Original Article

Usefulness of early colonoscopy in the diagnosis and treatment of moderate or severe lower gastrointestinal bleeding

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ABSTRACT

A total of 38,686 colonoscopies were performed between January 1985 and December 2012 at Hospital Sírio-Libanês, in São Paulo, Brazil. Two hundred thirty-four patients (0.6%) had acute lower gastrointestinal bleeding of moderate or severe intensity. A definitive diagnosis was possible in 151 cases, 64.5% of these patients.

This study was approved by the Institutional Review Board. Medical charts were reviewed. All examinations were done under sedation by the same medical team.

The predominant sources of bleeding were colonic diverticula (73 patients; 31%), ischemic or infectious colitis (18 patients; 7.7%) and radiation proctitis (18 patients; 7.7%).

A specific therapeutic intervention was performed on 61 of the 151 patients who had the diagnosis confirmed (40.4%), according to the source of bleeding. Most patients with post-polypectomy bleeding were treated with injection of epinephrine (40%) and clipping (40%). Patients with angiodysplasia were treated predominantly with argon plasma coagulation (42%).

Injection of epinephrine was the most frequent treatment, regardless of the source of bleeding (34.4%), followed by argon plasma coagulation (31.1%).

Control of active hemorrhage was achieved endoscopically in 98.8% of the patients.

Our data shows that early colonoscopy in the management of patients with suspected acute lower gastrointestinal bleeding is a useful tool for diagnosis and treatment.

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Utilidade da colonoscopia precoce no diagnóstico e tratamento do sangramento gastrointestinal baixo moderado ou grave

R E S U M O

Palavras-chave:
Sangramento gastrointestinal baixo
Colonoscopia
Tratamento endoscópico
Preparação intestinal

No total, 38.686 colonoscopias foram realizadas entre janeiro de 1985 e dezembro de 2012 no Hospital Sírio-Libanês, em São Paulo, Brasil. 234 pacientes (0,6%) sofriam de sangramento gastrointestinal baixo agudo (SGIBA) de intensidade moderada ou grave. Em 151 casos (64,5% desses pacientes) foi possível estabelecer um diagnóstico definitivo.

O estudo foi aprovado pelo Comitê de Revisão Institucional. Os prontuários clínicos foram revisados.

Todos os exames foram realizados com o paciente sedado e pela mesma equipe clínica.

As origens predominantes de sangramento foram divertículos colônicos (73 pacientes; 31%), colite isquêmica ou infecciosa (18 pacientes; 7,7%) e proctite por radiação (18 pacientes; 7,7%).

Uma intervenção terapêutica específica foi realizada em 61 dos 151 pacientes com diagnóstico confirmado (40,4%), de acordo com a origem do sangramento. Em sua maioria, os pacientes com sangramento pós-polipectomia foram tratados com injeção de adrenalina (40%) e por *clipping* (40%). Os pacientes com angiodisplasia foram tratados predominantemente com coagulação com plasma de argônio (42%).

O tratamento mais frequentemente administrado foi a injeção de adrenalina, independentemente da origem do sangramento (34,4%), seguida pela coagulação com plasma de argônio (31,1%).

O controle da hemorragia ativa foi obtido por via endoscópica em 98,8% dos pacientes. Nossos dados revelam que o uso precoce da colonoscopia no tratamento de pacientes com suspeita de SGIBA é instrumento útil para o diagnóstico e tratamento.

Introduction

Acute lower gastrointestinal bleeding (ALGIB) is still a diagnostic and therapeutic challenge. In clinical practice, ALGIB can be defined as any gastrointestinal bleeding of recent onset (within the last 12–24 h) originating beyond the ileocecal valve. This bleeding may lead to systemic manifestations, such as hemodynamic instability, anemia, and the need for blood transfusion.[1] Patients with ALGIB present with rectal bleeding or melena, depending on the volume of bleeding and the speed of colonic transit. In some patients, there may be abdominal pain and hemodynamic instability. Anemia characterizes more severe cases. There are some data from clinical history that may suggest the cause of bleeding. For example, the use of aspirin or non-steroidal anti-inflammatory drugs is often associated with ALGIB, due mainly to diverticular disease, as well as with upper gastrointestinal bleeding (UGIB). Patients with acute colonic ischemia usually present rapid onset of mild abdominal pain and tenderness over the affected bowel, most often involving the left side. Mild to moderate amounts of rectal bleeding or bloody diarrhea usually develop within 24 h of the onset of abdominal pain. In patients with a history of prostate cancer or cervical cancer, it may be related to actinic proctitis, even if irradiation preceded the bleeding by many years. A history of recent polypectomy should guide the investigation of ALGIB toward the point of resection.[2]

