



CLINICAL PRACTICE

Mechanical bowel preparation in gynaecological surgery – are we doing more harm than good?

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Bowel preparation is still regarded as standard practice before extensive gynaecological surgery. It is requested routinely if there is a potential malignancy or if multiple adhesions are expected. This widely used practice is coming under increasing scrutiny, and our dogma needs to change.

Colonic irrigation for the treatment of constipation has been known since ancient times. The first recorded reference to colon cleansing is in the Ebers Papyrus, an Egyptian medical document, which has been carbon dated between 1500 and 1700 BC. 'Colonic hydrotherapy' is the modern equivalent and is practised widely in alternative medicine circles. Many websites advertise the services of colon hydrotherapists, stating, for example, 'Hydrotherapy is the gentle-ist [*sic*] and most effective treatment for constipation problems. Normally healthy people will find it valuable to take colon hydrotherapy every couple of months to experience how well one feels.' Such claims are widespread, and scientists may instinctively consider them nons(c)iense as they are not based on facts. The difference between such claims and what we evidence-based practitioners call science is that our treatment is usually based on sound medical evidence. However, in the case of bowel preparation the evidence is very tenuous.

Definitions

A *cathartic* is a purging medicine that stimulates the evacuation of the bowels and a *laxative* is a preparation used to encourage defaecation or expel faeces. Polyethylene glycol (PEG) is a widely used laxative but has many other uses as a chemical compound. NaP (sodium phosphate) is a well-known laxative that is also used as a paint surface preparation, as an ingredient in hand cleaners and as a food additive with the E-number E339. For medicinal use it is usually ingested with 90 ml of solution, while PEG is often ingested with 4 litres of fluid.

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Mechanical bowel preparation (MBP) aims to reduce faecal load by mechanical means. In contrast, *antibiotic bowel preparation* (ABP) aims to reduce colonic content bacterial counts.

There are many colon-cleansing preparations, and combinations of methods may be used. Diet and cathartics are often combined. A diet may require clear fluids for 3 days before the procedure and is then combined with a cathartic-like senna or magnesium citrate. Other often-used cathartics include bisacodyl, which may be combined with sodium phosphate enemas. Gut lavage methods include PEG together with electrolytes (PEG/ELS) or PEG on its own. Phosphate preparations include oral sodium phosphate and 'fleet' sodium phosphate enemas.

Goals of MBP

MBP to reduce gastrointestinal content before diagnostic or imaging investigations is well established. Its use for this indication is fully justified, particularly with proctoscopy, colonoscopy and other intraluminal diagnostic procedures.

Other indications for MBP may be to facilitate a surgical procedure by providing more intra-abdominal space if the bowel is emptied of faecal matter. Theoretically it may also reduce the risk of bacterial contamination or soiling with formed stool during accidental entry of the bowel. A well-established belief is that mechanical bowel preparation will reduce infectious complications.

Problems with MBP

Patients often experience very unpleasant sensations and may develop serious side-effects after taking 4 litres of PEG solution. Common side-effects include abdominal distension and colicky abdominal pain. Older patients in particular may become dehydrated.¹ Patients often need intravenous fluids and may need hospitalisation. Nursing supervision is necessary for enema administration in older patients. Other serious adverse events related to mechanical colon cleansing have been reported, including electrolyte disturbances,² hypocalcaemia, oesophageal tears, bowel perforation, and severe vomiting with the risk of dehydration.¹ Hypocalcaemia and hypokalaemia were present in 58% and 56% of elderly patients respectively after oral sodium phosphate preparation.² Hyperphosphataemia after administration of phosphate-



based preparations may lead to renal failure.³ Seizures due to significant electrolyte disturbances have been reported.

Bacteria

The colon harbours the highest concentration of bacteria in the body, with more than 400 different species identified in the abdominal cavity after inadvertent spillage of bowel contents, *Escherichia coli* and *Bacteroides* species being the most common types isolated. Animal studies showed that MBP reduces the total bacteria count only by reducing the amount of stool; it does not reduce the concentration of bacteria in the remaining intraluminal liquid.⁴ MBP is therefore not adequate to reduce the risk of bacterial infection after inadvertent bowel injury.

