Overview of clinical, histopathological findings and assessment of adequacy of preparation for colonoscopy; King Hussein Medical Center experience

Talal Al shawabkeh M.D, Abdullah Abu Anzeh M.D**, Mohammad Lababdeh M.D**,Ruba Shannaq M.D***, Hussein Al hello M.D**, Hamzeh arabiat M.D**,Osama Nihad M.D***

* Department of gastroentology.
**Department of surgery.
***Department of histopathology.

ABSTRACT

Objective: The aim of this study was to show the clinical findings, histological findings and clinical outcomes of colonoscopy, as well as to evaluate the cecal intubation rate and the adequacy of preparation and sedation protocols.
Methods: This is a retrospective study that was conducted at the gastroenterology unit of the King Hussein Medical Center. The study included all individuals who underwent elective colonoscopy between August2017 and September 2018 for different indications. We collected and analysed data regarding demographics, indications, clinical findings, histological results, cecal intubation rate and reasons for the failure of cecal intubation, polyp detection rate, the distribution of polyps in the colon, methods for the removal of polyps and complications reported after colonoscopy.
Result: One thousand and twenty-five colonoscopies were included in this study within a period of 14 months. Overall, 620 colonoscopies were performed on males (60.48%), with a mean age of 53.78years (range 14-89 years). Three hundred and ninety-two (38.2%) colonoscopies were performed on individuals aged below 50 years. The most common indications for colonoscopy were post-colonic surgical follow-up and IBD follow-up (21.3%), while the least common indication was screening (8%). Failure of cecal intubation was reported in 95 colonoscopies (9.2%), thirty-eight cases (40%) due to poor preparation, and 57 (33%) due to an obstructing mass and intolerance of the procedure. Good colonic preparation was achieved in 683 cases (66.65%), while sub-optimal preparation was found in 29.6% and poor preparation in 3.7%. Abnormal colonoscopy was reported in 668 cases (65%); if haemorrhoids as the only finding in colonoscopy is excluded, the abnormality rate decreases to 47.5%. The most common abnormal findings were polyps (25.27%), IBD (6.7%), CRC (4.97%) and diverticulosis (5.3%). Abnormal results for those under the age of 50were seen in 42.6% of cases. Of these, polyps and cancer were reported in 13% of patients. The polyp detection rate was 25.27%, while the most common site was the rectosigmoid area (47.7%). Sixty three percent of polyps were removed by forceps. The most common histological findings in polyps were adenomas with low grade dysplasia (63.9%), adenomas with high grade dysplasia (7.2%), and hyperplastic polyps (24.3%), while4.5% of polyps were found to harbour cancer. Biopsies during the procedure were performed in 528 of colonoscopies (51.5%) and 27.6% were normal. There was no mortality due to the procedure.
Conclusion: We conclude that the bowel preparations and sedation protocols in use at the KHMC are adequate and comparable with the international standards. There is a need for increasing awareness of colonoscopy as the gold standard method for decreasing the mortality of colorectal cancer with virtually no complications.
Key Words: *colonoscopy, polyp, complications.*
***JRMS APRIL 2025*; 32 (1): 10.12816/0062160.**

INTRODUCTION

Colonoscopy is considered as a gold standard method for the screening of colorectal diseases such as colorectal cancer, inflammatory bowel disease and the detection of polyps. Colonoscopy for screening is recommended in people age 50 years and older in most guidelines.

[1]Colonoscopy was shown to reduce mortality from colorectal cancer.[2]Ninety percent of colonic tumours arise from adenomatous polyps, so the use of therapeutic colonoscopy with polypectomy leads to a significant decrease in mortality from colorectal cancer[3].Colonoscopy is considered complete when the scope reaches the iliocecal valve with recognition of the anatomical marks of the cecum. This depends on the experience of the colonoscopist, the quality of preparations, the adequacy of sedation and tolerance of the procedure by patients.[4]Indications for colonoscopy are numerous and vary from screening purposes, investigations for anemia, rectal bleeding, abdominal pain, constipation or diarrhoea, changes in bowel habits, decompression of the volvulus, and evaluations of findings in images such as CT and PET scans, as well as for follow-up and surveillance in patients with IBD or those who underwent colorectal surgeries for cancer or polypectomy.Screening is the process of looking for colorectal cancer in people who have no symptom. Screening methods can be divided into two main groups:stool-based tests or visual examination; however, if the patient chooses a test other than colonoscopy, any abnormal test result should be followed-up by colonoscopy.

METHODS

This is a retrospective study that was conducted at the gastroenterology unit at King Hussein Medical Center. All patients who underwent elective colonoscopy in the period from August 2017 to September 2018 for different indications were included in this study. The authors of the study collected and analysed data such as demographics, reasons for performing the procedure, clinical findings, histological results, cecal intubation, polyp detection rate and complications after colonoscopy.

