

A Service Evaluation of Patient Educational Bowel Preparation Videos- Improving the Quality of Bowel Preparation for Colonoscopy

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ABSTRACT

Objective: Effective bowel preparation is critical for efficient colonoscopy. We present evaluation of the impact educational bowel preparation videos had upon our service.

Methods: All patients undergoing colonoscopy with Moviprep were included over an eighteen-week period. Links and QR codes to online educational videos were sent to patients, along with written instructions for bowel prep prior to procedure.

Endoscopy nurses recorded whether patients had watched the videos on the day of procedure. Bowel cleanliness was graded by the Endoscopist using Boston bowel preparation (BBPS) and Aron chick scores.

Results: 1645 patients were included in total (51% male, average age 63). 11.8% (194) watched the educational videos (54% males, average age 59).

There was a statistically significant difference comparing video to non-video groups in those that had a good/excellent (85% v 79%; $p=0.047$) and excellent (33% v 24%, $p<0.01$) preparation compared with non-video group. The mean BBPS was higher in the video group overall (7.1 v 6.7; $p<0.01$) and for all colonic segments including the right colon ($p=0.02$).

There were no significant differences between the bowel preparation scores of those rated inadequate, poor, fair or good preparation. There was no significant difference for caecal intubation rate or polyp detection rate.

Discussion: In our evaluation, video education improved bowel preparation in all bowel segments but did not impact upon key performance indicators. Uptake of use of the online video resource was low. We believe use of complimentary online videos can improve bowel preparation quality which may improve colonoscopy service outcomes.

KEYWORDS

Colonoscopy, Colorectal cancer screening

BACKGROUND

Colonoscopy is the gold standard for the investigation and detection of bowel pathology including colorectal polyps and colorectal cancer [1]. The proportion of individuals aged 50 years or older who have undergone colonoscopy within the last 10 years is growing and currently ranges from 6%-25% in various European countries to 62% in the United States [1, 2]. For optimal visualization of colonic mucosal lesions bowel preparation must be sufficient [2]. However, bowel preparation is estimated to be inadequate in up to 12-25% of cases [3, 4].

Bowel preparation for colonoscopy is a complex undertaking, involving dietary modifications and laxative choice according to patient needs. An adequate level of cleansing is critical for the efficacy of colonoscopy. Key quality indicators of colonoscopy, such as caecal intubation rate and polyp detection rate, are associated with the quality of bowel cleansing [5-7]. An inadequate level of bowel cleansing also results in further costs through repeat examinations or alternative investigations [8]. Adverse consequences of ineffective bowel preparation include longer

procedural time and adverse events [4]. Several factors are known to contribute to poor bowel preparation, including patient co-morbidities [9, 10], medications [11] and factors related to pre-procedure diet and timing of administration [12, 13].

Poor patient compliance also results in suboptimal preparation. Several patient education tools are shown to improve understanding and adherence to bowel preparation instructions and bowel cleanliness [14]. Enhanced patient information and trained patient navigators [15], as well as telephone consultations [16], text messaging [17] and educational videos may improve the quality of bowel preparation [18-20]. The provision of both written and oral information with enhanced instructions for patients is consequently recommended in both the American and the most recent European bowel preparation guidelines. However, provision of verbal information with face to face or telephone consultation is difficult to resource for patients undergoing colonoscopy outside of the national bowel cancer screening programme.

We present data following the implementation of an educational bowel preparation video for our colonoscopy service in West Hertfordshire Hospitals NHS Trust.

METHODS

In collaboration with Health and Care Videos (OC407372) we scripted and prepared educational videos for our patients due to undergo a colonoscopy with information about their procedure and the dietary and bowel preparation procedures prior to a colonoscopy. These cover our existing written pre-procedure instructions. The link to the videos and QR code are included in patient written instructions and with an additional flyer advertising the link that is provided to the patients on booking their procedure. The link accesses the videos hosted on the trust endoscopy internet pages (Figure 1).

Bowel Preparation

All patients receive Moviprep unless undergoing a repeat procedure where this was previously not tolerated or inadequate. Instructions include a three-day low-residue diet and a split preparation for all procedures at or after 10am, taking the second dose 4 hours prior to the procedure time. Patients undergoing their procedure before 10am take both doses the evening before their procedure.

