

AUDIT

Evaluation of flexible sigmoidoscopy as an investigation for "left sided" colorectal symptoms

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Background: Colonoscopy is the best way of imaging the colon with concurrent biopsy and treatment. However it is expensive, requires full bowel preparation, and carries a risk of complications. Flexible sigmoidoscopy is an alternative way to investigate symptoms that raise the suspicion of a lesion of the rectum or left colon.

Aim of the study: To evaluate flexible sigmoidoscopy as the main investigation for "left sided" colorectal symptoms.

Methods: The clinical records of 317 patients who were assessed at a colorectal specialist clinic and were thought to have a suspicion of a lesion of the rectum or left colon were retrospectively reviewed. All patients had flexible sigmoidoscopy as the primary investigation. Primary outcome was the diagnostic yield of flexible sigmoidoscopy and secondary outcomes were any additional colonic investigations required, failure rates, and complication rates.

Results: Three hundred and sixteen patients who had flexible sigmoidoscopy with the above criteria were retrospectively analysed. Twenty four procedures (7.6%) had to be abandoned because of poor bowel preparation. The examination was considered complete when it reached the splenic flexure, which was the case in 205 cases (65%).

In 137 flexible sigmoidoscopies (43.3%) there were no abnormal findings. Of the remaining 179 a carcinoma of the rectum or colon was found in 28 cases (8.8%) and one or more polyps was found in 57 (18%) cases. On the basis of the findings it was calculated that 31% of the patients would require an additional investigation for further imaging of the right colon.

Discussion: Although flexible sigmoidoscopy has a high yield of pathologies when carried out by a specialist colorectal clinic, the presence of those pathologies makes the full imaging of the whole colon with an additional investigation necessary. Therefore the cost efficiency of flexible sigmoidoscopy is questionable. Although flexible sigmoidoscopy is indicated for certain patients, it cannot replace colonoscopy as the main investigation used by a specialist colorectal clinic.

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Colonoscopy is considered the most efficient method for combining optimum imaging of the full colon, biopsy, and therapeutic intervention such as polypectomy. Along with those advantages, colonoscopy has certain disadvantages such as 1:500 to 1:1000 risk of colonic perforation and the need for full colonic preparation. Full colonic preparation is unpleasant for patients, particularly in the presence of old age, mobility problems, or incontinence. Certain patients are not suitable for colonic preparation because of renal or heart failure. Very elderly patients are at risk of dehydration and some need admission to hospital the night before the colonoscopy in order to receive intravenous fluids. Last but not least, colonoscopy is an expensive investigation.

Barium enema does not have any significant risks of colonic perforation, however it has all the above disadvantages of colonic preparation. It does not provide the potential for biopsy and concurrent therapeutic intervention and therefore its use is decreasing in specialist colorectal units.¹

Flexible sigmoidoscopy does not require full colonic preparation as it has been shown that preparation by phosphate enemas can give satisfactory imaging.² It also has a lower risk of complications than colonoscopy³ and it is less expensive because it both requires less endoscopic time and, more importantly, can be performed by non-medical staff. Nurse practised flexible sigmoidoscopy is now established in many UK endoscopy units with good results.^{4,5} Flexible sigmoidoscopy is considered capable of imaging the colon to the splenic flexure, and although there is an argument that there may be a recent shift of colorectal

cancers and polyps towards more proximal lesions, flexible sigmoidoscopy has the potential to image more than 55% of all colorectal lesions.⁶

Symptoms and signs that might indicate a pathological lesion of the left colon or rectum are passage of bright blood per rectum, tenesmus, left iliac fossa pain, increasing constipation, a palpable left iliac fossa mass, and rectal pain. Theoretically, flexible sigmoidoscopy should be an adequate investigation for the exclusion of malignancy or a polyp that lies in the left colon up to the level of the splenic flexure.

