COLONOSCOPY AT KING HUSSEIN MEDICAL CENTER; INDICATIONS, EFFECTIVENESS, SAFETY AND OUTCOME

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ABSTRACT

Objective: To find out the indications, effectiveness, safety and outcome of colonoscopy at King Hussein Medical Center.

Methods: A retrospective analysis of the colonoscopy records for patients who underwent elective colonoscopy over a 7-year period (January 2000-October 2006) at King Hussein Medical Center in Amman, Jordan was done. Data collected included the number of the patients, age, gender, reason for doing the procedure, endoscopic findings, and any immediate complication. For all patients colonic preparation using Dulcolax (Biscodyl 5 mg tab) and Fortrans (Macrogol 4000-64 gm) or castor oil with normal saline and uni-stiffness endoscopes were used. Almost all colonoscopies were done with sedation using Mipiridine 25 mg and Midazolam 3 mg intravenously.

Results: A total of 3865 colonoscopies were included in the study, 42% percent of patients were aged less than 50 years. 89% of the colonoscopies were done for patients referred from physicians as outpatients and 11% for patients who were already in hospital. The number of endoscopies performed during the year 2006 per month was considerably higher (mean 65) than that done during the year 2000 (mean 30). The main indications for colonoscopies were rectal bleeding (39%), constipation (17%), and diarrhea in 12%. In 3749 (97%) patients, the procedure was completed up to cecum. Normal colonoscopy was reported in 72.5% of patients. The most common abnormal findings were colonic cancer (29%), colonic polyps in 24% and inflammatory bowel disease in 16%. Other common findings were diverticulosis (13.4%), melanosis coli (2.4%), and vascular ectasias in 2.5%. Internal hemorrhoids was a coexistent finding in (n=30) those diagnosed as colonic cancer and (n=18) in those diagnosed as colonic polyps, but it was the only colonoscopic finding in 130 patients (12.2%). Colonic polyps were also found as coexistent finding in 47 patients diagnosed as colonic cancer. Seven (0.018%) patients had a major complication related to the procedure in the form of colonic perforation (n=4), minor bleeding which did not necessitate blood transfusion (n=2), and stuck snare wire due to looping around a normal colonic mucosa that mandated removal by lapratomy (n=1).

Conclusions: Colonoscopy at King Hussein Medical Center; is safe and effective in establishing a definitive diagnosis, and rarely associated with major complications such as perforation or bleeding.

Keywords: Colonoscopy, King Hussein Medical Center, Safety, Outcome.

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Introduction

Gastrointestinal disorders are extremely common in the general population.[1,2] Which group of patients should be investigated and when, remains controversial. Accurate evaluation of symptoms is important because of the implications for investigation, management and morbidity, although it is often difficult to reach an accurate diagnosis on clinical grounds alone.[3] The diagnosis of colonic diseases by classical symptoms is often incorrect.[4] Physical examination and routine hematological and biochemical investigations are also usually unhelpful.[5] At this point, the clinician needs to decide whether a further investigation is necessary. The patients' perception of their presenting symptoms also plays a significant role in the management strategy. Patients may or may not be bothered by their presenting symptoms.[6] Instead, psychosocial factors, including fear of serious disease, may be the important factor for their attendance to a doctor.[7] Colonoscopy is the investigation of choice for screening individuals at risk for early cancerous or premalignant lesions, thereby helping to minimize the impact of cancer on communities.[8]

Colonoscopy was introduced in the 1960's and it became a very useful method in the diagnosis and therapy of colonic diseases.[9,10] Colonoscopy is very helpful in investigating gastrointestinal bleeding, unexplained changes in bowel habit or suspicion of colon cancer. A colonoscopy is often used to help in diagnosing inflammatory bowel disease. In older patients an unexplained drop in haemoglobin (a sign of anemia) is an indication to do a colonoscopy as this may be due to colon cancer.

We studied colonoscopies done in our gastroenterology unit at King Hussein Medical Center to determine the indications for colonoscopies, the spectrum of endoscopic findings, and any reported complication. This is the first report on this service in Jordan.

Methods

A retrospective evaluation of the lower endoscopy service at King Hussein Medical Center was conducted. The records for all patients aged 16 years or more who underwent colonoscopy between January 2000 and October 2006 were reviewed. Repeated colonoscopies were excluded. Data collected included the number of the patients, age, gander, indication, endoscopic findings, and any complication reported.