The clinical consequences of ALGIB are variable and dependent upon the intensity of the bleeding and on patient baseline clinical conditions. About half of patients present anemia and hemodynamic compromise; however, these changes are less evident in patients with ALGIB than in those with UGIB.[3] Studies describe clinical predictors of ALGIB severity: heart rate >100 beats/min, systolic blood pressure <100 mmHg, active rectal bleeding during the first 4 h of observation, and initial hematocrit <35%.[4,5]

The incidence of ALGIB is estimated at 20 cases per 100,000 adults, which represents one quarter to one third of patients hospitalized for gastrointestinal bleeding.[6] However, ALGIB more commonly affects the elderly, with an incidence as high as 200 per 100,000 of those in their ninth decade of life. The case-fatality rate for patients with ALGIB is 3.6% and patients with active bleeding during hospitalization have a higher risk of death.[7]

Bleeding tends to be self-limited and to stop spontaneously in about 80% of cases.[8] Once the bleeding stops spontaneously, elective colonoscopy is indicated. In those patients who keep bleeding, the diagnosis should be done regardless of the hemorrhage. Although colonoscopy has been considered impracticable due to the frequent impossibility of colon cleaning, more recent data show that this procedure is feasible and allows for diagnosis in most cases.[9] Colonoscopy has repeatedly been shown to be safe, effective, and useful, especially when done in the first 12–24 h after admission.[10] Colonoscopy generally has complication rates below 3% and high

diagnostic utility in identifying the source of ALGIB.[10–12] The optimal timing for endoscopic examination has not been determined. However, recent data demonstrates that colonoscopy performed within the first 24 h from admission may result in a definitive diagnosis in up to 96% of patients.[13] The accuracy of colonoscopy in investigating cases of ALGIB varies from 72% to 86%, and cecal intubation is achieved in 95% of the cases.[8,14]

Early reports of successful hemostasis in patients with diverticular disease and non-bleeding visible vessels encouraged more frequent use of this modality to treat ALGIB.[15] A prospective study was conducted by Jensen et al. with 10 patients with severe ALGIB who were treated with endoscopic maneuvers. They found that endoscopic hemostasis was achieved in all 10 patients, with no episodes of early re-bleeding. At 30 months of follow-up, none of the patients had late bleeding.[16] A recent review of all published series found a low complication rate, as well as a low recurrence rate (<10%) in patients treated with endoscopic methods.[17]

In the course of a study on the prevalence of ALGIB in our practice, we have also assessed the role of early colonoscopy as the primary method of evaluation and treatment in these patients.

Patients and methods

Patients were eligible for inclusion if they presented with hematochezia (red or maroon rectal output) and had one of the following high-risk features: heart rate >100 beats/min, systolic blood pressure <100 mmHg, need of blood transfusion or drop in hemoglobin >1.5 g/dl within a 6 h period, according to information from the medical records.

A total of 38,686 colonoscopies were performed at our practice during the period examined by this study. Two hundred thirty-four patients (0.6%) had ALGIB of moderate or severe intensity. Among these 234 patients, a definitive diagnosis was possible in 151 cases, 64.5% of these patients.

All colonoscopies were performed between January 1985 and December 2012 in the endoscopy unit of Hospital Sírio-Libanês, in São Paulo, Brazil. We defined patients with ALGIB of moderate or severe intensity as those having lower gastrointestinal bleeding of recent onset (<6 h). Our analysis reviewed the medical charts and colonoscopy results of these patients retrospectively. All patients were treated within the context of routine care. Resuscitation was to be performed on all patients with instability (shock, orthostatic hypotension) or evidence of severe bleeding or active bleeding and these patients were then to be admitted to the intensive care unit. Volume expansion required two peripheral venous access caliber or central venous access. Patients with heart failure or valvular heart disease may have benefited from monitoring of pulmonary artery pressure with a Swan-Ganz catheter, minimizing the risk of over-hydration. Upper endoscopy, in general, is part of the initial approach for these patients, especially those with severe bleeding, in order to exclude a proximal cause of the bleeding.

The study protocol was approved by the Institutional Review Board of Hospital Sírio-Libanês; written informed consent was absent due to the retrospective nature of the study.

