Uptake of population based flexible sigmoidoscopy screening: a nurse-led feasibility study

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Abstract

Objective - To assess uptake of once-only flexible sigmoidoscopy (FS) in a community sample to determine whether FS would be viable as a method of population-based screening for colorectal cancer.

Methods - All adults aged 60-64 registered at three General Practices in North West London, UK (510 men and women) were sent a letter of invitation to attend flexible sigmoidoscopy screening carried out by an experienced nurse, followed by a reminder if they did not make contact to confirm or decline the invitation. The primary outcome was attendance at the endoscopy unit for a flexible sigmoidoscopy test.

Results - Of the 510 people invited to attend, 280 (55%) underwent flexible sigmoidoscopy. Among non-attenders, 91 (18%) were ineligible for screening or did not receive the invitation, 19 (4%) accepted the offer of screening but were unable to attend during the study period, 52 (10%) declined the offer, 41 (8%) did not respond to the invitation, and 27 (5%) accepted the offer of screening but did not attend. Attendance among those eligible to be screened, who had received the invitation, was 67%. People from more socio-economically deprived neighborhoods were less likely to attend (OR=0.89; CI=0.83-0.96; p=0.003). Women were more likely to attend than men (OR=1.44; CI=1.01-2.04; p=0.041).

Conclusions - Attendance rates in this pilot for nurse-led, population-based flexible sigmoidoscopy screening were higher than those reported in other flexible sigmoidoscopy studies, and comparable to adherence with faecal occult blood testing in the UK FOBT pilot. Having a female nurse endoscopist may have been responsible for increasing female uptake rates but this warrants confirmation in a larger study.

Introduction

Colorectal cancer (CRC) is the second largest cause of death from malignancy in the UK and incidence has risen over recent years.[1] Survival rates in the UK are worse than the United States and some other European countries,[2;3] which has been attributed to later stage diagnosis in the UK. Unfortunately, CRC is often asymptomatic until an advanced stage, so by the time an individual detects a symptom, the potential for cure is greatly reduced.[4] Screening offers the opportunity to detect pre-cancerous stages as well as asymptomatic cancers, and therefore to reduce CRC mortality.[5]

Two methods of CRC screening are being evaluated in the UK: faecal occult blood testing (FOBT) and flexible sigmoidoscopy (FS).[6] FOBT is a self-administered test that examines the stool for blood which may indicate the presence of adenomas or cancerous growths. Randomised controlled trial results show that guaiac FOBT screening can reduce mortality from CRC by up to 33%. [7-9] A pilot study to assess the feasibility of a national FOBT screening programme was completed in 2002 in the UK and achieved an uptake rate of 57%;[10] similar to that found in randomised trials.[11] A national FOBT screening programme is being rolled out in the UK (www.cancerscreening.nhs.uk).

Flexible sigmoidoscopy screening examines the distal colon for adenomas, which are the precursor stage for colorectal cancers. It therefore has the potential to reduce CRC incidence as well as mortality. A single FS performed around age 60 has been argued to be a cost-effective method of reducing colorectal cancer incidence and mortality.[5;12-16] Efficacy data from randomised controlled trials (RCT) are not available but several trials

are underway,[17-19] and there is evidence that FS screening is safe,[20] acceptable to the public, [21] and does not have a detrimental impact on psychological wellbeing.[22]

For FS screening to be an effective public health tool, uptake rates need to approach those for FOBT, and this is likely to be challenging. Overall uptake in the context of the UK Flexible Sigmoidoscopy trial was comparatively low (39%), but this was a consequence of two-stage invitation procedure built into the trial design,[17] in which potential participants were initially asked if they would be likely to attend and were randomized only if they indicated they would attend. This was done in order to reduce non-adherence in the intervention group and thereby increase the statistical power of the intention-to-treat analyses. Achieved attendance rates were therefore likely to be substantially lower than would be anticipated if screening were well-publicised and all potential participants were invited for screening.[23]

A recent nationally representative survey of adherence to CRC screening in the US, showed sub-optimal uptake of 53%.[24] Interestingly, adherence was higher for endoscopy than FOBT, which indicates that the invasiveness of endoscopy is not necessarily a barrier. This is consistent with the finding that uptake of FS was slightly higher than for FOBT (47% vs. 42%) when people registered at a GP practice in the UK were randomized to receive one or the other. [25]

