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Could stool collection devices help increase uptake to bowel cancer screening programmes?

[Poo-catchers for bowel cancer screening]

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Abstract

Objective

We aimed to understand the usage and acceptability of a faecal collection device (FCD) amongst participants of the NHS Bowel Cancer Screening Programme in order to influence future uptake.

Setting

Men and women completing faecal occult blood test (FOBt) retests as part of the routine Bowel Cancer Screening Programme in Eastern England.

Methods

A FCD and questionnaire was sent to all potential retest participants during a 1 month period collecting information on prior stool collection methods and ease of use and usefulness of the enclosed FCD.

Results

Of 1087 invitations to participate, 679 (62.5%) participants returned their questionnaire. Of these 429 (63.2%) trialled the FCD at least once. 163 (38.4%) found the device made collecting their sample easier than previously, with 189 (44.6%) finding it made collection more difficult and 72 (17.0%) feeling it made no difference. Similar numbers reported finding that the FCD made collecting the sample more pleasant (130, 31.5%), less pleasant (103, 25.0%) and no different (179, 43.4%) compared to previous collection without a FCD.

Conclusion

Although a small proportion of participants found the FCD helpful a considerable majority did not or did not use it at all. Offering FCDs is unlikely to produce a substantial increase in bowel cancer screening uptake.

Background

One of the biggest challenges to bowel screening programmes is promoting uptake. Numerous studies have identified one of the key concerns of potential participants to be the 'ick' factor, disgust at handling and storing their stool(1–4). Yet few, have investigated solutions to the problem.

The NHS Bowel Cancer Screening programme uses biennial guaiac faecal occult blood testing (gFOBt). Alongside a postal stool collection kit patients receive written advice of potential methods for stool collection. The importance of not contaminating the sample with toilet water is stressed, although the need to avoid urine is not discussed. It is known that participants use a wide variety of methods to collect stool specimens including retrieving stool from the toilet basin, using a household item (e.g. plastic food container), and newspaper or toilet paper(5).

One possible solution to this problem is the use of faecal/stool collection devices (FCDs). These aim to ease and improve sample collection through the provision of an external collecting container. There are a number of different devices on the market ranging from single use flushable paper based products to reusable moulded plastic designs.

Two studies have recently investigated the use of FCDs to increase screening uptake with mixed results (6,7). We aimed to understand the usage of a FCD amongst participants of the NHS Bowel Cancer Screening Programme in England in order to influence future uptake. Specifically a) determining the frequency of use and b) determining the reasons involved in the decision making process.

Methods

Patients and setting

The gFOBt NHS Bowel Cancer Screening Programme in England invites men and women aged 60-74 who are registered with an NHS general practice to complete a guaiac based FOB test every two years(8). Across England the process of invitation and kit testing is managed by one of five Hubs – the Eastern Hub is responsible for the initial management of participants in the East Midlands and East of England areas (total population ~11.0 million). Participants found to have abnormal tests are referred to their local Screening Centre for further assessment with most going on to have a colonoscopy. People whose FOB test proves to be normal are written to and advised that they will be sent another kit in 2 years provided they are still under the age of 75.

Initial invitations and test kits from the Eastern Hub are dispatched externally with the hub dispatching repeat test kits for participants requiring additional testing due to weak positive results. Current screening practice utilises the guaiac faecal occult blood process. Participants are sent a home testing kit by mail with instructions for returning 6 small stool samples from 3 consecutive bowel motions (details available <http://www.nhs.uk/Conditions/bowel-cancer-screening/Documents/kit-instructions.pdf>). No FCD is routinely included.

Patients with strongly positive results (5-6 out of 6 test windows positive) are referred for screening colonoscopy. Those with weak positive results (1-4 out of 6 positive) are offered repeat gFOBt up to twice (screening algorithm available in online appendix 1).

For this study, all participants requiring a 3rd test kit during October 2015 were included in the study. This allowed for participants assessment of both the FCD and comparison with the collection method used for previous kits. Additionally, it is known that more than 90% of retest kits are returned(9).

Faecal Collection Device

All participants were sent three FCDs (Poo-Catchers, Alpha Laboratories part FC2010) with the kit (one for each of their three samples). At the time of the study Poo-Catchers were 23p each (69p per subject). The Poo-Catcher is a paper loop which fits over the toilet seat and collects the stool. A sample can then be collected before the device is torn at either side, allowing it to fall into the toilet and be flushed away (details available at https://www.alphalabs.co.uk/media/productfile/file/f/e/fe-col_flyer_final_jun17.pdf and images available in appendix 2).

Questionnaire

Accompanying the test kit, Poo-Catcher and invitation letter to complete the 3rd kit, was a single page questionnaire, designed to capture the views of participants on the usability and usefulness of the faecal collection device. A copy is available in online appendix 3. The questionnaire could be returned with the completed test kit using the standard sample return process.

Analysis

A descriptive analysis of the survey results is presented. ChiSquared analysis of independence for sex differences in survey responses was calculated. All analyses were undertaken using Microsoft Excel 2016 and a p value of <0.05 was considered statistically significant.