After clinical stabilization and an upper GI endoscopy without signs of bleeding, the patients underwent an antegrade preparation of the colon with a manitol (sorbitol) 10% solution, receiving 750–1500 ml within a period of 1–2 h. All examinations were done under sedation performed by an anesthesiologist. All colonoscopies were performed by the same medical team, using Olympus (Olympus Optical Co, Ltd., Tokyo, Japan) or Fujinon (Fujifilm Corporation, Tokyo, Japan) colonoscopes.

Patients' demographic and clinical characteristics were tabulated for analysis, and 95% confidence intervals (CI) were constructed when appropriate.

Results

Of the 234 patients, 63.2% (148) were male, 33% (77) were female and 3.8% were unknown. Most patients who presented with ALGIB were 70 or more years old (47.4%; 111) and 18.4% were between 60 and 69 years old (43). All patients underwent colonoscopy under hospitalization; none of them were outpatients.

All colonoscopies were performed within 6 h after presentation at the hospital. Concerning bowel preparation, 66.7% (156) were done with manitol solution and 22.2% (52) underwent retrograde preparation. According to the Boston preparation scale, 67.5% (158) were classified as having good preparation and 9.4% (22) as having inappropriate preparation.

The ileum was reached in all patients in whom a distal source of bleeding, such as bleeding due to anastomosis or diverticula bleeding from the left colon, was not identified. The predominant sources of bleeding were colonic diverticula (73 patients; 31%), followed by ischemic or infections colitis (18 patients; 7.7%) and radiation colitis (18 patients; 7.7%). Other causes observed are listed in Table 1. A specific therapeutic intervention was performed on 61 of the 151 patients who had the diagnosis confirmed (40.4%), according to the underlying source of bleeding (Table 2). Such interventions included electrocauterization, endoscopic epinephrine injection, argon plasma coagulation (APC), mechanical clipping and laser. Most patients with postpolypectomy bleeding were treated with injection of epinephrine (40%) and clipping (40%). Patients with angiodysplasia were treated predominantly with argon plasma coagulation (42%). Injection of epinephrine was the most frequent treatment, regardless of the source of bleeding (34.4%), followed by argon plasma coagulation (31.1%). Control of active hemorrhage was achieved endoscopically in 98.8% of the patients who underwent a therapeutic method. Only one patient, who presented with ALGIB secondary to colonic diverticula, did not have success with endoscopic treatment (epinephrine injection) and was referred to surgery.

Discussion

Our data shows that early colonoscopy in the management of patients with suspected ALGIB is a useful tool for diagnosis and treatment. Endoscopic treatment aims to stop active bleeding, reduce the risk of recurrence and mortality, decrease the need for transfusion, and avoid surgery. The endoscopic arresting of bleeding can abbreviate hospital stay and reduce

Table 1 – Main source of bleeding found at colonoscopy.			
Condition	Number of cases	Percentage (%)	Treatment
Colonic diverticula	73	31	10
Ischemic and infectious colitis	18	7.7	0
Radiation colitis	18	7.7	15
Neoplasms and polyps	16	6.8	2
Postpolypectomy	16	6.8	8
Undetermined	16	6.8	0
Bleeding after prostate biopsy	15	6.4	6
Bleeding proximal to the cecal valve	15	6.4	0
Anastomotic bleeding – surgical sutures	14	6.3	6
Angiodysplasia	12	5.1	7
Rectal ulcer	6	2.7	1
Others	6	2.5	5
Inflamatory bowel disease	5	2.1	0
Vascular stump	4	1.7	1
Total	234	100	61

Table 2 – Main therapeutic methods.	
Epinephrine injection	
Diverticular bleeding	8
Postpolypectomy	4
Anastomotic bleeding	2
After prostate biopsy	3
Vascular stump	2
Radiation colitis	1
Angiodysplasia	1
	21 (34.4%)
APC	
Radiation colitis	13
Angiodysplasia	3
Postpolypectomy	1
Anastomotic bleeding	1
Neoplasms and polyps	1
	19 (31.14%)
CLIP	
After prostate biopsy	4
Postpolypectomy	4
Anastomotic bleeding	3
Neoplasms and polyps	2
Vascular stump	1
Rectal ulcer	1
	15 (24.6%)
Esclerosis	
Angiodysplasia	3
Radiation colitis	1
Post-elastic band ligation	1
	5 (8.2%)
Laser	
Radiation colitis	2
	2 (3.3%)
Non-specified treatment	
Diverticular bleeding	2
Vascular stump	1
After prostate biopsy	1
Postpolypectomy	1
Perforating lesion of the colon	1
Other	1
	7 (11.5%)

treatment costs, as well as improve the diagnosis of the source of bleeding.[2,9] Colonoscopy thus seems to be one of the best therapeutic options for diagnosis of ALGIB and localization of bleeding sources. Although urgent colonoscopy presents a recurrence rate of early re-bleeding ranging from 15% to 22%, this method has the advantage of being potentially therapeutic, as the diagnosis rate varies from 60% to 97% in the literature.[18,19]