Unusually among preventive health behaviours, uptake of endoscopy has been observed to be lower among women than men.[26] This may be because the embarrassment associated with endoscopy is more of a barrier for women.[27] Although the gender

differences are small, reducing barriers to FS in women would improve uptake figures for the population as a whole. Women appear to prefer female doctors, while men often express no preference.[28;29] Because most gastroenterologists are male, this could contribute to the lower uptake rates in women. We reasoned that use of nurse endoscopists – who are more likely to be female - might facilitate uptake of FS screening among women. Workforce limitations in gastroenterology also make it likely that nurse endoscopists would lead any national FS screening service in the UK, and nurse practitioners have been shown to perform FS as safely and be as acceptable to patients as gastroenterologists.[30]

The purpose of the present study was to explore reactions to FS screening offered as a nurse-led service in a community setting. This study therefore represents the first assessment of attendance rates for flexible sigmoidoscopy delivered as a population-based screening service.

METHOD

Participants

Five hundred and ten people aged 60-64 years (48% male, 52% female), registered with one of three GP practices in North-West London, UK were invited to attend FS screening. GP practices were selected to be relatively close to St Mark's Hospital and to represent a range of deprivation and ethnic background. Data from the 2001 Census on ethnicity and deprivation were used to select the three practices. The Index of Multiple Deprivation ranks output areas in England from 1-32,482, where 1 represents the most deprived area. The selected GP practices were in output areas with IMD ranks of 8,223,

12,337 and 19,464, thus representing a range of deprivation. In terms of ethnicity, the GP practices were situated in areas with a White population ranging from 45-77%, which is significantly less than the average of 91% White for England and Wales.

Socioeconomic status (SES) was assessed using postcodes to generate Townsend Material Deprivation Index Scores[31] for each person's area of residence. A Townsend score of zero represents the average for England and Wales with higher scores reflecting greater deprivation. Ethical approval was granted by the Harrow Research Ethics Committee.

Invitation procedure

Potential participants were sent a 'flyer' informing them that screening would be available in their area (as a proxy for media publicity), followed by an information leaflet on FS screening and an invitation to attend the clinic with a specified appointment time around six weeks ahead. They were asked to confirm, change or cancel the appointment by returning a reply slip or telephoning the clinic, and to contact the clinic if they met any of the exclusion criteria listed on the information leaflet. The invitation letter came from the Endoscopy Unit at St Mark's Hospital but included a statement saying 'Your GP recommends bowel screening because it can help prevent bowel cancer and all patients at your GP practice between the ages of 60-64 will be offered this test'. GP endorsement has been shown to enhance colorectal screening uptake rates. [32;33]

The information leaflet, which explained the screening procedure and associated risks, came in two versions, one focusing on the benefits of attending screening ('gain-framed')

and one on negative consequences of declining screening ('loss-framed'). A second leaflet showed a cartoon-style, illustrated explanation of cancer development and polypectomy. The first 90 patients invited were sent a generic information leaflet without pictures. The next 420 patients were randomized to receive either the loss or gain-framed leaflet, with or without the illustrated leaflet. The impact of type of leaflet on attendance and patient understanding has been reported elsewhere (see [34;35]).

Two weeks before the appointment, individuals who had accepted the offer of screening were sent a confirmation of the appointment details and further explanation of the flexible sigmoidoscopy procedure. They were also sent an enema (Fletchers' Phosphate Enema 128ml) by post, along with instructions for self-administration. People who did not respond to the invitation within two weeks were either sent a letter asking them to contact the clinic to respond to their original appointment (the first 90 participants) or were offered a second appointment (the subsequent 420).

Screening and follow-up procedures

Patients were examined in the left lateral position. The examination began with a digital rectal examination. The examination was undertaken by a clinical nurse endoscopist using a 65 cm flexible sigmoidoscope connected to a colour VDU monitor. Carbon monoxide was used to insufflate the bowel. The sigmoidoscope was advanced as far as could be achieved without producing pain or stress to the patient; normally to just beyond the sigmoid colon - descending colon junction to view the distal descending colon. No sedatives or muscle relaxants were used.

