PB-PG-0408-16026 – NIHR Research for Patient Benefit Programme – Final report

Project title: Diet and Physical Activity to Prevent Recurrence of High Risk Adenomas: A feasibility study

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Plain language summary

Most colorectal (large bowel) cancers arise from polyps or adenomas, and high-risk adenomas are the most likely to become cancerous. The recurrence rate for high-risk adenomas is approximately 40% after three years. The recent World Cancer Research Fund report in 2007 concluded that high dietary red and processed meat and low levels of physical activity cause colorectal cancer.

The aim of the proposed study was to demonstrate the feasibility of altering the behaviour of patients recently diagnosed with high-risk adenoma. This study was intended to reduce the recurrence of high-risk adenoma and designed to (i) reduce consumption of red meat and eliminate processed meat from the diet (ii) increase physical activity levels.

If the results of this study confirmed that lifestyle change was of interest to these patients and could be delivered, the intention was that a future trial would aim to demonstrate that such behaviour change can actually reduce recurrence of high-risk adenomas.

The first stage of the proposed study included qualitative research to assess patients' preferences for feasible interventions aimed to bring about behaviour change, a postal questionnaire survey and a review of published evidence. Results of this stage were assessed in the second phase to determine the most effective ways of delivering the interventions. The third phase was intended to be a trial with 200 newly diagnosed high-risk adenoma patients. Groups were asked to either reduce red meat intake and eliminate processed meat, increase physical activity levels, both, or change nothing. Behavioural change, compliance and acceptability were assessed at six and 12 months.

Patient recruitment at our original site was very slow. We opened two more sites to see if the problem was local or universal. All three sites struggled to recruit patients. Over two years, only 49 patients took part. Many of the patients we recruited appeared to make successful changes in their diet and/or exercise. However, the main finding was that most of this patient group do not want to take part in a study to change their lifestyles (diet and/or exercise). Therefore, our conclusion is that a radically different recruitment approach is needed in order for researchers to succeed in engaging a representative sample of this population to any future definitive trial demonstrating that adenoma recurrence can be reduced by lifestyle changes.

Keywords

cancer, feasibility, research design, prevention, colorectal, primary care, bowel screening programme, behavioural change

Summary of research findings

Background

Colorectal cancer (CRC) is the third most common cancer and second most common cause of cancer death in the UK. The NHS Bowel Cancer Screening Programme aims to detect early-stage CRC and adenomas (pre-cancer) and thus improve survival. Most cases of CRC arise from adenomatous polyps and malignant potential is greatest in high risk adenomas. The recurrence rate for high-risk adenomas is approximately 40% after three years. The recent World Cancer Research Fund report (2007) concluded there was convincing observational evidence that high dietary red and processed meat and low levels of physical activity cause CRC. However, no definitive randomised trial has demonstrated the benefit of behaviour change on reducing polyp recurrence and no consistent advice is currently offered to minimise patient risk. This study aimed to assess patients' preferences for dietary and physical activity interventions and ensure their appropriate and acceptable delivery to inform a feasibility trial.

Aims and objectives

The aim of the whole study was to demonstrate the feasibility of altering the behaviour of patients recently diagnosed with high-risk adenoma. Based on the results of our qualitative research and a systematic review we aimed to develop an intervention to (i) reduce consumption of red meat and eliminate processed meat from the diet (ii) increase physical activity levels.

Methods: Overview

PART 1

The first stage of the study included research to assess patients' preferences for feasible interventions aimed at bringing about behaviour change. Focus groups, interviews, a postal questionnaire survey and a review of published evidence were undertaken. The results were assessed in order to determine the most effective ways of delivering the interventions.

PART 2

It was intended that a RCT would be conducted involving 200 patients newly diagnosed with intermediate or high-risk adenoma (I/HRA). Groups were asked to either reduce red meat intake and eliminate processed meat, increase physical activity levels, both, or change nothing. Behavioural change, compliance and acceptability were assessed at six and 12 months. If the results of this study were successful, it was intended that a future trial would aim to demonstrate that such behaviour change can reduce recurrence of intermediate or high-risk adenomas CRC.

Key findings

PART 1: Development of the intervention

Patients aged 60–74 included in the National Health Service Bowel Cancer Screening Programme (NHSBCSP) were selected from a patient tracking database. After a positive faecal occult blood test (FOBt), all had been diagnosed with an intermediate or high-risk adenoma (I/HRA) at colonoscopy between April 2008 and April 2010. The focus groups, interviews and questionnaire studies were completed by November 2010. A thematic analysis was conducted and two main themes emerged from the interviews/focus groups: a) experiences of having polyps and b) changing behaviour. Participants had not associated polyp removal with CRC and most did not remember being given any information or advice relating to this at the time. Existing diet and physical activity levels are very diverse. There was a lack of readiness to change behaviour in many people in the target population. These

findings were confirmed in the subsequent questionnaire study and published in BMC Cancer.

A systematic review of similar trials to determine which factors were associated with recruitment and adherence found that most previous trials had been of poor quality, and reports did not generally include sufficient detail on interventions or adherence. However, the literature does indicate that most similar trials recruit a very small proportion of patients who are approached to take part (submitted to BMC Cancer for publication).