The primary aim was to review the clinical and histological findings of colonoscopy, while the secondary outcome was to review the adequacy of bowel preparations used before the procedure and sedation used during the procedure to achieve complete colonoscopy.

Our protocol for bowel preparation includes five tablets of biscodyle 5 mg starting at 12.00 pm then 3 litres of sodium picosulphate followed by 5 tablets biscodyle 5 mg at 6.00 pm. Patients were educated regarding the importance of good hydration during and after starting the bowel preparation, in order to decrease the complications from dehydration, especially in the elderly and those with co morbid diseases.

Most of the studied cases were sedated using morphine and midazolam, starting with a dose of 2.5 mg and increasing to 7.5 mg according to patient tolerances. Ina few cases, colonoscopy was performed under general anaesthesia.

Patient demographics and clinical characteristics were displayed as means, standard deviations (SD)and percentages. The study was approved by the local ethics committee of the RMS.

RESULTS

One thousand and twenty-five colonoscopies were included in this study within a period of 14 months, with an average of seventy-four procedures per month. Overall, 620 colonoscopies were performed in males (60.48%), with a mean age of 53.78 years (range 14-89 years). The demographics and characteristics are shown in Table 1. The main indications for colonoscopies were followed-up for patients who underwent colorectal surgery for cancer or polypectomy and surveillance for patients who have IBD(21.3%), non-specific abdominal pain (17.7%), rectal bleeding (14.7%), anaemia (10.7%), constipation (10.7%), diarrhoea (4.88%) and changes in

bowel habits (1.49%).Screening colonoscopies were performed in eight percent of individuals, with 7.6% accounting for patients with abnormal findings on CT and PET scans. Patients with unintended weight loss accounted for 1.9%, while there were four cases of decompression of intestinal obstructions and the insertion of stents. The failure of cecal intubation was found in 95cases (9.2%),of which 38 cases(40%) were due to poor preparation, 26%due to an obstructing mass, and 7%because of intolerance to the procedure; also, 16.8% were due to anatomical problems like severe angulation or looping and 7% to avoid complications, as shown in Table 2.Good colonic preparations were achieved in 683 cases (66.65%), with sub-optimal preparations in 29.6%and poor preparations in 3.7%. Abnormal colonoscopy was reported in 668 cases (65%), which reduced to 47.5% cases with haemorrhoids as the only findings of colonoscopy were excluded. Haemorrhoids as the only findings in colonoscopy was reported in 179 patients, and haemorrhoids associated with other abnormalities were seen in 69 cases.

The most common abnormal findings were polyps (25.27%), IBD (6.7%), cancer (4.97%), diverticulosis (5.3%) and colitis (5.3%). Three hundred and ninety-two colonoscopies (38.2%) were performed for patients younger than 50 years.
Abnormal results were found in 42.6%of patients aged less than 50, as shown in Table 4.
Polyps and cancer were found in 13% of patients aged under 50 years, with IBD in 13.26%. Polyp characteristics are shown in Table 3. The polyp detection rate was 25.27%. The most common site was the recto-sigmoid area (47.7%). Sixty three percent of polyps were removed by forceps and the most common histological findings of polyps were adenoma with low grade dysplasia (63.9%), adenoma with high grade dysplasia (7.2%), and hyperplastic polyps (24.3%); overall, 4.5% of polyps were cancerous. The number of colonoscopies leading to biopsy was 528(51.5%), of which 27.6% showed normal mucosa in the histopathology reports. The morbidity rate was 0.78%, and there was no mortality.

Table I Demographic characteristics of patients

Criteria	Number of patients	Percentages
Gender		
Male	620	60.48%
Female	405	39.52%
Age		
Mean	53.78 year	
Range	14-89	
Median	55	
<50 years	392	38.25%
>50 years	633	61.75%

Table II.Causes of incompleteness of the colonoscopy

Completeness	Complete(90.74%; n = 930)	Incomplete(9.26%; n = 95)
Bowel preparations and sedation	Good(66.65%) Sub-optimal (29.6%) Tolerance of sedation protocol used (99.3%)	Poor preparations (38cases; 3.7 %) Obstructing mass(2.5%) Anatomical (1.56%) Intolerance (0.7%) Bleeding (0.7%)

Table III. Polyp characteristics

Polyp detection rate		25.27 %
Size Small <5mm Large >5mm	Small Large Variable size	68% 20% 12%
Method of removal	Forceps Hot snare Cold snare	63.7% 28.4% 7.55%
Distribution	Rectosigmoid Descending colon Transverse Right colon All colon	47.7% 10.9% 9.5% 21.9% 9.8%
Histopathology	LGD HGD Hyperplasic Cancer	63.9% 7.2% 24.3% 4.5%
	Single Multiple	44.8% 55.2%