There are many reports in the literature evaluating flexible sigmoidoscopy as a screening tool for colorectal cancer, usually in combination with a faecal occult blood test.^{7,8} There is not enough literature on the value of flexible sigmoidoscopy after assessment of the patient in a specialist colorectal surgery department and clinical suspicion of "left sided" bowel symptoms. A study comparing flexible sigmoidoscopy with colonoscopy as an initial evaluation in children with colitis was inconclusive.⁹

Although in our practice colonoscopy is the preferred method of colonic imaging, we try to balance the risks and side effects of colonoscopy against the anticipated benefit to the individual patient. We are also limited by availability of resources and the need to keep the waiting time for colonoscopies within acceptable limits. We selectively perform flexible sigmoidoscopy instead of colonoscopy on those patients who have symptoms and signs suggesting pathology of the left colon and rectum. The decision is made after consultation at the colorectal surgery outpatient clinic.

This study aimed to evaluate flexible sigmoidoscopy as the initial method of colon imaging on patients with symptoms and signs suggesting pathology of the left colon or rectum after consultation at a specialist colorectal surgery clinic.

METHODS

This was a retrospective study of all patients who had a diagnostic first time flexible sigmoidoscopy for left sided bowel symptoms/signs after a consultation in our colorectal surgery outpatient clinic during a two year period. Therapeutic flexible sigmoidoscopy and follow up flexible sigmoidoscopy for previous colorectal pathology were excluded. We considered as left sided bowel symptoms one or more of the following: passage of bright blood per rectum, tenesmus, left iliac fossa pain, increasing constipation, a palpable left iliac fossa mass, and rectal pain. No age criteria were used.

The endoscopy records and clinical records of the detected patients were retrieved and analysed. Primary outcome was defined as a positive diagnosis and secondary outcomes were defined the subsequent colonic investigations required, the complication rates, and failure rates of flexible sigmoidoscopy.

RESULTS

Three hundred and seventeen patients who had flexible sigmoidoscopy with the above criteria were identified. One patient had incomplete records and was excluded, leaving 316 patients for study. Of those there were 168 males and 148 females. Only 98 patients (31%) required sedation for completion of the examination. All flexible sigmoidoscopies was performed by medical staff. Bowel preparation was considered to be poor to the point of affecting the reliability of the findings in 45 (14.2%) examinations. Twenty four procedures (7.6%) had to be abandoned because of poor bowel preparation. The examination was considered complete when it reached the splenic flexure, which was the case in 205 patients (65%) (table 1).

One hundred and thirty seven flexible sigmoidoscopies (43.4%) showed no abnormal findings. Of the remaining 179 a carcinoma of the rectum or colon was found in 28 cases (8.8%) and one or more polyps was found in 57 (18%) of cases. A detailed list of findings is shown in table 2.

A biopsy was taken in 74 cases (23.4%), a hot biopsy in 31 cases (9.8%), and a polypectomy was performed in 23 cases (7.3%). One rectal dilatation of stricture was also performed.

There were no complications and no mortality.

All patients were referred back to the colorectal surgical clinic for follow up and a decision regarding further investigations. A year after completion of the study there were no missed cancers or other serious pathologies.

DISCUSSION

In our study flexible sigmoidoscopy after clinic consultation had a high yield of positive findings (56.6%). It is also

Table 2 Findings of flexible sigmoidoscopy

	No (%) of cases
No abnormal findings	137 (43.4)
Diverticular disease	62 (19.6)
Polyps	
Single polyp	37 (11.7)
Multiple polyps	20 (6.3)
Carcinoma	28 (8.8)
Inflammatory disease	17 (5.3)
Other findings	27 (8.5)

encouraging that a relatively high rate of colorectal cancers and polyps was detected. This high yield was possible because of the previous consultation at a specialist clinic, and these results may not be applicable to the use of flexible sigmoidoscopy in a screening program or to flexible sigmoidoscopy organised by general practitioners. It is worth noting that there have been no complications.

However it appears that, in the same way as colonoscopy, flexible sigmoidoscopy can also result in a number of failed or poor quality examinations. In these cases the patient will have to be reassessed and often be obliged to undergo a further diagnostic procedure. The value of flexible sigmoidoscopy will therefore depend on the quality of the procedure, both in terms of being able to reach the splenic flexure and in terms of adequate enema preparation. Satisfactory bowel preparation without oral laxatives is not always easy to achieve in all cases because some patients suffer from chronic severe constipation.

