

Investigating the frail elderly patient with lower bowel symptoms: what do we do now and can we improve?

KM Jamil, JH Jacomb-Hood and HM Fidler

ABSTRACT – Aims: To assess the utility of flexible sigmoidoscopy (FS) and minimal preparation CT (MPCT) in investigating lower gastrointestinal (LGI) symptoms in elderly patients who are too frail to undergo colonoscopy or spiral CT.

Methods: All FS examinations performed in patients aged over 70 between 1 January and 31 December 2008 were analysed. Predictors of usefulness were determined using multivariable analysis. In patients who also underwent MPCT, we analyzed the correlation between FS and MPCT.

Results: 426 FS were performed. Bowel preparation was inadequate in 24% of procedures. Indications in which FS was useful were: radiological abnormality (odds ratio [OR] 9.32), history of polyps (OR 4.54) and rectal bleeding (OR 1.73). Indications for which FS was least useful were: change in bowel habit (OR 0.22), diarrhoea (OR 0.46) and constipation (OR 0.38).

Conclusions: LGI investigation in frail elderly patients can be rationalised according to indication. Performing FS and MPCT together is not always necessary.

KEY WORDS: flexible sigmoidoscopy, minimal preparation CT, colonoscopy, rectal bleeding

Introduction

Colonic symptoms are common in the general population. Options for investigating these include flexible sigmoidoscopy (FS), colonoscopy, barium enema and contrast computer-tomography (CT) studies. Colonoscopy is seen as the ‘gold standard’ test for visualising the whole colon directly, excluding neoplasia and obtaining histological samples, but it might not be the best choice in the frail elderly. The risks of sedation, the patient’s ability to take and retain the bowel preparation and cope with the ensuing diarrhoea and dehydration, and the requirement to change position during the test must be carefully assessed, and other investigations considered.¹

In patients who are unlikely to tolerate colonoscopy safely or effectively, FS can be used with or without minimal preparation CT (MPCT). FS requires an enema only and is performed without sedation. Preparation for MPCT requires 700 ml oral

contrast without laxative the night before and another 700 ml oral contrast on the day of the examination. This technique has a sensitivity of 85–90% for detecting advanced neoplasia.^{2–5} MPCT allows views of the whole colon, which are poorer than those provided by CT colonography or colonoscopy, and have resulted in patients often having FS as well.

Objectives

The aim of this study was to investigate the utility of flexible sigmoidoscopy as a diagnostic tool in the assessment of frail older patients with colonic symptoms who were not perceived to be medically fit for colonoscopy or spiral CT colonography. We evaluated the indications, yield of positive findings and patient tolerance of FS and examined whether FS findings correlate with those from imaging. In particular, we assess whether FS is useful at all for this discrete and vulnerable population, and if so, in what situations.

Methods

Patient selection

We reviewed all flexible sigmoidoscopies performed in patients over 70 years between 1 January and 31 December 2008 in University Hospital Lewisham. Information was collected prospectively using an endoscopy database. Data that were analysed included: age, gender, indication for procedure, patient’s American Society of Anesthesiologists (ASA) grade, adequacy of preparation, extent of examination, endoscopic diagnosis and need for further lower GI investigation.

Key points

- 1 There is a need to rationalise lower gastrointestinal investigations in elderly patients who are too frail to undergo colonoscopy or CT colonography.
- 2 Flexible sigmoidoscopy (FS) is a useful investigation for rectal bleeding, but not for most patients with a change in bowel habit.
- 3 Minimal preparation CT (MPCT) is a well-tolerated and useful tool to examine the proximal colon.
- 4 A combination of FS and MPCT allows safe and practical investigation of lower GI symptoms, and detects advanced neoplasia.

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Table 1. Baseline characteristics and indications for flexible sigmoidoscopy.