Patient Evaluation

All patients undergoing colonoscopy with Moviprep (standard instructions) in West Hertfordshire NHS Trust were included for evaluation over an eighteen-week period. Endoscopy nurses documented the preparation used and whether the patient had watched the videos in the endoscopy database. Bowel cleanliness was graded by the Endoscopist using validated bowel preparation scores (both the Boston Bowel prep score (BBPS) [21] and Aron chick scale [22]). All endoscopists had previously received education via a video regarding the Boston Bowel Prep Score (BBPS) in addition to the standard unit

use of Aron chick scale; as well as descriptors being present on the endoscopy reporting system as data is entered.

ANALYSIS

The endoscopy database was subsequently interrogated for the period (26/11/18 to 30/03/19). Chi squared test was used for categorical data and students t-tests for continuous variables where data was parametric and Mann-Whitney U test where non-parametric. Data was analyzed using Graph Pad Prism 5.

RESULTS

1654 Patients having Moviprep bowel preparation for colonoscopy were included for analysis. 195 patients reported they had viewed the educational video (11.8%). 51% were male with a median age of 63 (IQR 52-72). 58% of patients were ASA 1, 39% ASA 2 and 3% ASA 3. The overall caecal intubation rate was 96%, polyp detection rate was 40%. 46% of procedures were in the morning with 21% prior to 10am and consequently without a split preparation.

The median age of patients in the video group was lower (59 IQR 53-72) than in patients who did not watch the videos (63 IQR 53-72; $p < 0.001$). 54% of the video group and 51% of non-video group were male (ns). There was a higher proportion of ASA 1 patients in the video group (65%) than in the non-video group (57%; $p = 0.02$). There was no significant difference in the proportion of patients in the video group undergoing a morning or pre-10am procedure compared with patients in the non-video group (49% v 47% and 21.5% v 21% respectively; ns). There was a trend towards a higher proportion of patients undergoing a bowel cancer screening procedure in the non-video group compared with the video group, although this was not statistically significant (12.5% v 8%; $p = 0.08$) (Table 1).

All patients had bowel preparation graded with a documented Aron chick scale and 77% of patients also had a BBPS documented for all bowel segments (75% video v 77% non-video group). There was no significant difference in the proportion of patients with an inadequate or poor (video 1% v non-video 2%; ns); fair (video 14% v 19%; ns) or good bowel preparation (video 51% v non-video 55%; ns) between the groups. A greater proportion of patients in the video group had an Excellent/Good preparation compared with the non-video group (85% v 79%; $p = 0.047$) and a greater proportion of patients in the video group had an Excellent preparation compared with non-video group (33% v 24%, $p < 0.01$) (Figure 2). The mean BBPS score was higher in the video group (7.1 95% CI 6.9-7.4 v 6.7 95% CI 6.7-6.8; $p < 0.01$) (Figure 3) and the mean BBPS score was higher in the video group for all colonic segments including the right colon ($p = 0.02$).

There were no significant differences between the groups for other key performance indicators including caecal intubation rate (96.9% v 95.5%; ns) or polyp detection rate (40% v 40%; ns).