On first review of our data we were surprised that in more than 35% of cases the flexible sigmoidoscope could not be advanced to the splenic flexure. Although some authors accept the descending colon as the point of completion of flexible sigmoidoscopy, the impression of the endoscopist regarding the point of advancement of the sigmoidoscope is not always reliable without the anatomic landmarks of the splenic flexure. Other authors report a high incidence of failure to reach the splenic flexure.¹⁰⁻¹¹ We therefore considered as complete only the flexible sigmoidoscopy that had reached the splenic flexure. A tight rectosigmoid junction can occasionally be the cause for abandonment of the procedure, however, we have not adjusted for other factors limiting the completion such as poor bowel preparation, severe diverticular disease (19% in our series), obstructing carcinoma, etc.

The detection of a tumour or polyp makes the imaging of the entire colon obligatory for the risk of the presence of synchronous lesions, which is reported to be as high as 30%.¹² This means that in our series more than 26% of the patients who had flexible sigmoidoscopy also required either a colonoscopy or a barium enema, unless they were medically unfit for bowel preparation.

If we add to the above figure the 5% of patients who were found to have inflammatory bowel disease and therefore also required a subsequent full colonoscopy it is obvious that one third of the patients who had flexible sigmoidoscopy will be obliged to have an additional colonoscopy. Other authors, particularly from the USA, have also found that flexible sigmoidoscopy may result in duplication of procedures.¹³⁻¹⁴ This is unpleasant for patients and duplicates the use of resources. This is a disappointing finding that needs to be taken into account when a hospital examines the possibility of setting up a nurse-led flexible sigmoidoscopy service. If a high number of flexible sigmoidoscopies had to be complemented by colonoscopy or barium enema the service might not be cost efficient anymore.

Table 1 Point of advancement of the instrument during flexible sigmoidoscopy

Point of advancement	No (%) of cases
Rectum	21 (6.6)
Sigmoid colon	90 (28.3)
Descending colon (splenic flexure)	152 (47.9)
Transverse colon	41 (12.9)
Ascending colon	6 (1.8)
Caecum	6 (1.8)
Not recorded	1
Total	317

On the other hand it could be argued that for the majority of those patients flexible sigmoidoscopy would be adequate, and the practice of flexible sigmoidoscopy for those patients who are too frail for full bowel preparation should be continued. The clinician's judgment on individual patients, as well as the local characteristics of the service in each unit, will play a part in the decision.

The routine addition of a barium enema to all flexible sigmoidoscopies has been shown to be less cost efficient than colonoscopy.¹⁵ Nurse practised colonoscopy is already established in a number of UK centres,¹⁶ and perhaps the cost efficiency of that service should be compared to that of nurse practised flexible sigmoidoscopy.

Cost and complications remain a problem for colonoscopy but this problem is difficult to solve in the medium term future. The rate of complications should be audited in each endoscopy unit and be kept to a minimum. However the risk of complications is more acceptable to patients who have been selected at a specialist clinic on the basis of symptoms suspicious for colorectal cancer than for asymptomatic participants of a screening programme.

Faecal calprotectin is an inflammatory marker that may be useful in selecting patients who have a higher risk for colorectal cancer and thus will limit the number of unnecessary colonoscopies.^{17,18}

In the long term future there are some promising results from imaging the colon with magnetic resonance imaging (MRI) colonography which uses MRI processed by virtual reality software to create three dimensional images of the colon.^{19,20} MRI colonography is currently expensive but as the cost of technology decreases it may represent an alternative for bowel imaging in the clinical practice of specialist units.

In conclusion our study has shown that flexible sigmoidoscopy can have a high yield of pathologies when used by a specialist colorectal clinic. However the presence of those pathologies renders the imaging of the rest of the colon necessary. Although flexible sigmoidoscopy still has a place in assessing certain patients, it is not cost efficient for generalised use and it cannot replace colonoscopy in a specialist colorectal clinic.