Total number of FS		426
Mean age in years (SD)		79.2 (6.17)
Female n (%)		220 (59)
O/P n (%)		360 (85)
Indication n (%)	Rectal bleeding	163 (38)
	Change in bowel habit	91 (21)
	Abdominal pain	65 (15)
	Diarrhoea	60 (14)
	Constipation	55 (13)
	Anaemia	42 (10)
	Abnormality on imaging	35 (8)
	History of polyps	26 (6.1)
	Weight loss	25 (5.8)
	Anal symptoms	14 (3.3)
	Volvulus	12 (2.8)
	Incontinence	8 (1.9)
	Mass per rectum	5 (1.2)
	Tenesmus	5 (1.2)
	Mucus discharge	4 (0.9)
	Family history of cancer	3 (0.7)
	Follow-up of cancer	3 (1.7)
	Abdominal mass	3 (0.7)
	Assessment of ulcerative colitis	3 (0.7)
	Malaena	3 (0.7)
	Exclusion of extramammary pagets	2 (0.5)
ASA grade* n (%)	I	51 (12)
	II	279 (65)
	III	95 (22)
	IV	1 (0.2)

*ASA grade: I = healthy patient, II = mild systemic disease, III = severe systemic disease, IV = acutely unstable symptoms.

Evaluation of the flexible sigmoidoscopy

The cases were reviewed by two gastroenterologists who determined the FS as 'useful' or not according to the following criteria:

- FS was *useful* if there were positive findings that explained the indication or if there were negative findings that adequately excluded pathology *and* no further lower GI tests were required (as determined by the requesting physician).
- FS was considered *not useful* if the findings (positive or negative) did not adequately explain the indication and further LGI investigations were required (again, determined by the requesting physician).

In order to test the hypothesis that FS is not required to evaluate the left colon in patients who undergo cross-sectional imaging (MPCT), we assessed the correlation between MPCT and FS findings. Finally, we looked at whether any patient was diagnosed with left-sided colon cancer subsequent to the study period (up to the end of 2011).

Statistical analysis

Descriptive statistics are shown as mean \pm standard deviation (SD) as appropriate. Comparisons between groups were made using the χ^2 test or Fischer exact test for qualitative data. Comparisons of means were calculated using Welch's unpaired t-test. The yield for flexible sigmoidoscopy for different indications was calculated. To evaluate the effect of the different independent variables on the binary outcome 'useful' a logistic regression was used. This step was followed by the corresponding multivariate logistic regression in order to adjust the effects of confounders and interactions among independent variables. Independent variables with a p value of less than 0.1 in the univariate analysis were included in the multivariate analysis.

Results

A total of 426 flexible sigmoidoscopies were performed in 376 patients over the study period. There were 220 females (59%) and the mean age was 79.2 years. The baseline characteristics and indications for the procedures are shown in Table 1. The majority of procedures were performed in the outpatient (O/P) setting (85%), and the most common indications were rectal bleeding, change in bowel habit, abdominal pain, diarrhoea and constipation. Multiple indications were recorded for 156 procedures (37%). The majority of patients (87%) were classified as ASA grade II or III.

Flexible sigmoidoscopy findings

Table 2 depicts the findings at flexible sigmoidoscopy. Bowel preparation was inadequate in 24% of procedures and in 47% of procedures the examination did not reach the descending colon. A normal examination or no diagnosis was noted in 41% of procedures, resulting in an overall yield of positive findings of 59%. Polyps were the most common positive finding (20%); 25 cancers were found (5.9%) and other diagnoses included inflammation, diverticular disease and haemorrhoids.

No further investigations were required in 210 cases (49%). Table 3 lists the further investigations requested in the remainder of procedures. The most common were CT scan (30%), colonoscopy (8%) and barium enema (8%).