Table IV The percentage of abnormality between ages above and below 50years

Colonoscopy result	Age of patient		Total	P- Value
	<50 years	>50 years		
Normal	225(57.4%)	313(49.4%)	538	>0.05
Abnormal	167(42.6%)	320(50.5%)	487	
Total	392	633	1025	

DISCUSSION:

The incidence of colorectal cancer (CRC) is increasing worldwide.[5] It is the leading cause of cancer-related deaths in Jordan and accounted for 2.2% of the total deaths in 2012.[6]To cope with such an increase, multiple strategies should be adopted by health care authorities, including the implementation of cancer screening programs. Recommendations for colorectal cancer screening vary between organisations. However, all agree that average risk adults should begin screening at age of 50 years, utilising one of several options for screening such as the faecal immunochemical test(FIT),annual faecal occult blood testing(FOBT) and periodic flexible sigmoidoscopy; if any test result is found to be abnormal, colonoscopy should follow. For example, the finding of a polyp larger than 1 cm in diameter during sigmoidoscopy is an indication for examination of the entire colon because 30-50% of these patients have additional polyps.[7]Chyke et al, in a large community-based study, concluded that screening colonoscopy was associated with a 67%reduction in the risk of death from any colorectal cancer.[8]

Our retrospective study showed that colonoscopy for screening purposes found only 8% and 34.9% of screened individuals to have abnormal findings; of them, 14.9% were found to have polyps or cancer. For patients under the age of 50, 42.6% in this study had abnormal findings, of which 13% had polyps or cancer ,and 13% also had IBD. Those findings highlight the need to reduce the age of screening colonoscopy to below 50 years.

This study included 1025 colonoscopies performed between August 2017 and September 2018 (14 months), with an average of 74 colonoscopies per month. Data from the study of Kong et al. showed the number of colonoscopies performed in three main hospitals to be 2502 colonoscopies in one year, with an average of 834 colonoscopies per hospital per year.[9]

There is a variety of drugs, preparations and methods used for bowel cleansing, with different results regarding the efficacy and rate of complications. In this study, using our standard of care for bowel preparation, we achieved good results in 96.25% of patients; however, 29.6% of colonoscopies were sub-

optimally prepared, but complete colonoscopy with cecal intubation could still be achieved. Suboptimal bowel preparation occurs in 25-30%of all colonoscopies, which not only attenuates the protective role of colonoscopy, but also increases the medical costs.[10]

Tan et al. compared the bowel preparation using sodium phosphate (Nap) and poly ethylene glycol (PEG) and concluded that preparations with Nap are more effective at achieving good preparations of the colon and have fewer adverse effects.[11]

Abut et al. also compared the effectiveness of bowel cleaning using large volumes of PEG with low volumes of PEG in combination with laxatives such as olive oil; they found that the lower volume plus laxative is significantly more adequate in cleaning the right colon than the large volume of PEG (97% vs. 74%), with greater patient satisfaction.[12]

The intolerance rate to colonoscopy in this study using our sedation protocol was seven percent of incomplete colonoscopies. The study by Brahmania et al. was performed to assess the causes of incomplete colonoscopy; they found that 16% of incomplete colonoscopies were due to inadequate sedation.[13]

In a few patients who were not fit for sedation or opted for no sedation, colonoscopies using the warm water method were performed by experts and showed good results; this method was associated with a significantly lower pain score and shorter recovery time.[14,15]

In our study, abnormal findings including haemorrhoids were found in about 65.1% of cases; comparing these results with those of the study by Farahenz jakar et al., abnormal results were also seen in 65%[1]. A previous study at KHMC ten years ago reported65 colonoscopies per month, with the main indication for colonoscopy being rectal bleeding (39%); in our study, the average number of colonoscopies was 74 per month and the main indications were surveillance and rectal bleeding.[16]

In our study, polyp removal was performed using forceps biopsy for small polyps less than 5 mm, while hot snare was used for pedinculated polyps and cold snare for flat polyps after elevation of the mucosa using the endoscopic mucosal resection (EMR)technique, which is safe for polyp removal.[17]

In our study, the polyp detection rate was25.7%, which is similar to that of other studies[9, 16];polyp detection rate is a surrogate marker for the quality of colonoscopy.

Regarding the complication rate, there was only one case of perforation in this study. There were no instances of bleeding that necessitated blood transfusion. Also, no mortality was reported during the period of the study, a result which is lower than the complication rate in many other studies.[18]

CONCLUSION

The bowel preparation drugs and sedation protocols used in our gastroenterology unit are adequate. We need to increase the rate of screening colonoscopy as it is considered a safe procedure and a gold standard method to decrease the mortality of colorectal cancer with a very low complication rate.