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REFERENCES

- 1 **Karasick S**, Ehrlich SM, Levin DC, *et al*. Trends in use of barium enema examination, colonoscopy, and sigmoidoscopy: is use commensurate with risk of disease? *Radiology* 1995;**195**:777-84.
- 2 **Preston KL**, Peluso FE, Goldner F. Optimal bowel preparation for flexible sigmoidoscopy—are two enemas better than one? *Gastrointest Endosc* 1994;**40**:474-6.
- 3 **Bini EJ**, Firoozi B, Choung RJ, *et al*. Systematic evaluation of complications related to endoscopy in a training setting: a prospective 30-day outcomes study. *Gastrointest Endosc* 2003;**57**:8-16.
- 4 **Schoenfeld PS**, Cash B, Kita J, *et al*. Effectiveness and patient satisfaction with screening flexible sigmoidoscopy performed by registered nurses. *Gastrointest Endosc* 1999;**49**:158-62.
- 5 **Wallace MB**, Kemp JA, Meyer F, *et al*. Screening for colorectal cancer with flexible sigmoidoscopy by nonphysician endoscopists. *Am J Med* 1999;**107**:286-7.
- 6 **McCallion K**, Mitchell RM, Wilson RH, *et al*. Flexible sigmoidoscopy and the changing distribution of colorectal cancer: implications for screening. *Gut* 2001;**48**:522-5.
- 7 **Olynyk JK**, Platell CF, Collett JA. Faecal occult blood and flexible sigmoidoscopy screening for colorectal cancer: modeling the impact on colonoscopy requirements and cancer detection rates. *J Gastroenterol Hepatol* 2001;**16**:389-92.
- 8 **Thiis-Evensen E**, Hoff GS, Saurav J, *et al*. Flexible sigmoidoscopy or colonoscopy as a screening modality for colorectal adenomas in older age groups? Findings in a cohort of the normal population aged 63-72 years. *Gut* 1999;**45**:834-9.
- 9 **Deutsch DE**, Olson AD. Colonoscopy or sigmoidoscopy as the initial evaluation of pediatric patients with colitis: a survey of physician behavior and a cost analysis. *J Pediatr Gastroenterol Nutr* 1997;**25**:26-31.
- 10 **Painter J**, Saunders DB, Bell GD, *et al*. Depth of insertion at flexible sigmoidoscopy: implications for colorectal cancer screening and instrument design. *Endoscopy* 1999;**31**:227-31.
- 11 **Stewart BT**, Keck JO, Duncan AV, *et al*. Difficult or incomplete flexible sigmoidoscopy: implications for a screening programme. *Aust N Z J Surg* 1999;**69**:19-21.
- 12 **Collett JA**, Platell C, Fletcher DR, *et al*. Distal colonic neoplasms predict proximal neoplasia in average-risk, asymptomatic subjects. *J Gastroenterol Hepatol* 1999;**14**:67-71.
- 13 **Rex DK**, Mark D, Clarke B, *et al*. Colonoscopy evaluations: justification by cost? *Am J Gastroenterol* 1996;**91**:614-5.
- 14 **Elwood JM**, Ali G, Schlup MM, *et al*. Flexible sigmoidoscopy or colonoscopy for colorectal screening: a randomized trial of performance and acceptability. *Cancer Detect Prev* 1995;**19**:337-47.
- 15 **Rex DK**, Mark D, Clarke B, *et al*. Flexible sigmoidoscopy plus air-contrast barium enema versus colonoscopy for evaluation of symptomatic patients without evidence of bleeding. *Gastrointest Endosc* 1995;**42**:132-8.
- 16 **Pathmakanthan S**, Murray I, Smith K, *et al*. Nurse endoscopists in United Kingdom health care: a survey of prevalence, skills and attitudes. *Adv Nurs* 2001;**36**:705-10.
- 17 **Kristinsson J**, Nygaard K, Aadland E, *et al*. Screening of first degree relatives of patients operated for colorectal cancer: evaluation of faecal calprotectin vs hemoccult II. *Digestion* 2001;**64**:104-10.
- 18 **Tibble J**, Sigthorsson G, Foster R, *et al*. Faecal calprotectin and faecal occult blood tests in the diagnosis of colorectal carcinoma and adenoma. *Gut* 2001;**49**:402-8.
- 19 **Lauenstein TC**, Goehde SC, Debatin JF. Fecal tagging: MR colonography without colonic cleansing. *Abdom Imaging* 2002;**27**:410-7.
- 20 **Lauenstein TC**, Goehde SC, Ruehm SG, *et al*. MR colonography with barium-based fecal tagging: initial clinical experience. *Radiology* 2002;**223**:248-54.