Colonic preparation before all lower gastrointestinal examinations called for the administration of the following: 1-Biscodyl 5mg tab (Dulcolax) and Macrogel 4000-64 gm (Fortrans) or 2- caster oil and normal saline.

The endoscopy room set up, the instruments, and the number of nursing staff were the same for all the patients. There were two or three endoscopists for each list of colonoscopies. One of the experienced endoscopists who had performed at least 500 colonoscopic procedures, observed or completed the patients' procedures. Uni-stiffness endoscopes were used (CF-240AI/AL or CF-260AI; Olympus Optical, Tokyo, Japan, or Pentax EC 3840L).

The patients were evaluated well before, and during the procedure in order for the endoscopist to be ready for dealing with any complications. Conscious sedation with intravenous Midazolam (Dormicum) and Mipiridine 25 mg were provided at the patients' request. Otherwise, they did not receive analgesia. Conscious sedation was administered via routine, continuous venous access. Intravenous Hyoscine butylbromide (Buscopan) was used as an antispasmodic agent if the patient had no contraindications (e.g. prostatic hyperplasia requiring therapy, narrow-angle glaucoma, and tachyarrhythmia) when needed. The examination was considered complete when the cecum was reached. Entering the terminal ileum is not needed in all the procedures, unless indicated in cases of chronic diarrhea, suspicion of terminal ileum lesions, or for training purposes.

We arbitrarily subdivided the service into seven periods, each one of one year, to compare the workload in form of the number of colonoscopies done per month and yearly.

Results

Between January 2000 and October 2006, 3,865 colonoscopies were performed on patients aged 16 years and above. The mean age of patients was 51.5 years (range 16-86), 42% of patients were aged less than 50, women had 1,159 (30%) and men 2,706 (70%) examinations. The vast majority of the patients were healthy, 154 (4%) of patients had one or more chronic diseases, for example, 51 patients had ischemic heart disease. A total of 3440 (89%) endoscopies were done for patients referred from

Table I. Indications

	Number (*n* = 3865)	%
Rectal bleeding	1507	39
Constipation	657	17
Diarrhea	464	12
Abdominal pain	348	9
Alternation in bowel habit	232	6
Family history of colonic cancer	155	4
Iron deficiency anemia	106	3
Abdominal distension	108	2.7
Melena with normal upper endoscopy	104	2.6
Weight loss	73	1.8
Metastasis cancer; searching for the primary	54	1.4
Post intestinal obstruction	35	0.9
Abdominal mass by CT scan	22	0.6

Table II. Colonoscopic findings

Finding	Number (*n* = 3865)	%
Normal Endoscopy	***2802***	***72.5***
Abnormal Endoscopic findings	***1063***	***27.5***
Colonic cancer	308	29
Colonic polyps	250	23.5
Inflammatory bowel disease	162	15.2
Diverticulosis	142	13.4
Internal hemorrhoids	130	12.2
Melanosis coli	31	2.9
Vascular ectasias	27	2.5
Familial adenomatous polyposis	8	0.8
Behcet ulcer	3	0.3
Pneumocystoides intestinalis	2	0.2

Table III. Number of colonoscopies during the period of study

Year	Number of patients	Mean number per month	%
2000	360	30	9
2001	487	40	12
2002	511	42.6	12.7
2003	505	42	12.6
2004	664	55.3	17
2005	687	57.2	17.1
2006(10months)	651	65	19.6
Total	3865	332.1	

Table IV. Complications reported during the period of the study

Complications	Number (*n* = 3865)	%
Abdominal distension	464	12
Abdominal pain	278	7.2
Sedation overdose	8	0.21
Perforation	4	0.1
Minor rectal bleeding	2	0.05
Stuck snare wire around normal colonic mucosa	1	0.026

gastroenterology clinic as outpatients and 425 (11%) for patients who were already in hospital. The main indications for colonoscopies were rectal bleeding (39%), constipation (17%), and diarrhea in 12% of the cases. The other indications were abdominal pain (9%), alternation in bowel habit (6%), family history of colonic cancer (4%, iron deficiency anemia (3%), melena with normal upper endoscopy (2.6%), abdominal distention (2.7%), weight loss (1.8%), searching for a primary of metastasis cancer (1.4%), post intestinal obstruction searching for underlying cause (0.9%) and abdominal mass by CT scan in 0.6%, as shown in Table I. The procedure was completed up to caecum in 3,749 (97%) patients, 72.5% of endoscopies (n=2,802) performed had normal findings, and the rest (n=1,063, 27.5%) had abnormal endoscopic findings.