Predictors of a useful procedure

Flexible sigmoidoscopy was a useful procedure in 199 cases (47%). The breakdown of useful procedures by indication is shown in Table 4, with corresponding univariate p-values. Table 5 shows the

multivariate analysis for those variables that were significant in the univariate analysis. FS was most useful when the indications were: radiological abnormality (OR 9.32, 95% CI 3.04–28.56), history of polyps (OR 4.54, 95% CI 1.58–13.04) and PR bleeding (OR 1.73, 95% CI 1.09–2.74). By contrast, indications for which FS was least likely to be useful were: change in bowel habit (OR 0.22, 95% CI 0.12–0.41), diarrhoea (OR 0.46, 95% CI 0.24–0.88) and constipation (OR 0.38, 95% CI 0.19–0.73).

Correlation between MPCT and FS findings

Of the patients who underwent flexible sigmoidoscopy, 131 also underwent MPCT. Of these there was correlation between the findings of the two investigations in 79 cases (60%). In 32 cases (24%), there were positive findings on FS that were not seen on CT. The majority of these findings were diverticular disease (15/32) and polyps (13/32), none of which were larger than 8 mm in diameter. No cases of left-sided cancer were missed by CT. In 20 cases, there were positive CT findings that were not seen on FS, all of which were diverticular disease, thickened bowel or both (Table 6). Two patients have been diagnosed with left-sided colon cancer subsequent to the study (mean time from FS to diagnosis was 30 months). Neither patient had had a 'useful' FS according to our criteria, and one had undergone MPCT during our study period.

Discussion

Investigating lower gastroenterological symptoms in the frail elderly populations presents a challenge to clinicians. Whilst it is important to exclude significant pathology such as cancer, it is sensible to adopt a pragmatic approach to minimise risk and patient discomfort. Colonoscopy is the gold-standard investigation, but the risk of adverse events increases with age and comorbidity.^{6–8} In addition, poor tolerance of preparation often results in an incomplete examination of these patients.⁹

In the present study, we found that flexible sigmoidoscopy is a safe initial investigation for elderly patients who present with specific lower gastrointestinal symptoms. Our data demonstrate that FS is a useful investigation in patients who present with PR bleeding, have a history of polyps or have a radiological abnormality in the left-sided colon. However, nearly half the procedures (47%) did not reach the descending colon, and would be considered incomplete examinations. This reflects poor preparation (in 24% of patients) and highlights the difficulties in performing even limited endoscopy in this cohort.

This study also confirms previous findings that FS alone is not a useful investigation for patients presenting with constipation, diarrhoea or change in bowel habit.^{10,11} This is largely because a negative FS does not exclude right-sided colon pathology (such as malignancy), thus necessitating further investigation by either radiology or colonoscopy.

We acknowledge the retrospective nature of this analysis, but feel that these data reflect real everyday clinical practice, and provide an important insight into clinical decision-making.

Table 2. Flexible sigmoidoscopy findings.

Bowel preparation n (%)	Good	132 (31)
	Adequate	136 (32)
	Fair	18 (4)
	Poor	41 (10)
	Solid stool	58 (14)
	None given	10 (2)
	Not commented	31 (7)
	Site reached n (%)	Caecum
	Hepatic flexure	2 (0.5)
	Transverse colon	56 (13)
	Splenic flexure	64 (15)
	Descending colon	101 (24)
	Proximal sigmoid	57 (13)
	Distal sigmoid	58 (14)
	Rectosigmoid junction	39 (9)
	Rectum	16 (4)
	Abandoned before insertion	31 (7)
Diagnoses n (%)	Anastomosis	1 (0.2)
	Normal	123 (29)
	Polyps	84 (20)
	No diagnosis recorded	50 (12)
	Cancer	25 (6)
	Inflammation	25 (6)
	Other	23 (5)
	Diverticular disease	21 (5)
	Haemorrhoids	14 (3)
	Colitis or proctitis	13 (3)
	Volvulus	9 (2)
	Angiodysplasia	4 (1)
	Blood	2 (0.5)
	Stricture	1 (0.2)

Importantly, this study demonstrates the utility of MPCT in the frail elderly population. MPCT requires minimal preparation, allowing the right colon to be imaged in those patients too frail to undergo colonoscopy. Previous studies have demonstrated this technique to have high sensitivity (85–90%) and specificity (90–95%) in detecting colorectal cancer.^{2–4} Moreover, published data have shown MPCT to be well tolerated by the elderly who have difficulty with bowel preparation.⁵

We found that left colon findings on MPCT correlated with FS findings in 60% of cases. In the remainder of cases, no cancers were missed by CT. In CT-/FS+ cases, the majority of the positive FS findings were polyps and diverticular disease. No polyp was greater than 8 mm in diameter, and therefore all were of limited significance in this population. In three years of follow-up, two

Table 3. Further investigations ordered after flexible sigmoidoscopy.

