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Does the Presence of an Endoscopy Nurse Influence Adenoma Detection Rate during Colonoscopy?

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Abstract

An endoscopy nurse acting as a second observer during colonoscopy may result in an increased adenoma detection rate (ADR). The impact a nurse can have on ADR may be related to endoscopy nurse experience. Common practice is to have an endoscopy nurse present in the procedure room during colonoscopy but not specifically dedicated to observation of the procedure. The objective of this study was to identify factors associated with increased rates of adenoma detection during colonoscopy. This was a retrospective study performed on 2001 adults who had colonoscopy in the year 2012 at a tertiary referral institution. Complete data were obtained for 1972 patients. Overall ADR was 21.9% among 17 endoscopists. Multivariate analysis of data was done to identify variables independently associated with ADR. Two nurses were independently associated with increased ADR, as were three endoscopists. Additional variables associated with increased ADR were male gender, patients of increasing age, patients with colorectal cancer (CRC) and a number of indications for procedure.

Keywords

Adenoma detection rate, Endoscopy nurse

Background

The ultimate goal of screening colonoscopy is to prevent, detect and treat colorectal cancers. Adenoma detection rate (ADR) has been recognized as a reliable quality indicator for screening colonoscopy [1]. There have been limited studies looking at whether the presence of an endoscopy nurse improves ADR. A study done on 844 patients in Korea by Lee et al. 2011 demonstrated that endoscopy nurse participation increased ADR, however, the benefit was exclusively with inexperienced endoscopists and nurses with ≥ 2 years endoscopy experience [2]. Another study done in Korea by Tae Sun Kim et al. 2012 showed no significant change in ADR during colonoscopy done by gastroenterology fellows, with or without an endoscopy nurse observing [3]. Additionally, in 2013, a randomized prospective study done at Yale University including 502 patients showed a trend toward improved overall ADR with endoscopy nurse observation during colonoscopy [4]. Nurses in this study by Aslanian et al. 2013 had ≥ 1.5 years of prior endoscopy experience.

We sought to identify if endoscopy nurses were independently associated with improved adenoma detection in our study. We also looked at a number of other variables independently associated with ADR. Variables previously identified as associated with increased ADR include advancing age, male gender, endoscopist, withdrawal time, higher quality bowel prep, etc [5-7].

Methods

This retrospective cohort study was performed on adults who underwent colonoscopy in the city of St. John's, Canada, in the year 2012. Subjects were identified through records from the health authority. Both the endoscopist and nursing procedure reports (which identified the endoscopy nurse charting the procedure) were extracted from the electronic medical record (EMR). Data were subsequently recorded on a standardized data sheet and entered into SPSS version 20.0 for analysis.

All nurses are educated at the Baccalaureate level and received some hands-on endoscopy nursing training by their peers. They had varying degrees of experience.

Quality of bowel preparation was not included in this study

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because it was not recorded in a standardized manner. The type of bowel preparation used varied among surgeons and consisted mainly of either a polyethylene glycol based preparation or a sodium picosulfate based preparation. Split-dose preparations were not used by any of the endoscopists during the study period.

Univariate analysis was used to identify variables associated with adenoma detection ($p < 0.10$) and multivariate logistic regression was used to identify variables independently associated with adenoma detection ($p < 0.05$). Student's T-test and analysis of variance were used for continuous variables and Chi-squared test for categorical variables.

An adenoma was defined as a lesion classified histologically as any of the following: adenoma, adenoma with carcinoma, sessile serrated adenoma/polyp, serrated adenoma, serrated adenoma with dysplasia or traditional serrated adenoma.

Results

In total, data were collected on 2001 colonoscopies and of these, 29 were excluded due to missing reports. Mean patient age was 59.4 years (± 11.6) with 1124 (57.0%) females. The most common indication for colonoscopy was family history of CRC in 510 (25.9%) patients. Mean withdrawal time was 11.8 minutes. A total of eight gastroenterologists and nine general surgeons were studied. Gastroenterologists performed 1293 colonoscopies (66%) and general surgeons performed 679 (34%). Nineteen endoscopy nurses with varying levels of experience were included in the study. Overall ADR was 21.9%.