The most common abnormal finding over all was colonic cancer in 308 (29%) patients. Other common findings according to frequency were colonic polyps in 250 (23.5%), inflammatory bowel disease in 163 (15.2%), diverticulosis in 142 (13.4%), hemorrhoids 130 (12.2%), melanosis coli in 31 (2.9%), vascular ectasias in 27 (2.5%), familial adenomatosis polyposis in eight (0.8%), Behcet ulcer in three (0.3%) and pneumocystoides intestinalis in two (0.2%) patients as shown in Table II. Within these seven years of the study, there were 308 cases of carcinoma diagnosed.

The number of endoscopies performed during the time period 2006 was considerably increased (n=651, 19.6% in 10 months) in comparison with that done during the 2000 period (n=360, 9% in 12 months) (see Table III). The number of colonoscopies was increasing every year starting from 2000. There were no significant differences between the seven period groups in the indications for the colonoscopies, spectrum of abnormal

Table V. Patients' characteristics and colonoscopic performance parameters

Characteristics	Patients (n = 3,865)	%
Age		
Mean age (years)	52.1	
Age range	16–86	
Age less than 50 years	1623	42
Gender		
Men	2706	70
Women	1159	30
Referral from		
Gastroenterology clinic (Outpatients)	3440	89
Medical or surgical ward (Inpatients)	425	11
Sedation		
Conscious sedation (Midazolam 3mg & pethidine 25mg IV)	3802	98
No sedation	63	2
Biopsies and treatment		
Biopsy performed	1318	34
Polypectomy performed	250	6
Limit of colonoscopy		
Incomplete colonoscopy (inability to reach caecum)	116	3
Complete colonoscopy (up to caecum)	3749	97
Complete colonoscopy with ileoscopy (up to terminal ileum)	1623	42

findings, or the rate of cancer detection. Seven (0.018%) of the patients had a major complication related to the procedure in the form of perforation (n=4), minor bleeding not necessitating blood transfusion (n=2), and stuck snare wire due to looping around a normal colonic mucosa that mandated removal by laparotomy (n=1). Minor complications according to frequency were abdominal distension (n=464, 12%), abdominal pain (n=278, 7.2%), and sedation overdose (n=8, 0.21%) which treated by the specific antidote without necessitating hospital admission (see Table IV).

Discussion

Endoscopy unit at King Hussein Medical Center was established in 1980. King Hussein Medical Center is a teaching hospital, receives referrals from all medical sectors in different parts in Jordan. It mainly serves the military personnel and their dependents. This may explain why our patient sample was relatively young with 42% being less than 50 years old (see Table V). At the same time most (70%) patients were men, which may also reflect our culture where most women are modest and therefore when offered colonoscopy try to avoid doing the procedure.

Colonoscopy is a widely used diagnostic and therapeutic intervention. The procedure is usually well tolerated, with less than 0.5% of patients developing bowel perforation. Perforation usually manifests soon after the procedure with generalized abdominal pain. In our study colonoscopy was safe and well tolerated. There were seven major complications related to the procedure, two patients presented in the same day of colonoscopy to the emergency department with minor rectal bleeding and they were hemodynamicaly stable without drop in hemoglobin, which did not mandate blood transfusion. Four patients had colonic perforation; two of them had normal colonoscopy, one occurred while trying to bypass a tumor in the descending colon, and one post polypectomy in the ascending colon. All four patients were referred to surgery and underwent laparotomy and suturing of the perforation site and the patient with the tumor additionally had right hemicolectomy. In one patient, while trying to remove a transverse colon polyp, the snare stuck around normal mucosa, and the endoscopist was unable to take it out with different maneuvers. The patient was sent to the theatre with the scope and the snare inside where he had laparotomy for removal of stuck snare.

Minor complications were noticed in about 20% of the patients in the form of abdominal pain, distension, sedation and overdose. No treatment apart from giving an antidote and reassurance was provided for these minor complications. Patients left the endoscopy unit in a very good condition and were mostly asymptomatic.