Approvals

No formal approvals for this study were required as this work was considered health service audit.

Results

Patient characteristics

During the study period 1087 FCDs and questionnaires were sent with 1020 (93.8%) kits and 679 (62.5%) questionnaires returned. The 679 questionnaires form the analysis sample. Similar numbers of returned questionnaires were received from males and females (n=325 and n=346) respectively (with n=8 unknown).

Sample collection

Prior to the receipt of a FCD the most commonly used method of stool sample collection was with folded toilet paper (491, 72.3%), followed by use of a disposable container (103, 15.2%). Table 1.

With the provision of a FCD, 429 (63.2%) participants actually used the FCD for at least one of their three samples, with 181 (26.7%) using it for all three. Use by males and females was similar (60.0% and 66.2% ever used respectively).

Usability and usefulness

In general, participants found that the instructions for using the FCD easy to understand with 562 (82.8%) responding with either “very easy” or “quite easy” (83.1% and 82.4% for males and females respectively, $p=0.88$). Full responses in Table 1.

Of those participants using the FCD ($n=429$), 163 (38.4%) found the device made collecting their sample easier than previously, with 189 (44.6%) finding it made collection more difficult and 72 (17.0%) feeling it made no difference (5 patients did not answer). There was a notable difference (ChiSq $p<0.001$) between males and females with more males finding it easier (54.6% vs females 24.4%) and more women more difficult (57.8% vs males 28.9%). Similar numbers reported finding that the FCD made collecting the sample more pleasant (130, 31.5%), less pleasant (103, 25.0%) and no different (179, 43.4%) compared to previous collection without a FCD. Again a sex difference was evident (ChiSq $p<0.001$, Table 2).

When asked about willingness to pay for a FCD, 424 (70.2%) were not willing to pay for the device. 136 (22.5%) were willing to pay $<£1$, 44 (7.3%) more than $£1$, with a further 75 participants not responding.

Comments

387 free text comments were received and were summarised as three broad themes: i) positive comments regarding the helpfulness of the device, ii) preference for the old method and that FCD are not necessary, and iii) concerns around the devices fitness for purpose.

A selection of comments are included here. Comments were varied with some positive “brilliant idea”, “I found it much easier than before, it’s unpleasant to do but the device made it easier to do”. However the majority were negative “Tried glove, folded toilet paper, container and this device. I did not like your new idea at all. I prefer the container method.”, “The collection device split when I used first one, went into toilet and would not flush away. I did not try the device again.”, “Waste of time and money, toilet paper far easier and quicker”, “It is my opinion if people had to buy/pay they might not take part in the screening programme”, “Devices are a good idea but if you have a wee at the same time its no good, being a woman this happens most times”.

Discussion

Key findings

When provided free of charge to participants familiar with stool collection as part of the NHS Bowel Cancer Screening Programme more than a third were disinterested in trying the FCD. 63.2% were willing to try the FCD, with the majority finding it did not improve ease of stool collection (either no difference (17.0%) or had a negative impact (44.6%)). There was a clear sex difference in the perceived ease and usefulness with males being positive about the device and females negative.

Fit with existing literature

In the UK, White et al found the use of a FCD alongside a Cancer Research UK endorsement increased participation in the NHS Bowel Cancer Screening Programme from 43.4% to 45.1% amongst 60-69 year olds(7). However inclusion of the FCD was part of a multi-faceted intervention which included the addition of disposable gloves. In contrast a study of over 10,000 people in the

Netherlands found no difference in rates of participation in the national screening programme for participants randomised to screening with and without an FCD (uptake 52% in both groups)(6). This may in part reflect both the use of Faecal Immunochemical Test (FIT) in the Netherlands, which is easier to use requiring only a single stool sample, and also anecdotally the shape of European toilet pans (compared to those in the UK) is such that it makes stool collection easier.

The difference in perception of usefulness by sex is potentially explained by females more frequently than males needing to void urine at the same time as passing a bowel motion. Thus both contaminating the sample and weakening the FCD.

Strengths and limitations

The main strengths of this study relate to its high response rate (62.5%), a feature of the design that used participants who were both familiar with stool collection and had interest in completing their screening due to prior weak positive results.

A weakness is the lack of detailed information on non-responders such that external validity of the sample may be limited. However, from experience, we have no reason to believe responders and non-responders at this stage of the screening programme are notably different. The addition of the questionnaire and FCD did not impact screening participation with the kits return rate of 93.8% consistent with that expected at this stage of the screening programme.

Conclusion

Although a small proportion of participants found the FCD helpful a considerable majority did not or did not use it at all. Offering FCDs is unlikely to result in much increase in bowel cancer screening uptake.

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Contributions

JRM and AB performed the literature search. AB, CC and RFL designed the study. JRM and AB designed the analysis plan, prepared and analysed the data. JRM wrote the manuscript. All authors contributed to data interpretation, critically reviewed the manuscript, revised the manuscript and approved the final version.

