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Intestinal preparation prior to capsule endoscopy administration

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Abstract

In order to have an adequate view of the whole small intestine during capsule endoscopy, the preparation recommended consists of a clear liquid diet and an overnight fast. However, visualization of the small bowel during video capsule endoscopy can be impaired by intestinal contents. To improve mucosal visualization, some authors have evaluated different regimens of preparation. There is no consensus about the necessity of intestinal preparation for capsule endoscopy and it should be interesting to develop adequate guidelines to improve its efficacy and tolerability. Moreover, the effect of preparation type (purgative) on intestinal transit time is not clear. Since a bowel preparation cannot definitively improve its visibility (and theoretically the yield of the test), it is not routinely recommended.

Key words: Capsule endoscopy; Intestinal preparation; Polyethylene glycol; Aqueous sodium phosphate

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TO THE EDITOR

In order to have an adequate view of the whole small intestine during capsule endoscopy, it was initially thought that fasting for 12 h and a clear liquid diet 24 h prior to the procedure were an effective preparation. Based on this consensus, each group initiated this new technique, adapting it according to its own experience. Before long, it became evident that the capsule had two problems. One is the percentage of incomplete examinations is up to 15% of all those underwent capsule endoscopy due to a prolonged gastric or intestinal transit time[1], the other is the relatively frequent existence of intestinal content, particularly in its most distal parts of the small intestine. For these two reasons, it was thought that a preparation involving the cleaning of the small intestine prior to an examination would improve the quality of the endoscopic view and, in turn, the diagnostic yield of the technique. Thus, proposals were put forward based on the preparations carried out for other types of exploration, such as colonoscopy[2]. The application of such preparations has led to undesired effects such as the prolongation of gastric and/or intestinal transit time and a consequential rise in the proportion of incomplete examinations. To avoid such a negative outcome, trials have been carried out with prokinetics such as erythromycin, but achieved little effect[3,4]. In another prospective study, in which the prokinetic agent metoclopramide (10 mg) was administered orally 15 min before the capsule was swallowed, the percentage of complete studies was greater[5]. An extended transit time represents a less problem for the new generations of capsules whose batteries last longer. However, the use of metoclopramide could still offer advantages in diabetic patients and those confined to the bed, in whom intestinal transit time is usually longer, insuring that the capsule photographs the entire small intestine. Similarly, a better view of the proximal intestine has been described following administration of 300 mg simethicone 20 min before capsule endoscopy[6,7].

With respect to the preparation of the intestine before an examination, Viazis *et al*[8] carried out a prospective study of 80 patients to whom 2 L polyethylene glycol-based electrolyte solution (PEG) *vs* clear liquids was randomly administrated during the entire day prior to the procedure. No effect on the gastric or intestinal

transit of the endoscopic capsule was detected, though there was a higher level of cleanliness among those patients who received the aforementioned preparation, with a statistically significant improvement in the diagnostic yield. Niv *et al*[9] published a retrospective analysis of the use of oral sodium phosphate in 46 *vs* 23 patients prepared only with overnight fasting. The authors recommended the preparation of oral sodium phosphate after observing a higher level of cleanliness. However, it must be said that their study was retrospective and based on a relatively small series of patients whose results do not warrant a generalisation of the use of said preparation. Similarly, Dai *et al*[10] compared the levels of cleanliness obtained after ingestion of a 4 L PEG solution *vs* a 12 h period of fasting. They observed an acceleration of intestinal transit in patients receiving the PEG preparation, and a better view during the examination as a result of a greater intestinal cleanliness.

Ben-Soussan *et al*[11] did not observe a difference between a preparation of 2 L PEG solution and 12 h fasting with respect to the results achieved. Indeed, they reported that the PEG preparation increased the time of gastric emptying, which does not favour a complete small bowel examination.

Some studies have demonstrated that bowel preparation has a negative influence on gastric emptying and intestinal transit time, though there is a lack of uniformity among their results. Moreover, there is also evidence for the absence of any influence over these parameters. In an attempt to establish some common guidelines, different proposals have been made regarding the best procedure to follow. In this way, a review of the related literature by de Franchis *et al*[12] drew attention to the fact that studies on the subject are scarce and provide inconsistent results. Their analysis highlighted the lack of uniformity both in the methodology of the studies and in the results obtained, and considered it was necessary to develop a large, multi-centre, random, prospective study that would confirm, definitively, the best procedure to follow with respect to preparation prior to capsule endoscopy.

We must not ignore the disadvantages of all types of preparation for cleaning the intestine prior to capsule endoscopy, given the low tolerance of patients to such procedures and the often consequential rejection of a test that, without said interference, would normally be perfectly tolerated. On the other hand, there are no validated scales that allow us to accurately quantify and compare the levels of intestinal cleanliness. This makes any comparison of results difficult and can often invalidate them.

Results such as those of Pons *et al*[13] and Lapalus *et al*[14] tilt the balance in favour of no prior preparation. Lapalus *et al*[14] compared the administration of aqueous sodium phosphate (ASP) *vs* clear liquids and did not observe any difference in the level of cleanliness or in visibility.

The results of the aforementioned Spanish group[13] are a fruit of a multi-centre, random, prospective study that compared the efficacy and tolerability of three different preparations applied prior to capsule endoscopy in a large sample of patients. Observers were blind to the type of preparation employed. The 291 patients included in the study were randomly divided into three groups. All were fasted for 10 h prior to capsule endoscopy. Group A received a liquid diet (CL) (4 L) that excluded strongly-coloured liquids and those with residues. Group B received 90 mL of ASP as part of an abundant diet of liquids. Group C received a solution of 4 L PEG. The examinations were evaluated globally according to four categories: poor, fair, good, and excellent (Table 1). No statistically significant difference was found between the qualities of the examinations following the three preparations. The CL preparation was the best tolerated of the three preparations, followed by that of PEG and, finally, that of ASP ($P < 0.001$). The type of preparation did not influence the diagnostic yield of capsule endoscopy. Next, 32 examinations were randomly selected and re-evaluated by two researchers who were blind to the first result of a medium concordance between the first and second results (kappa 0.45).

Table 1 Score used to evaluate the level of intestinal cleanliness

Categories	Evaluate the level of intestinal cleanliness
Poor	Intestinal content impeding evaluation
Fair	Liquid or solid intestinal content allowing evaluation
Good	No intestinal content or some located in the terminal ileum and/or cecum
Excellent	No intestinal content in any part of the small intestinal tract (including ileum) or the cecum

This is the first study (currently being prepared for publication) that resolved the problem of preparation for capsule endoscopy. Based on the results, and pending verification by other studies, we can affirm that a liquid diet during the day prior to administration of the endoscopic capsule, together with fasting, constitutes a sufficient preparation for achieving a good level of cleanliness in the small intestine. Furthermore, this procedure is well tolerated and, thus, better accepted by the patient.

However, if in the future a product is developed that is capable of maintaining an adequate level of cleanliness in both the small intestine and colon, and which is also well tolerated by the patient, the recommended protocol for carrying out these diagnostic tests will no doubt be modified in order to incorporate the said product, not only in the case of capsule endoscopy but also in colonoscopy, in which preparation continues to be a stumbling block.

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