Although colonoscopy has been performed for decades, reducing patient discomfort and improving their satisfaction remains difficult.[11] Around 4% of patients take unplanned leave from work on the day after colonoscopy. Attention has been focused on improving the comfort and safety of the procedure to promote compliance with recommended screening.[12] Residual bowel gas is a key contributor to abdominal pain after colonoscopy, and several methods have been tried to eliminate insufflated gas. Abdominal distension is not usually dangerous, but it is time-consuming for medical personnel to follow up and explain.[13,14]

According to a consensus statement of the American Society of Gastrointestinal Endoscopy (ASGE) revised in 2000, colonoscopy is generally indicated for the surveillance of colonic neoplasia and evaluation of unexplained anemia, rectal bleeding, and identification of abnormalities on barium enema, chronic diarrhea and inflammatory bowel diseases.[15] In some reports, abdominal symptoms such as pain or abnormal bowel habits were reported as an indication for colonoscopy.[16,17]

In our study the main indications for colonoscopies were rectal bleeding (39%), constipation (17%), and diarrhea (12%). Screening colonoscopy still not widely recommended in Jordan, especially in patients followed up in public hospitals.

Colonoscopy is generally performed with intravenous sedation and analgesia because it can sometimes be a painful procedure. Many different sedative and analgesic agents such as Nitrous oxide, diazepam, midazolam, hyoscine butylbromide, meperidine and midazolam, propofol, midazolam and propofol have been used for successful colonoscopy and patient comfort.[18]

In the present study we used meperidine 25mg and midazolam 2mg intravenously, which can be repeated in the same doses according to patient's tolerance. This may be more safe, but patients will have repeated discomfort because they are conscious and feel the distension or looping pain during manipulation of the scope.

Normal examination was a frequent finding in 72.5% of scoped patients. This is one of the usual characteristics of endoscopy services, where the negative results are as of value as the positive ones, and provide relief to the patient and his physician.[19] At the same time it may reflect a weak indications or low threshold for referring for colonoscopy to relieve patients stress.

Colonic cancer (29%) and colonic polyps (23.5 %) were the most common abnormal findings all over the duration of the study period. Inflammatory bowel disease (15.2%) was the third frequent finding as in other studies.[20] This may be explained by our patients' sample, as most of the colonoscopies were done to rule out cancer or inflammatory bowel disease. We do not know whether this is the actual prevalence of colonic polyps in our locality, or that we were under diagnosing this abnormality because of missing polyps in our procedures. This may need further investigations and comparative prospective studies. Diverticulosis was found in 13.4% of our patients, which is lower than that found in Western countries.[21] This may be related to our sample which was relatively young, or may reflect the life style in our locality in eating high fiber food, which is protective against diverticulosis.[22]

About 16% of patients diagnosed with cancer have no alarming symptom, and may be missed due to inaccurate history taking. Early detection of cancer, which may reflect low indication threshold for doing the colonoscopy, provides better prognosis for the patients.

Rectal bleeding in our patients was a frequent complaint, most of them were younger than 50 and referred from surgeons to check for colonic pathology, but in about three quarters, the endoscopy showed hemorrhoids or normal findings. This means that rectal bleeding was a poor predictor for the endoscopic findings (25%) of patients, and may be explained by misunderstanding what the patient has meant by rectal bleeding, poor clinical evaluation by the surgeon, exaggeration from the patient himself, or healed or missed lesion at the time of endoscopy.

It is traditionally believed that a specialist consultation can select suitable patients for colonoscopy and so a better diagnostic yield. However, it is generally agreed nowadays that attempts to justify doing the procedure by assessing the diagnostic yield are not appropriate. A negative endoscopic finding is as important as a positive one in the management strategy of lower gastrointestinal symptoms.[13,16,17,23]

In evaluation of workload in the form of the numbers of colonoscopies performed, it is clearly noticed that the workload has considerably increased throughout the years starting from 2000 with 30 colonoscopies per month till 2006 with 65 colonoscopies per month. This may indicate that

colonoscopy services became more popular and more acceptable culturally because of more patient education and feedback. Our endoscopy unit was established with two endoscopists in 1987, this number increase to four during the years 1994-2003 and reached seven endoscopists from 2004 till now.

Conclusion

Indications for colonoscopy should not be too strict. Colonoscopy should be regarded as a useful, safe, and effective examination in patients who have gastrointestinal complaints. A rapid and definitive diagnosis can be made. We believe that a negative endoscopic result is as valuable as a positive one, because it provides relief to the patient and his treating physician.

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