Small polyps were removed during flexible sigmoidoscopy. Participants were referred for colonoscopy if they had polyps meeting any of the following high-risk criteria: diameter of 1cm or larger, three or more adenomas, tubulovillous or villous histology, severe dysplasia or malignancy, or 20 or more hyperplastic polyps above the distal rectum.

Assessment of uptake

Attendance rates were calculated in two ways: as a percentage of the total sample and as a percentage of the sample following exclusions. People were excluded from the denominator if it was confirmed that they had died, their contact details were incorrect, or they were out of the country for the duration of the study. They were also excluded if, as requested, they called the clinic to explain that they had: a) a recent (within 2 years) or scheduled endoscopic bowel investigation, b) bowel cancer, c) previous bowel surgery that would prevent effective sigmoidoscopy screening, d) ulcerative colitis, e) kidney failure, f) serious heart disease, or g) very poor general health.

Statistical analysis

Logistic regression was used to examine demographic predictors of attendance (gender and SES). One-sample t-tests were used to detect a significant deviation from zero for Townsend scores.

RESULTS

Uptake

Table 1 demonstrates the outcomes for the 510 participants invited to attend screening. A total of 280 attended for screening, giving a crude uptake rate of 55% (number who attended out of all those invited). A further 19 (4%) accepted the offer of screening but were not able to attend any of the remaining screening sessions (referred to as 'awaiting screening'); the majority of these had been invited at the end of the study period when there were few screening dates available and they will be re-invited in the next phase of the study. A total of 52 individuals (10%) declined the offer of screening outright whilst a further 27 (5%) initially accepted the offer of screening then cancelled their appointment or failed to attend. An additional 41 (8%) did not respond.

To create an 'eligible sample, 91 people (18%) were excluded for reasons given in Table 2, leaving a sample of 419. Around half of them were excluded because of incorrect contact details and a further 22% because of ongoing bowel investigations. Taking account of these exclusions, 67% (280/419) of eligible patients attended for screening.

In the sample as a whole, women were more likely to attend screening than men (59% vs. 50%; OR=1.44; CI=1.02-2.05; p=0.041), but they were less likely to be excluded from FS screening (OR=0.61; CI=0.38-0.96; p=0.033). In the eligible sample (n=419), the gender difference was reduced (69% vs 64%) and was no longer statistically significant (OR=1.26; CI=0.84-1.89). Gender differences in outcomes following exclusions (n=419) can be seen in full in Table 3.

Overall, the sample came from slightly less deprived neighborhoods than the average score of zero for England and Wales (Townsend Score of sample *M*=-0.47 (2.62),

t(482)=-3.94, p<0.001). There was a significantly lower attendance in individuals with higher Townsend deprivation scores both in the full sample (OR=0.90; CI=0.84-0.96; p=0.003), and the eligible sample (OR=0.87; CI=0.80-0.94; p<0.001).

Response rates at different stages of the invitation process

Table 4 outlines the responses to the initial stages of the invitation process. Of the 510 people invited, 232 (46%) responded to the first appointment. Six letters (1% of 510) were returned undelivered at the flyer stage. An invitation with a specified appointment was sent to the remaining 504 people and 226 responded (44% of 510). The 278 people (54% of 510) who did not respond to the initial invitation phase within 2 weeks were sent a reminder letter and 214 people responded (42% of 510).

In the second part of the study, people who did not respond to the reminder letter were sent a second invitation with a new appointment date. Of the 55 participants sent a second invitation, 23 responded (4% of 510), of whom 14 accepted the second appointment (3% of 510). There were 9 non-responders from the first part of the study (2% of 510) who were not sent second appointments.

DISCUSSION

The present study represents the first phase of a pilot study to examine the feasibility of nurse-led, population-based FS screening in the UK. Encouragingly, 55% of those invited attended screening with an additional 4% awaiting screening in the next round. When uptake rates were adjusted following exclusions, 67% of eligible participants attended for screening.

The uptake rates reported here are higher than have been reported in other studies of FS screening.[18;36] This may be because screening was presented as a service rather than a research study, and also because the entire study population was invited without the two-stage invitation procedure. The uptake rates are comparable to those reported in a demonstration study of FOBT screening[10] and consistent with findings from Italy, where participation rates for FOBT and FS screening were very similar.[37]

The uptake rates are encouraging because FS was offered without any publicity or promotion other than a postal flyer. It is reasonable to assume that awareness of FS would have been low because at the time of the study there was no CRC screening programme in place in the UK, although FOBT was set to start in 2006. It is likely that a national programme with associated publicity would be even more successful.