Limitation of the study

Since the endoscopy unit at KHMC is a teaching unit and a center for the training of young gastroenterologists, we expect that the quality of colonoscopy will be different depending on the level of experience.

REFERENCES:

1. Joukar F, Majd SK, Fani A, Nazari N, Mansour-Ghanaei F. Colonoscopy outcome in north of Iran (Guilan): 2006-2009. International journal of clinical and experimental medicine. 2012;5(4):321.

2. Anderloni A, Jovani M, Hassan C, Repici A. Advances, problems, and complications of polypectomy. Clinical and experimental gastroenterology. 2014;7:285
3. Vormbrock K, Mönkemüller K. Difficult colon polypectomy. World journal of gastrointestinal endoscopy. 2012 Jul 16;4(7):269
4.Geraci G, Pisello F, Modica G, Li FV, Facella T, Romeo G, *et al*. Bowel preparation before colonoscopy: personal experience and brief literature review. Il Giornale di chirurgia. 2007 May;28(5):227-31.
5.Arnold M, Sierra MS, Laversanne M, Soerjomataram I, Jemal A, Bray F. Global patterns and trends in colorectal cancer incidence and mortality. Gut 2017 Apr;66(4):683-691. doi: 10.1136/gutjnl-2015-310912. Epub 2016 Jan 27.
6.JordanWHO statistical profile, WHO. 2015. Available from: http://www.who.int/gho/countries/jor.pdf.
7.David E Stein.colonoscopy. Medscape 2019 Jun 7.avaliable from: https://emedicine.medscape.com/article/1819350-overview
8.Doubeni CA, Corley DA, Quinn VP, Jensen CD, Zauber AG,et al. Effectiveness of screening colonoscopy in reducing the risk of death from right and left colon cancer: a large community-based study. Gut. 2018 Feb 1;67(2):291-8.
9.Kong C, Young AN, Benson K, Keating JJ, Davies AH. OC-048 Colonoscopy: What is the Number Required to Maintain Competency?-a Retrospective Audit. Gut. 2013 Jun 1;62:A21.
10.Chang JY, Moon CM, Lee HJ, Yang HJ, Jung Y, et al. Predictive factors for missed adenoma on repeat colonoscopy in patients with suboptimal bowel preparation on initial colonoscopy: A KASID multicenter study. PloS one. 2018 Apr 26;13(4):e0195709.
11.Tan JJ, Tjandra JJ. Which is the optimal bowel preparation for colonoscopy–a meta-analysis.Colorectal Disease. 2006 May;8(4):247-5810Siao-Salera R, Leung JW, Mann SK, Canete W, Gutierrez R, Galzote CR, Leung FW. Options of sedation or no sedation for colonoscopy-the perspective of the GI nurses and technicians.Journal of interventional gastroenterology. 2011 Jan;1(1):37.
12.Abut E, Guveli H, Yasar B, Bolukbas C,et al. Administration of olive oil followed by a low volume of polyethylene glycol-electrolyte lavage solution improves patient satisfaction with right-side colonic cleansing over administration of the conventional volume of polyethylene glycol-electrolyte lavage solution for colonoscopy preparation. Gastrointestinal endoscopy. 2009 Sep 1;70(3):515-21
13.Brahmania M, Park J, Svarta S, Tong J, Kwok R, Enns R. Incomplete colonoscopy: maximizing completion rates of gastroenterologists. Canadian Journal of Gastroenterology and Hepatology. 2012;26(9):589-92.
14.Leung FW. Is there a place for sedationless colonoscopy?.Journal of interventional gastroenterology. 2011 Jan;1(1):19.
15.Siao-Salera R, Leung JW, Mann SK, Canete W, Gutierrez R, Galzote CR, et al. Options of sedation or no sedation for colonoscopy-the perspective of the GI nurses and technicians. Journal of interventional gastroenterology. 2011 Jan;1(1):37.
16.Ghazzawi I, Ajlouni Y, Smadi B, Nassan W, Mryyiat Z, TalafeehA,et al. Colonoscopy at King Hussein Medical Center; indications, effectiveness, safety and outcome. Jord Roy Med Serv. 2010;17:15-20.
17.Qu J, Jian H, Li L, Zhang Y, Feng B, Li Z, Zuo X. Effectiveness and safety of cold versus hot snare polypectomy: A meta-analysis. Journal of gastroenterology and hepatology. 2019 Jan;34(1):49-58.
18.Ko CW. Colonoscopy Risks: What Is Known and What Are the Next Steps?. Gastroenterology. 2018 Feb 1;154(3):473-5.