Investigation	n (%)
Nil	210 (49)
CT	127 (30)
Barium enema	34 (8)
Colonoscopy	34 (8)
FS	16 (4)
Gastroscopy	15 (4)
Ultrasound scan	1 (0.2)
EUA	3 (0.7)
Rigid sigmoidoscopy	1 (0.2)

CT = computed tomography; EUA = examination under anaesthesia; FS = flexible sigmoidoscopy.

Table 4. Usefulness of flexible sigmoidoscopy.

	n	FS useful?	%	Univariate p-value
Female	242	111	46	NS
Male	184	88	47	
I/P	66	46	70	NS
O/P	360	153	43	
Indication				
PR bleeding	163	86	53	0.08
Change in BH	91	18	20	<0.0001
Abdominal pain	65	20	30	0.35
Diarrhoea	60	19	32	0.01
Constipation	55	18	33	0.001
Anaemia	42	12	29	0.11
Radiological abnormality	35	31	89	0.04
History of polyps	26	21	81	0.04
Weight loss	25	8	32	0.82
Anal symptoms	14	8	57	0.46
Volvulus	12	12	100	0.0001
Incontinence	8	3	38	NS

BH = bowel habit, PR = painless rectal; NS = not significant.

Table 5. Multivariate analysis for predictors of usefulness of flexible sigmoidoscopy.

	Odds ratio	95% CI	p-value
Volvulus			
Constipation	0.38	0.19–0.73	0.004
Diarrhoea	0.46	0.24–0.88	0.02
Change in BH	0.22	0.12–0.41	<0.0001
History of polyps	4.54	1.58–13.04	0.01
Radiological abnormality	9.32	3.04–28.56	<0.0001
PR blood	1.73	1.09–2.74	0.02

BH = bowel habit; CI = confidence interval; PR = painless rectal.

Table 6. Comparison of minimal preparation CT and flexible sigmoidoscopy findings.

Total number	131
Correlation	79 (60%)
FS +/CT –	32 (24%)
Diverticular disease	15
Polyps	13
Inflammation	3
Haemorrhoids	1
Solitary rectal ulcer	1
Cancer	0
FS –/CT +	20 (15%)
Thickened/narrowed colon	11
Diverticular disease	13

FS+/CT– = positive FS findings, negative CT findings; FS–/CT+ = negative FS findings, positive CT findings.

new diagnoses of left-sided colon cancer were made. As these were both diagnosed more than two years after the FS, it is not possible to determine whether these were *de novo* cases or if they were missed by the FS (and MPCT in one case) performed during the study. As the adenoma to carcinoma sequence is thought to be more than 3–5 years,¹² however, one could speculate that polyps could have been missed in these cases.

Conclusions

We have found that 24% of frail elderly patients in our department do not achieve adequate bowel preparation for FS, and in almost half, no view is obtained proximal to the sigmoid colon. By contrast, MPCT missed no cancers or significant polyps in this cohort. Our results suggest that a reasonable approach to initial lower GI investigation in frail elderly patient with colonic symptoms is FS in those with PR bleeding and MPCT in those with other indications, including change in bowel habit. This strategy will encourage a rational choice of either FS or MPCT as a first investigation in those patients for whom it is most likely to be useful and definitive, and might prevent unnecessary investigation. Such an approach is only indicated for patients for whom colonoscopy or CT colonography is high risk or unlikely to be tolerated.

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