Conflicts of interest

The Authors declare that there is no conflict of interest

References

1. Deutekom M, Rossum LGM van, Rijn AF van, Laheij RJF, Fockens P, Bossuyt PMM, et al. Comparison of guaiac and immunological fecal occult blood tests in colorectal cancer screening: The patient perspective. *Scand J Gastroenterol*. 2010 Nov 1;45(11):1345–9.
2. Reynolds LM, Consedine NS, Pizarro DA, Bissett IP. Disgust and Behavioral Avoidance in Colorectal Cancer Screening and Treatment: A Systematic Review and Research Agenda. *Cancer Nurs* [Internet]. 2013;36(2). Available from: http://journals.lww.com/cancernursingonline/Fulltext/2013/03000/Disgust_and_Behavioral_Avoidance_in_Colorectal.6.aspx
3. O’Sullivan I, Orbell S. Self-Sampling in Screening to Reduce Mortality from Colorectal Cancer: A Qualitative Exploration of the Decision to Complete a Faecal Occult Blood Test (FOBT). *J Med Screen*. 2004 Mar 1;11(1):16–22.
4. Chapple A, Ziebland S, Hewitson P, McPherson A. What affects the uptake of screening for bowel cancer using a faecal occult blood test (FOBT): A qualitative study. *Soc Sci Med*. 2008 Jun;66(12):2425–35.
5. Ahlquist DA. A Stool Collection Device: The First Step in Occult Blood Testing. *Ann Intern Med*. 1988 Apr 1;108(4):609.
6. Denters MJ, Deutekom M, Bossuyt PM, Fockens P, Dekker E. A feces collection paper does not enhance participation in a fecal immunochemical test-based colorectal cancer screening program: randomized clinical trial. *Eur J Cancer Prev* [Internet]. 2013;22(4). Available from: http://journals.lww.com/eurjcancerprev/Fulltext/2013/07000/A_feces_collection_paper_does_not_enhance.2.aspx
7. White B, Power E, Ciurej M, Lo SH, Nash K, Ormiston-Smith N. Piloting the Impact of Three Interventions on Guaiac Faecal Occult Blood Test Uptake within the NHS Bowel Cancer Screening Programme. *BioMed Res Int*. 2015;2015:1–11.
8. Logan RFA, Patnick J, Nickerson C, Coleman L, Rutter MD, von Wagner C. Outcomes of the Bowel Cancer Screening Programme (BCSP) in England after the first 1 million tests. *Gut*. 2012 Sep 7;61(10):1439.
9. Weller D, Coleman D, Robertson R, Butler P, Melia J, Campbell C, et al. The UK colorectal cancer screening pilot: results of the second round of screening in England. *Br J Cancer*. 2007 Dec 17;97(12):1601–5.

Tables and figures

Table 1. Stool collection methods (all participants)

	Male (n=325)	Female (n=346)	Total (n=679) ¹
Usual/previous collection method²			
Folded Toilet Paper	73.8% (240)	71.4% (247)	72.3% (491)
Disposable Container	11.4% (37)	18.5% (64)	15.2% (103)
Folded Newspaper	2.5% (8)	0.9% (3)	1.6% (11)
Plastic bag or glove	7.4% (24)	6.4% (22)	6.8% (46)
Other	5.5% (18)	5.5% (19)	5.4% (37)
Ease of understanding of FCD instructions³			
Very easy	54.5% (177)	48.3% (167)	51.4% (349)
Quite easy	28.6% (93)	34.1% (118)	31.4% (213)
Not easy	6.5% (21)	7.2% (25)	6.8% (46)
Difficult	1.2% (4)	2.3% (8)	1.8% (12)
Very confusing	0.9% (3)	0.6% (2)	0.7% (5)

FCD faecal collection device; values are % of responses (number)

¹ n=8 participants of unknown sex

² n=7 returned with no response, note: total >679 as more than one response category allowed

³ n=54 returned with no response, ChiSq test of independence $\chi^2=4.36$ df=4 p=0.88

Table 2. Use of the FCD among participants trialling the device

	Males (n=194)	Females (n=225)	Total (n=424) ¹
Ease of FCD use compared to prior method²			
Much easier	32.3% (63)	10.7% (24)	20.8% (88)
A little easier	22.2% (43)	13.8% (31)	17.7% (75)
No difference	16.5% (32)	17.8% (40)	17.0% (72)
More difficult	21.6% (42)	36.0% (81)	29.7% (126)
Much more difficult	7.2% (14)	21.8% (49)	14.9% (63)
Pleasantness of FCD use compared to prior method³			
Much less unpleasant	23.2% (45)	10.6% (23)	16.5% (68)
Slightly less unpleasant	18.6% (36)	11.9% (26)	15.0% (62)
No difference	40.7% (79)	45.9% (100)	43.4% (179)
More unpleasant	6.3% (26)	17.4% (38)	15.5% (64)
Much more unpleasant	4.1% (8)	14.2% (31)	9.5% (39)

FCD faecal collection device; values are % of responses (number)

¹ n=5 participants of unknown sex

² n=5 returned with no response, ChiSq test of independence $\chi^2=50.11$ df=4 p<0.001

³ n=12 returned with no response, ChiSq test of independence $\chi^2=26.70$ df=4 p<0.001