Due to the potential bias of a higher proportion of ASA 1 patients

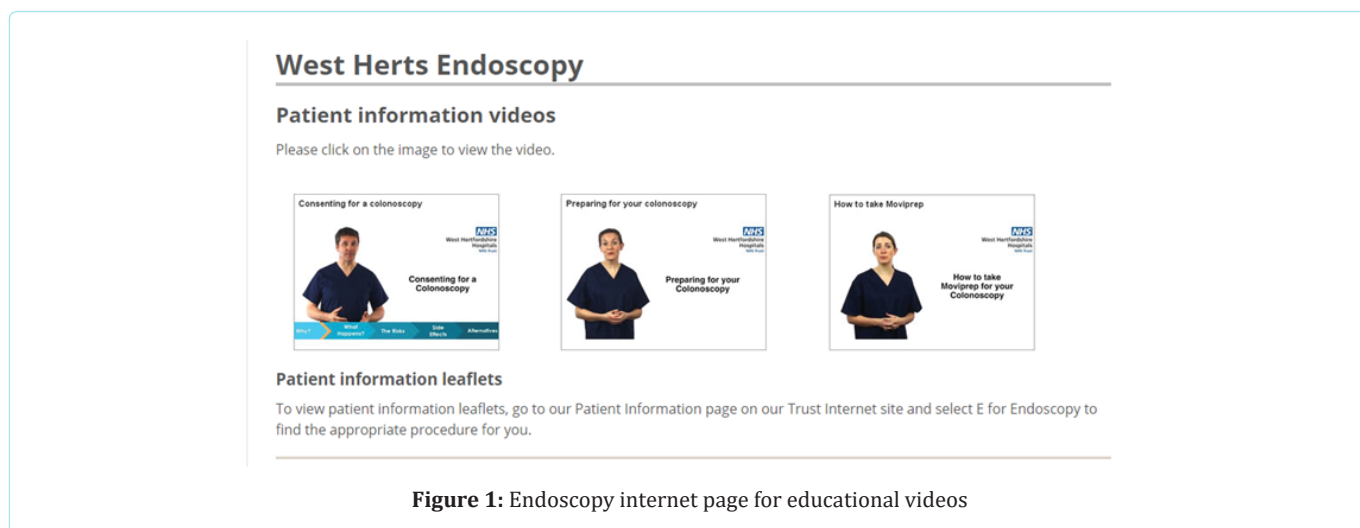


Figure 1: Endoscopy internet page for educational videos

Table 1: Patient Demographics

	Video Group (n=195)	Non-Video Group (n=1459)	
Median Age	59	63	p<0.01
Gender	54% male (105)	51% male (744)	
ASA Grade 1	65% (127)	57% (832)	P=0.03
Morning procedure	49% (96)	47% (686)	
Split dose preparation	78.5% (153)	79% (1153)	
Screening procedure	8% (16)	12.5% (182)	P=0.08

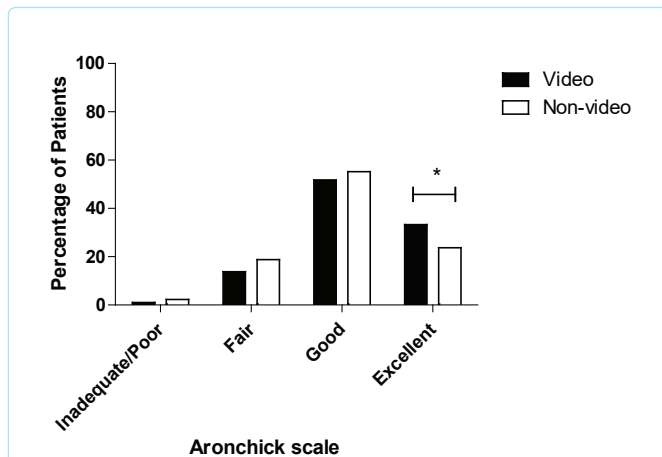


Figure 2: Aronchick scale scores for video and non-video groups. Percentage of patients in video and non-video groups for each criterion of the Aronchick scale. * denotes p values ≤ 0.05 .

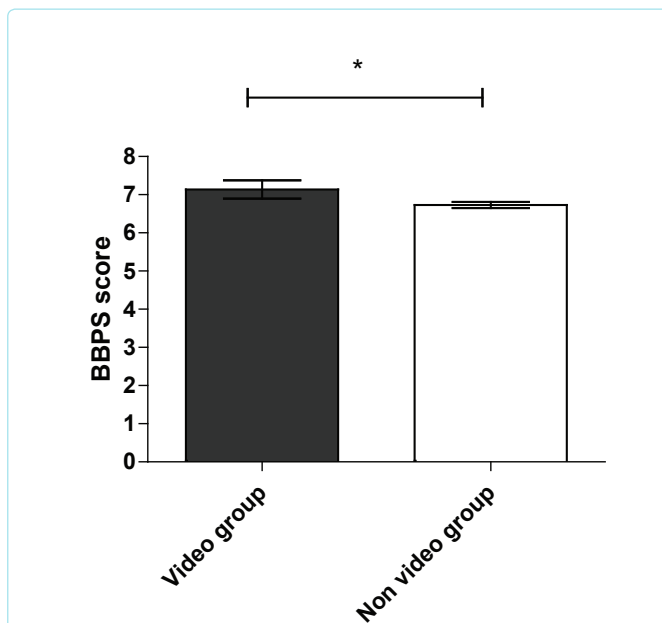


Figure 3: Mean BBPS for video and non-video groups. Mean BBPS for video and non-video groups. Error bars denote 95% confidence intervals. * denotes p values ≤ 0.05 .

