients having colorectal surgery are adequately hydrated are therefore imperative. Encouraging patients to increase their oral fluid intake during bowel preparation is currently the most common strategy used by nurses to minimise dehydration before fasting for surgery. This well done trial by Sanders et al, however, supports the administration of intravenous fluids during oral lavage preparation with Picolax®. Study limitations include a short duration of follow up, and failure to consider cost implications. Improvement in hydration by the administration of intravenous fluids was clearly shown, but postoperative benefits could not be determined because follow up occurred only until 1 hour before surgery or immediately before premedication.

Previous studies comparing outpatient (no intravenous fluid support) with inpatient bowel preparation have found no difference in postoperative complication rates. These studies also achieved considerable cost savings by reducing the length of stay before surgery. It should be noted that the laxative in these studies was polyethylene glycol solution involving up to 4 l of fluid. There is a trend towards the use of low volume preparations, such as Picolax®, and clinicians should be cautious in applying the findings of Sanders et al to all low volume preparations.

Most comparisons of colonic cleansing for investigative procedures have found little difference in effectiveness between cleansing regimens, and instead focused on patient preference and side effects. Low volume preparations such as Picolax® and Fleet (phospho-soda buffered saline) are often preferred by patients. But a less aggressive outpatient regimen (ie, larger volume polyethylene glycol) may be desirable for patients at risk of fluid and electrolyte imbalance. The findings of Sanders et al suggest a safe and effective preoperative strategy for these patients if inpatient care is required.

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Intravenous normal saline replacement (treatment) vs no intravenous fluid replacement (control) during Picolax® bowel preparation for colonic surgery*