In univariate analysis, mean age was higher in patients who had adenomas compared to those without (61.4 years vs. 57.4 years; $p < 0.001$). Adenomas were found more frequently in men than women (27.2% vs. 17.9%; $p < 0.001$) and in patients with histologically confirmed CRC (40.4% vs. 21.5%; $p = 0.002$).

ADR was associated with the procedure indication (Range: 4.9%-35.4%, $p < 0.001$) and the highest rates were seen in: personal history of polyps, abnormal colonic imaging and anemia/fecal occult blood positive (35.4%, 33.3% and 26.1%, respectively). Furthermore, ADR was associated with the nurse assisting (Range: 13.2%-50%; $p = 0.003$) and the endoscopist performing the procedure (Range: 10.5%-50.0%; $p < 0.001$).

In multivariate analysis, variables independently associated with ADR included the nurse assisting ($p = 0.021$), patient gender (OR = 1.79), patient age (OR = 1.03), histologically confirmed CRC (OR = 2.65), indication ($p < 0.001$), and endoscopist ($p = 0.002$) (Table 1). The beneficial effect of the two nurses (OR 4.4 and 3.4) had no association with a specific endoscopist. Indications most strongly associated included: abnormal colonic imaging, personal history of polyps and rectal bleed. Two nurses and three endoscopists had significantly higher ADRs when compared to the lowest detectors.

Discussion

Our study was designed to capture nursing factors as well as a number of other variables associated with ADR. Given our results, we see that just as some endoscopists can be associated with increased ADR, nurses can also be independently associated with higher ADRs.[6] This result bolsters the argument that the role of an endoscopy nurse should be expanded to look for polyps, especially in screening colonoscopy programs. We need to shift our focus to include both endoscopist and nursing factors when looking to improve ADR. Additional studies would be helpful to identify exactly what can be done to improve ADRs for individual nurses. This could make a significant improvement in overall patient care and outcome.

Table 1: Variables independently associated with increased ADR

Variable	Odds Ratio	p
Nurse 1	4.4	0.017
Nurse 2	3.4	0.027
Endoscopist 1	4.3	0.016
Endoscopist 2	3.4	0.033
Histologically confirmed CRC	2.7	0.005
Male gender	1.8	< 0.001
Age	1.03	< 0.001
Indication		
Abnormal colonic imaging	10.5	< 0.001
Personal history of polyps	9.8	< 0.001
Known carrier of a genetic CRC syndrome	8	0.01
Rectal bleeding	6.6	0.001

Note: ADR= adenoma detection rate; CRC= Colorectal cancer

The purpose of our study was not to identify specific reasons why some nurses are associated with higher ADR. However, an important factor may be experience in endoscopy setting as identified by Aslanian et al., and Lee et al., [2,4]. Nursing experience may not only improve polyp detection skills but also facilitate a nurse's comfort level bringing it to a physicians' attention. In this study, both nurses who were independently associated with higher ADRs had over eight years of endoscopy experience. All nurses are educated at the Baccalaureate level. Endoscopy nurses at our institution receive no formal training for polyp detection, as there are no written standards, nor are there any national standards with the Canadian Society of Gastroenterology Nurses and Associates at this time. However, at our institution, nurses are exposed early in their training to the different types of polyps and advised to voice any abnormalities they note to the endoscopist performing the procedure. They are also encouraged to turn their attention to the endoscope screen when they are not otherwise occupied with the patient. Junior nursing staff may be less confident in identifying lesions than senior nurses and standardized training in polyp detection, in addition to improving ADR, could help to correct this.

The study is limited by the generalizability of our population as we focused on only patients coming to two tertiary referral centers in St. John's Newfoundland. Also, a retrospective study design limits data collection to the information that has been previously documented in the records system. Specifically, we cannot evaluate exactly what the nurses associated with higher ADRs were doing differently.

Conclusion

Presence of an endoscopy nurse does influence adenoma detection rate. In this study we specifically identified that two endoscopy nurses were associated with higher ADRs. As we look to continually improve ADR in colonoscopy, focusing our attention and efforts to endoscopy nursing may be the next best step. Establishing early training standards for the endoscopy nurse may further improve ADR and overall quality of colonoscopy.

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