in the video group we analyzed data excluding ASA 2 and 3 patients. Excluding ASA 2 and 3 patients there was no significant difference in the proportion of patients with a Good or Excellent preparation in the video group compared with the non-video group (87% v 83%; ns). However, there remained a difference in the proportion of patients with an Excellent preparation between the video and non-video groups (49% v 32%; p=0.01). The increase in the BBPS score (7.3 95% CI 7.0-7.6 v 6.9 95% CI 6.9-7.1; p=0.03) was also unchanged.

Patients undergoing a bowel cancer screening procedure underwent a face to face consultation regarding the procedure and preparation in addition to written instructions with a screening practitioner. Due to the potential bias with a trend toward a greater proportion of patients undergoing a bowel cancer screening colonoscopy in the non-video group we also analysed data excluding all patients undergoing a bowel cancer screening colonoscopy. There was an increase in the difference between the two groups with a good or excellent preparation (87% video group v 78% non-video group; p=0.005).

DISCUSSION

Effective bowel preparation is essential for the effectiveness of colonoscopy. Patient compliance is a critical determinant in bowel preparation quality. Several randomized studies have demonstrated improved cleanliness with enhanced instructions including the use of educational videos. This is an inexpensive way of delivering both written, visual and oral information to the patient before undergoing colonoscopy. We demonstrate that educational videos for bowel preparation can be used and are effective in improving bowel cleanliness prior to colonoscopy in a UK DGH service. In our evaluation, video education improved both the Aron chick and BBPS assessments of bowel preparation in all bowel segments.

As a service evaluation, patients were not randomized to receive video education or standard written instructions. Consequently, there are a number of limitations to our data. The uptake of patients watching the videos was low. Only 12% of patients watched the videos. There are a number of possible reasons for this. Firstly, the link to the videos web page was written both in the written preparation instructions and an additional flyer. It is likely that most people would not type in the link after writing the instructions and uptake may be higher if the link could be sent to an email or mobile phone directly opening the videos web page. We currently do not have the ability to text our patients, but intend to add the link in the future when we have the capacity to text patient reminders prior to their appointments. However, further research is necessary to understand other barriers to patient education and compliance with instructions prior to their procedure.

There are a number of other limitations to our analysis. We do not routinely record data on socio-economic background or educational level which may be relevant to such an analysis and to the differences between the groups. In addition, we do not electronically record data regarding specific co-morbidities or medications likely to affect the outcome of a bowel preparation. There were differences between the groups in the proportion of ASA 1 patients which may have biased towards improved preparation scores in the video group. However, analysis of ASA 1 patients only still demonstrated a greater proportion of patients with an 'excellent' preparation and higher mean BBPS score in the video group. Furthermore, it is likely that a trend to a higher proportion of patients undergoing a bowel cancer screening procedure where a face to face consultation with a screening practitioner is undertaken, may have biased towards better preparation in the non-video group. Excluding, bowel cancer screening patients did show an increase in the difference between the proportions of patients with a Good or Excellent bowel preparation between the video and non-video groups.

Despite improved preparation in the video group, there were no differences between the video and non-video groups in key performance indicators such as caecal intubation rate and polyp detection

rate. This is similar to previous studies of educational videos for bowel preparation and may be due to the small number of patients in the video group. It may also be due to the very low frequency of patients with inadequate preparations in both groups. We did not analyze procedure time. This may be a factor in the management of poorer colon preparation where significant time spent washing in order to acquire adequate mucosal views is required.

We demonstrate that there are challenges encouraging patients to engage with educational materials to enhance bowel preparation. However, we also demonstrate that online educational videos for bowel preparation do improve the bowel preparation quality. As such, we believe that the availability of online educational videos for bowel preparation are a valuable complimentary method of enhanced patient education prior to colonoscopy for our service.

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