Mucosal changes after a polyethylene glycol bowel preparation for colonoscopy are less than those after sodium phosphate

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TO THE EDITOR:

Colonoscopy is considered to be the gold standard investigation for assessing the colonic mucosa. Clearance of the entire colon is essential for an effective imaging. Given the choice of laxative regimens available, osmotic laxatives such as sodium phosphate (NaP) and polyethylene glycol (PEG) are most commonly used. NaP increases colon water content by attracting extracellular fluid reflux through the bowel wall and maintaining oral fluids in the lumen. PEG works somewhat differently. It is a high molecular weight non-absorbable macrogol polymer which is administered in a dilute electrolyte solution. As a result of the osmotic effect of the polymer, the electrolyte solution is retained in the colon, where it acts as a bowel cleanser. There is little fluid exchange across the colonic mucosal membranes. When comparing the NaP and PEG preparations, there is evidence that PEG is less well tolerated because of the volume of liquid that the patient is required to drink (1,2). However, despite better acceptability, the NaP preparation is associated with an increased incidence of electrolyte abnormalities, nausea, vomiting and anal irritation (1). It is well documented that NaP also has increased adverse effects in colonic mucosa (2–6). In our previous study published in this journal (7), mild focal mucosal edema, hyperemia and hemorrhages were found in bowel biopsies of all 42 patients after the NaP application. More pronounced lesions such as focal cryptitis, increased proliferation and apoptosis of the crypt epithelium and a focally flattened surface epithelium occurred in 5 cases (11.9 %). In two of them (4.8 %) small erosions were seen.

After the publication of our study on changes after NaP (7), we have collected stepwise a series of biopsies after the PEG preparation. Our aim was to compare these PEG-induced changes with those after the NaP preparation.

Our study group consisted of 40 patients (18 men and 22 women, mean age 43.6 years), who were each prepared for a colonoscopy with PEG, using currently available Fortrans (Beaufour Ipsen Pharma, Paris, France). Patients were instructed to begin drinking 500 ml of Fortrans at 2 PM the day prior to the procedure and then 200 ml every 15 minutes until completion. Thirty five patients underwent a colonoscopy for diarrhea and suspicion for microscopic colitis, and another 5 patients were examined for polyps. None of the patients had used any antibiotics, immunosuppressive agents or NSAIDs before onset of their symptoms, and infective etiology was excluded. ***Endoscopic findings*** were non-specific, and they included "normal" mucosa or mild edema, patchy erythema and small hemorrhages.

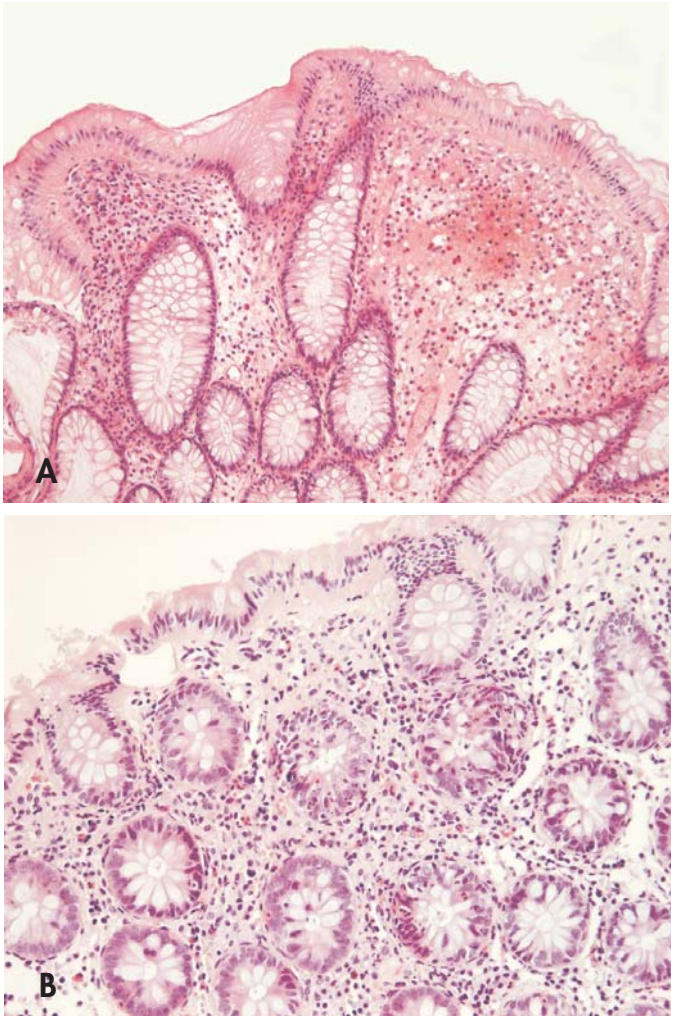

Fig. 1. Histologic findings after the polyethylene glycol preparation: (**A**) typical changes seen in all biopsies included mucosal edema, hyperemia and fresh hemorrhage, (**B**) focal cryptitis was rare, being found in only two cases (HE, magnification x250).

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Four to six specimens were taken from the whole colon. The tissue samples were fixed in 10% formalin, processed routinely and stained with hematoxylin and eosin.

Histologically, all biopsies at colonoscopy exhibited mild mucosal edema, hyperemia and patchy fresh hemorrhages (Figure 1A). In specimens from 29 patients (73 %), increasing focal lymphoplasmocytic infiltration in the upper portion of the lamina propria was seen. None of the biopsy samples showed architectural crypt distortion, and the surface epithelium was always normal. Only in two women (21 and 29 years old, respectively) (5 %), one of the specimens contained a focal cryptitis, increased proliferation and apoptosis of the cryptal epithelium without erosions (Figure 1B).

Several studies have compared NaP with PEG procedures, but most of them have evaluated patient preference and bowel cleansing ability (1,8). Zwas et al. (6) reported a 24.5% incidence of aphtoid lesions and a 5.6% incidence of focal active colitis (FAC) in patients who received NaP for colonoscopic preparation compared with 2.3 % of aphtoid lesions for patients prepared with PEG (i.e., ten times less). Similar results were reported in other series (3-5). In contrast, Vanner et al. (2) in a group of 102 patients who received either NaP or standard polyethylene glycol based solution did not find any histological difference between the two agents. However, in their study only the mucosa adjacent to polyp specimens was examined and not segmental mucosal biopsies taken from numerous locations in the colon.

In conclusion, our findings show that PEG (Fortrans) induced a less pronounced colorectal mucosal injury in comparison with NaP (in spite of the fact that NaP is better tolerated by patients). Although mild mucosal abnormalities including edema and hemorrhage occurred in all patients of both groups, NaP was associated with increased incidence of FAC (11.9 % in our previous study (7) *versus* 5 % of patients receiving Fortrans in this series). Mucosal erosions seen after NaP were not found in patients prepared with Fortrans. Thus, our findings are more close to those published results which support the lesser aggressiveness of PEG (in comparison with NaP) for colonic mucosa (3–6).

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