These findings informed the development of the trial protocol for Part 2 of the study.

PART 2: Feasibility RCT

Recruitment was much slower than anticipated. This was because many potential participants believed their diet and exercise were already acceptable and some potential participants were unwilling to change their lifestyle. At Wolverhampton, of the first 207 who were approached; only 30 consented. In an attempt to improve recruitment a second and third site were opened but each showed a similar recruitment pattern to our first site, suggesting that the problem is universal rather than local.

To try and improve recruitment further we received ethical approval to change our existing randomisation process to preferential randomisation. In the last few months of the study, those participants who were randomised to intervention were able to choose which intervention group they were put in. We hoped this would have a positive effect on recruitment, but it did not make much difference.

Data analyses

Participants provided follow up at different time points depending on when they were recruited. This resulted in low participant numbers across the three, six and 12 month follow up points. In order to maximise the follow-up data available, data at three or six months has been collated into a single variable. Participants who provided follow up data at 12 months also provided data at six months, so they have been included in the analyses. The 12 month follow up data for these participants has not been included as very few participants provided data at this time point. For missing data at follow up (i.e., three and six months follow up), the baseline observation carried forward approach has been adopted to maximise the data available in analyses.

Changes in outcomes from baseline to end of follow up were calculated and group differences analysed using independent t-tests. In the first analysis the control group was compared with all intervention group participants on all outcomes. In the second analysis

the control group were compared with the diet only and the diet and exercise groups on outcomes related to consumption of red meat, processed meat, weight and QoL. Thirdly, the control group were compared with the exercise only and the diet and exercise groups on outcomes related to physical activity, sitting time, weight and QoL.

Recruitment flow

A total of 356 patients were assessed for eligibility and of these 313 declined (209 (61.5%)) or were excluded The remaining 49/356 patients (13.7% of those assessed for eligibility) were randomised to one of four trial groups; control (n= 14), exercise only (n=9), exercise plus diet (n=16) or diet only (n=10). During the later stages of the trial the randomisation process altered such that participants were randomised to only two groups, control or (choice of) intervention (n=10/49). Of those randomised to the choice of intervention group two chose diet only, one chose exercise only and seven chose diet and exercise.

Participants' mean age was 66.5 years and mean BMI of 30.4. Most participants were male (69%) and lived in high deprivation areas (27/49: 55.1%). These data did not vary substantially by intervention group.

Follow up rates

27 participants were asked to provide follow up data at both 6 and 12 months. All of these participants provided data at 6 months. In those asked to complete follow up at 3 and 6 months only, all completed follow up for at least one outcome.

Intervention implementation

35 participants were allocated to receive an intervention. Eight participants did not receive any face to face or telephone consultations.

Comparison of the control group versus all intervention participants for all outcomes

At follow up, the control group (n=14) reported consuming significantly more grams of red meat per week (mean difference =319.1, 95% CI: 33.3 to 604.8, p=0.029) and participated in significantly less minutes of vigorous intensity physical activity per week (mean difference = -1192.6, 95% CI: -2085 to -299, p=0.01) than the intervention group (n=35).

Conclusions

This study has shown the practical, intellectual and emotional barriers to developing dietary and physical activity behaviour interventions in this population - in particular the need to tailor the intervention to individuals, the lack of knowledge about the aetiology of colon

cancer and the lack of motivation to change behaviour (to reduce risk, improve outcomes, enhance health). Some studies have succeeded in recruiting participants to diet and physical activity interventions, [Baker and Wardle 2002, Caswell et al 2009, Robb et al, 2010] but whether personalised interventions with a long-term impact on health behaviours can be delivered through the NHS is yet to be determined. We found a lack of awareness of the need to change and a lack of understanding about ways in which dietary modification could be achieved. Currently, colonoscopy services seek to reassure patients that polyps have been removed. However, this reassurance means that the significance of a polyp, a precursor to colon cancer, is often not understood by patients. It may be counterproductive to frighten patients into changing their behaviour. However, without a full understanding of the role of high-risk polyps in the aetiology of CRC, the motivation to change entrenched behaviours (such as inadequate physical activity and a diet that includes high levels of red and processed meats) may be lacking.

Patient and public involvement

We worked closely with the Pan Birmingham Cancer Network User Partnership Group who provided encouragement and confirmation that our paperwork was clear and appropriate.

Our PPI representative on the trial steering group attended all meetings and gave us valuable insights from the patient perspective. We included her between steering group meetings wherever possible.

We have not adopted any novel PPI techniques but strongly affirm the value of PPI in all research.

Data sharing statement

See link [https://www.nihr.ac.uk/documents/nihr-position-on-the-sharing-of-research-data/12253] for the NIHR position of the sharing of research data. The NIHR strongly supports the sharing of data in the most appropriate way, to help deliver research that maximises benefits to patients and the wider public, the health and care system and which contributes to economic growth in the UK. All requests for data should be directed to the award holder and managed by the award holder.

Disclaimer

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This project was carried out between January 2010 and June 2013. This final report has not been peer-reviewed. The report was examined by the Programme Director at the time of submission to assess completeness against the stated aims.