We found encouraging results with respect to gender differences in uptake, with eligible men almost as likely to attend as women (64% vs 69% respectively). As discussed earlier, previous studies have found that uptake of FS is higher in men than women, [19;33;36;38] representing a reversal of the usual gender bias in preventive health behaviours.[39] This reversal may be due to the particularly embarrassing nature of endoscopy, with women being more concerned about shame associated with investigations in that part of the body. Having a female nurse endoscopist in this pilot programme may have reduced this particular barrier, although there were no male endoscopists in the present study to compare uptake rates.

Analyses of socio-economic group differences are less encouraging. People living in more socio-economically deprived areas were more likely to decline the offer of screening or not respond to the invitation. Social class differences in the uptake of colorectal cancer screening have been well documented[40] and it is important that more work is done to ensure that implementing a national screening programme does not exacerbate inequalities in cancer deaths.

Conclusion

This report describes the first stage of a pilot study to investigate the feasibility of introducing FS screening for colorectal cancer in the UK. The results were encouraging in showing that uptake of FS in a community sample is comparable to that reported in large trials of FOBT screening. The use of nurses to deliver the screening was highly successful and may have contributed to increasing uptake rates among women.

Table 1 – Overall results of the invitation process

Outcome	**% of total sample**	**% omitting exclusions**
Attended	54.9 (280)	66.8 (280)
Declined	10.2 (52)	12.4 (52)
Awaiting screening	3.7 (19)	4.5 (19)
No response	8.1 (41)	9.8 (41)
Dropped out	5.3 (27)	6.4 (27)
Excluded	17.8 (91)	-
Total	100 (510)	100 (419)

NB: Percentages may not always sum to 100 due to rounding bias

Table 2 - Reasons for exclusion

Reason for exclusion	% (n)	% of exclusions
Incorrect contact details	9.2 (47)	51.6
Recent or pending bowel exam	3.9 (20)	22.0
Out of the country	1.2 (6)	6.6
Previous bowel surgery	0.8 (4)	4.4
Current poor health*	0.8 (4)	4.4
Ulcerative colitis	0.6 (3)	3.3
Deceased	0.6 (3)	3.3
Recent bowel cancer	0.4 (2)	2.2
Kidney failure	0.2 (1)	1.1
Recent heart attack	0.2 (1)	1.1
Total	18 (91)	100

* Two participants were in nursing homes and were not able to give informed consent, one was awaiting major surgery and another was acutely unwell, awaiting the results of hospital investigations.

Table 3 – Gender differences in uptake (% of eligible sample)

Outcome	Male Valid % (n)	Female Valid % (n)	Total Valid % (n)
Attended	64.1 (123)	69.2 (157)	66.8 (280)
Declined	16.1 (31)*	9.3 (21)*	12.4 (52)
No response	10.4 (20)	9.3 (21)	9.8 (41)
Dropped out	4.2 (8)	8.4 (19)	6.4 (27))
Awaiting screen	5.2 (10)	4.0 (9)	4.5 (19)
Total	100 (192)	100 (227)	100 (419)

* $p < 0.05$

Table 4 – Response rate to the invitation and reminder letters

Communication type	Participants sent communication % (n)	Accepted % (n)	Declined % (n)	Excluded % (n)	Responded % (n)	no response % (n)
Flyer	100 (510)	NA*	NA*	1.2 (6)	1.2 (6)	98.8 (504)
First appointment	98.8 (504)	33.5 (171)	2.5 (13)	8.2 (42)	44.3 (226)	54.5 (278)
Reminder letter	54.5 (278)	27.6 (141)	7.6 (39)	6.7 (34)	42.0 (214)	12.5 (64)
Second appointment	10.8 (55)**	2.7 (14)	0.0 (0)	1.8 (9)	4.5 (23)	6.3 (32)
Total	-	63.9 (326)	10.2 (52)	17.9 (91)	92.0 (469)	8.0 (41)

* Participants were not asked to respond to the flyer.
** 9 non-responders (from the first 90 invited) were not sent a second invitation

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