CrossMark

Bowel preparation: defining adequacy and improving metrics

doi:10.1136/flgastro-2016-100701

Philip Hendy

Philip Hendy reviewing Clark *et al.*¹

This prospective open-label study stratifies adenomatous polyp 'miss rates' by means of a second-look colonoscopy according to the quality of bowel preparation (using a validated bowel preparation scoring system). The study defines minimum standards that should be met, thus clarifying which patients should receive an additional colonoscopy due to inadequacy of bowel preparation.

Colonoscopy is routinely used in the screening and surveillance of colorectal cancer and is effective at reducing incidence and mortality (mortality ratio 0.47).² The aim being to detect cancers at an earlier stage (survival is over 90% when detected early) and to remove adenomas before they progress to malignancy. Inadequate bowel preparation leads to missed lesions, while lack of confidence about what constitutes acceptable preparation leads to inappropriately shortened intervals of colonoscopy. Little work has been done, however, to define the minimum standards needed for an examination to be acceptable and below which repeat investigation would be mandatory.

This prospective, non-randomised, partially blinded study was based in a single medical centre (a veterans' male only hospital) in the USA. Consecutive patients between the ages 50 and 75 undergoing screening or surveillance colonoscopies were invited to participate. Exclusion criteria included prior bowel resection, antithrombotic therapy usage, American Society of Anesthesiologists class 3 or higher functional status and familial polyposis syndromes. A pool of four study endoscopists performed

all the procedures, but in some cases, fellow participation was allowed. The study endoscopists had received prior training in Boston Bowel Preparation Scale (BBPS) scoring, and their intraobserver variation was tested prior to the study and was found to be very low. BBPS scores are calculated out of 9 as the sum of scores (0, 1, 2 or 3) for each of the three colonic segments (distal, transverse and right sided), with 0 indicating no mucosal visualisation; 1 indicating that some mucosa is visible and some is obscured; 2 indicating good mucosal views with some remaining streaking, fluid or bubbles and 3 indicating excellent unobscured mucosal views. The scores are calculated after washing. For each subject, a standard colonoscopy was performed, with intubation to at least the caecum and careful washing and inspection on withdrawal to optimise mucosal views. Identified polyps were removed (failure to remove led to exclusion from the study) and BBPS scores were calculated by the study endoscopist. A second-look endoscopy was performed within the next 2 months by a second study endoscopist, blinded to the results of the first endoscopy, who again calculated BBPS score and resected any detected polyps. Missed polyps were recorded as those detected on the second colonoscopy in a bowel segment with excellent bowel preparation (BBPS 3). Colon segments were excluded from analysis if the BBPS was <3 on the second colonoscopy.

The primary outcome of the study was non-inferiority of BBPS 2 versus BBPS 3 for the detection of adenomas >5 mm. Secondary outcomes included the same comparison but for all polyps >5 mm, small adenomas (<5 mm), advanced

adenomas (>10 mm, high-grade dysplasia or cancer), and also studied were differences between BBPS 1 and both BBPS 2 and 3.

A total of 815 subjects were enrolled into the study, of whom 438 completed the second colonoscopy within the specified timeframe, with 1161 colon segments available for analysis. The adenoma detection rate (ADR) of the endoscopists ranged from 67–74%. The primary study end point was met, with non-inferiority of BBPS 2 compared with BBPS 3 for per segment miss rates for adenomas >5 mm (5.6% and 5.2% respectively). A BBPS of 1, however, was inferior to both BBPS 2 and 3, resulting in an absolute increased miss rate for adenoma >5 mm of over 10% in both cases. Three hundred and forty patients had BBPS score 9 on their second colonoscopy, allowing per patient analysis in this group. There was an absolute increased risk of 13% of missed adenoma >5 mm in patients with any segment scoring BBPS 1 compared with those patients who scored BBPS 2 or 3 in all segments.

The authors acknowledge a number of study weaknesses, including the male-only population and the likely higher than average number of adenomas due to the sex and age of the recruits.

The study concludes that since BBPS 2 is non-inferior to BBPS 3 for detecting adenomas >5 mm, whereas BBPS 1 is inferior to both BBPS 2 and 3, any colonoscopy where a segment has BBPS ≤1 should be repeated, while any procedure with all segments BBPS 2 or 3 is acceptable and does not need repeat outside of the usual surveillance timescale.

Comments

Metrics are, quite rightly, an en vogue topic. Standardisation of descriptions and measurements from investigations improves reliability and decreases opportunities for miscommunication and misunderstanding. The BBPS is a validated score for describing the quality of bowel preparation and is probably underutilised in daily clinical practice. This well-powered and well-designed study delivers a clear message; namely BBPS 2 and 3 are acceptable, while BBPS 1 is not. This data may not be transferrable to other groups such as females, or younger or symptomatic patients

though. Indeed, the high ADR for the endoscopists reflects the age and sex of the subjects, and in groups with lower incidence of adenomas, the results might have rendered the differences less significant. In practice, however, the bulk of the patients undergoing colonoscopy are over 50 years old. It is Journal Watch's opinion that, even for groups with lower adenoma rates, the same principle of requiring a clear mucosa to obtain good views and hence improved pathology pick-up rates applies. Journal Watch recommends that the quality of colonic mucosal view should be reported in a standardised manner.

Twitter Follow Philip Hendy at @philiphendy14

Competing interests None declared.

Provenance and peer review Not commissioned; internally peer reviewed.

References

- 1 Clark BT, Protiva P, Nagar A, *et al.* Quantification of adequate bowel preparation for screening or surveillance colonoscopy in men. *Gastroenterology* 2016;150:396–405.
- 2 Zauber AG, Winawer SJ, O'Brien MJ, *et al.* Colonoscopic polypectomy and long-term prevention of colorectal-cancer deaths. *N Engl J Med* 2012;366:687–96.