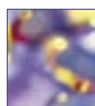


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Bowel preparation

Richard Sarre, Colorectal surgeon, Adelaide

Summary

Colonoscopy and radiological investigations of the large bowel require the bowel to be cleared of faeces. In addition to dietary restriction, patients are usually given a laxative, orally or rectally.

Osmotic laxatives containing sodium phosphate are highly effective, but can cause severe electrolyte disturbances. Polyethylene glycol is an osmotic laxative which is less likely to cause this problem. It is given in an iso-osmotic solution, but patients have to drink several litres of fluid. Stimulant laxatives such as bisacodyl and sodium picosulfate are easy to use, but can also cause electrolyte disturbances.

Key words: laxatives, colonoscopy.

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Introduction

Complete cleaning of the large bowel is essential for colonoscopy and radiological investigation of the colon (barium enema and more recently CT colonography). Bowel preparation has also traditionally been used prior to colonic surgery although the evidence for its benefit is scanty.¹ Investigation for colonic disease is common nowadays so referring doctors should have an understanding of the cleaning products used (see box), their effects, adverse effects and contraindications.

General principles

All bowel preparation regimens require exclusion of high residue foods for at least 48 hours and a diet of clear fluids only for 24 hours before the examination. This will require adjustment of insulin and oral hypoglycaemic medications

in patients with diabetes. Although some regimens require patients to drink a lot of fluid, overenthusiastic intake of water can induce hyponatraemia. Patients on diuretic therapy are especially at risk. Fluids free of non-absorbed sugars should be used to reduce the possibility of explosive gas mixtures within the colon.

If possible, medications that may aggravate constipation should be ceased (for example opiates, anticholinergics, antidiarrhoeals and iron supplements). Iron compounds tend to stick to the wall of the colon obscuring the view at colonoscopy and also inhibiting coating with barium during barium enema. Iron should ideally be stopped a week prior to the examination. It should be noted that oral medications taken at the same time as the bowel preparation may be poorly or incompletely absorbed (for example oral contraceptives, antihypertensives).

Examples of some of the products available for bowel preparation

Phosphate preparations	Fleet phospho-soda buffered saline mixture Fleet ready-to-use enema Phosphoprep
Polyethylene preparations (with electrolytes)	ColonLYTELY Glycoprep
Diphenylmethanes bisacodyl	Bisalax Durolox Fleet laxative preparations
sodium picosulfate (often combined with other laxatives)	Durolox SP Picolax
Magnesium preparations (combined with other laxatives)	Picoprep

Sodium phosphate

Phosphate preparations are commonly used orally and rectally to empty the bowel. They are highly effective and well tolerated. The mechanism of action is largely osmotic – increased fluid retention in the intestine causes distension which in turn promotes peristalsis and evacuation of the colon. When sodium phosphate is given orally, diarrhoea occurs within 0.5–4 hours while a bowel action occurs within 10–15 minutes after rectal administration. An adequate oral intake of water is essential.

Phosphate preparations have the potential to cause electrolyte disturbances² including serious hyperphosphataemia and hypocalcaemia; deaths have been reported. Sodium phosphate must therefore be avoided in patients with impaired renal function and used with great care in the presence of congestive cardiac failure because of the potential large fluid shifts. The frail, elderly and the very young are particularly at risk of fluid and electrolyte complications and alternative preparations should be used.

Polyethylene glycol

Polyethylene glycol comes mixed with a balanced electrolyte (iso-osmotic) solution and is consumed in a large volume (3–4 litres) of water. This preparation is often poorly tolerated because the patient has to drink a large volume of salty tasting fluid. As polyethylene glycol is a high molecular weight carbohydrate it holds water in the gastrointestinal tract. The volume and balanced electrolyte solution reduces the fluid shifts seen with the other osmotic and stimulant laxatives. There is not the same requirement to consume extra clear fluids and there is considerably less risk of dehydration or electrolyte disturbances. Although it is undoubtedly safer than phosphate preparations, polyethylene glycol can cause nausea, bloating and abdominal pain and may not be tolerated readily. It works within 1–4 hours.

Diphenylmethanes (bisacodyl, sodium picosulfate)

These drugs are hydrolysed by bacteria in the colon to bis (para-hydroxyphenyl)pyridyl-2-methane. This is a locally acting laxative that is minimally absorbed from the gastrointestinal tract. As it is released in the colon, it stimulates peristalsis and promotes water and electrolyte accumulation within the colon. Given orally the effect occurs 6–12 hours after ingestion. If bisacodyl is given as a suppository it is effective within 15–30 minutes. As these stimulant laxatives are easy to administer and have few adverse effects they are commonly used in conjunction with other products (for example magnesium sulphate). Adequate fluids to replace the diarrhoeal losses are essential as electrolyte disturbances can occur.³

Magnesium sulfate

Magnesium is a well-known traditional laxative which increases water in the gastrointestinal tract and stimulates peristalsis. A combination of magnesium sulfate and sodium picosulfate is a commonly prescribed oral bowel preparation, presented in two sachets. The contents of each sachet are mixed in a glass of water and taken approximately four hours apart. A laxative effect usually starts within 3–4 hours, but it is important to maintain an adequate oral intake of clear fluids during this time. The combination is relatively contraindicated in the presence of congestive cardiac failure and impaired renal function where the potential for dehydration and dangerous hypermagnesaemia exists.

Conclusion

In controlled trials, phosphate preparations have consistently scored better than polyethylene glycol preparations for patient acceptability and compliance as well as cleanliness of the bowel at colonoscopy.⁴ However, because of the potential for large fluid shifts and electrolyte disturbances, phosphate preparations are contraindicated in frail and elderly patients, children and those with cardiac failure or renal impairment.

Products containing diphenylmethane provide ease of administration. They have a lower risk of severe electrolyte disturbances than phosphate preparations, but they are relatively contraindicated in the presence of renal impairment and cardiac failure.

Phosphate preparations provide ease of administration and excellent bowel cleansing. They can be used in the majority of patients. In the presence of impaired renal function, congestive cardiac failure, and with elderly or very young patients, polyethylene glycol solutions are preferred.

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