ABP has been shown to reduce this risk significantly. Neomycin was the cornerstone of treatment in antibiotic preparation for bowel surgery, the stated dose being 1 g every 4 hours for 24 hours. It is still on the South African essential drug list but seems not to be currently available commercially. Good alternatives may be erythromycin 500 mg 6-hourly or metronidazole 400 mg 8-hourly, for 48 hours before surgery. ABP may reduce the infection rate after elective colon surgery from 40% to as low as 5%. Published data support this finding and it was reported that antibiotics reduced the concentrations of bacteria in colon contents.⁵ A review of 26 trials between 1965 and 1980 revealed that antibiotic prophylaxis reduced the infection rates after elective colon surgery by at least 14% (from 36% to 22%), and there was a reduction of 6.7% in deaths due to infection (11.2% v. 4.5%).⁶ The review concluded that antibiotic prophylaxis should be standard practice before elective colon surgery and that no future randomised studies should have a no-antibiotic arm in the design.

MBP: the evidence

A prospective randomised trial investigated 149 patients, of whom half received MBP and the other half did not. All these patients received ABP. The incidence of wound infection was significantly higher in the MBP group.⁷ In another trial 267 patients were randomised to receive Go-Lytely or no MBP. There was no difference in anastomotic leaks or surgical site infection, and the conclusion was that MBP offered no benefit in elective colorectal surgery.⁸

A meta-analysis from France included 11 studies and analysed a total of 1 450 patients.⁹ More anastomotic leakage was found after MBP than in the control arm (5.6% v. 3.2%, odds ratio (OR) 1.75, $p=0.032$). Other septic complications were more common in the MBP group but did not reach statistical significance. The authors concluded that MBP using PEG should be omitted before colorectal surgery.

A Cochrane review provides the strongest evidence that MBP may not have a beneficial effect in routine surgery, concluding that MBP before colorectal surgery does not reduce anastomotic

leakage and that its efficacy has never been proven outside observational studies. Nine trials including 1 592 patients were looked at, and no convincing evidence was found that MBP is associated with reduced rates of leakage of anastomoses; there was also no difference in mortality, re-operation rates or infectious complications after MBP. In fact, there is evidence that this intervention may be associated with 'increased rate of anastomotic leakage and wound complications'. The authors concluded that routine MBP before colorectal surgery cannot be recommended.¹⁰

A Medline search found no randomised studies of complications associated with bowel preparation in gynaecological surgery. One randomised study to evaluate the successful reduction of bowel volume in laparoscopic gynaecological surgery was found; 162 patients were randomised before laparoscopy and a blinded surgeon was asked to evaluate the degree of bowel preparation on a 5-point scale. The overall evaluation of the surgical field between the two groups was not significantly different.¹¹ However, the incidence of side-effects was significantly more severe in patients subjected to MBP. Symptoms included insomnia, weakness, abdominal distension, hunger and thirst, and also nausea and vomiting.

Conclusions

MBP has an important function in reducing faecal matter before certain imaging and diagnostic procedures. An empty bowel is essential for clear inspection of the mucosal surfaces during colonoscopy. Strong scientific evidence supports ABP to reduce infective morbidity associated with bowel surgery. If gynaecological surgery that may include possible bowel entry or a high risk of accidental bowel injury is planned, it is prudent to treat the patient with ABP.

There is no evidence to support MBP in patients for elective surgery and, because it causes significant discomfort and may be detrimental to the patient's health, it should not be offered as a routine treatment. Despite this information MBP is still widely practised; 471 US colorectal surgeons admitted that they all used routine MBP.¹² PEG was the most commonly used method, followed by oral sodium phosphate, and all also used ABP. The practice of routine MBP is changing, and a recent survey among general surgeons in two academic hospitals in South Africa revealed that routine MBP is no longer used.

There are few objective data to support the practice of MBP before elective gynaecological surgery to reduce the risk of infective morbidity. There are no randomised trials studying high-risk gynaecology patients. Taking the findings of general surgeons into account, the routine practice of MBP in gynaecological surgery needs to be reconsidered. There is little or no scientific justification for a procedure with potentially serious side-effects.



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