Identification of the bleeding source remains a diagnostic challenge. Approximately 10% of all patients will never have a source identified and up to 40% of patients with ALGIB have more than one potential bleeding source.[10,20] In our study, 35.4% of the patients (83 patients) had no source of bleeding identified before colonoscopy.

According to the literature, the main source of ALGIB is diverticulosis.[1] The majority (>75%) of colonic diverticula are found in the left colon; using colonoscopy, 60% of cases of diverticula bleeding can be observed on this side of the colon.[7] In our study, diverticula bleeding was the most frequent cause of ALGIB, followed by ischemic and infectious colitis.

Bleeding after prostate biopsy is a significant cause of ALGIB in our practice (6.4%), as the Urology Center excels in the diagnosis and treatment of prostate cancer.

Elderly patients are most likely to experience ischemia-related colitis because of underlying risk factors such as relative hypotension, heart failure, and arrhythmias – all clinical characteristics of patients with heart disease.

Postpolypectomy bleeding is another frequent source of ALGIB in the literature, and has been found to occur after 0.2–1.8% of colonoscopic polypectomies.[21,22] In regard to

angiodysplasias, our data is within the range cited in the literature (approximately 4.5%)[12] as a source of ALGIB.

The management of ALGIB is not standardized. Although there are several strategies for the diagnosis and treatment of patients with ALGIB, we believe that colonoscopy within 6 h after presentation can be performed safely with a high rate of success in identifying and often treating the specific cause of bleeding. With the continued advances in endoscopic technology, colonoscopy has become not only a diagnostic but also a useful therapeutic tool in the management of ALGIB.

The treatment of ALGIB using hemostatic methods has included epinephrine injection, mechanical clipping, argon plasma coagulation, electrical coagulation, and combined methods. All have similar efficacy. In our practice, endoscopic injection of epinephrine was the treatment most commonly used. This can be explained by the fact that this series was

collected from the last 26 years; in the past, only epinephrine injection or monopolar coagulation were available, but as the risk of perforation was too high with monopolar coagulation, epinephrine injection was the preferred option. Recently, there has been a preference for mechanical methods of hemostasis, such as the use of metal clips. Data on the recurrence rate of bleeding after endoscopic therapy are inconsistent: Jensen et al.[16] observed no recurrence, whereas Bloomfeld et al.[23] reported an early recurrence in 38% of patients. Only one patient in our series, in the endoscopically treated group, relapsed and was referred to surgery.

The diagnostic yield for urgent colonoscopy with regard to ALGIB is reported in the literature as 48–90%.[6,12]

Two publications report diagnostic yields of 89–97%[11,24] which perhaps is a reflection of more consistent use of urgent colonoscopy. Two other studies demonstrated that early colonoscopy is significantly associated with a shorter hospital stay.[4,25] In most studies, early colonoscopy is defined as being done within 12–24 h of admission. Some physicians perform colonoscopy on an unprepared bowel as blood is a laxative and the location of blood in the colon can provide information about the bleeding site. Chaudhry et al.[11] showed that, in patients with ALGIB, a high diagnostic yield (97%) and effective hemostasis could be obtained even without bowel preparation. They were able to control active bleeding in 17 of 27 patients (63%) by endoscopic intervention. However, current recommendations[13] advise cleansing the colon as thoroughly as possible in ALGIB, as this improves the evaluation of the mucosa, which in turn enhances recognition of smaller lesions and minimizes the risk of complications resulting from poor visualization. Bowel cleansing is usually performed with an electrolyte solution (manitol solution in our study). The endoscopist should attempt to reach the caecum whenever possible. This is important because a substantial proportion of bleeding sites are located in the right colon. In addition, the endoscopist should try to intubate the terminal ileum. Flowing blood from above is a clear indication of a more proximal bleeding site. Ohyama et al.[24] report that even under conditions of urgent colonoscopy, the caecum was inspected in 56% of patients, and that terminal ileum insertion was achieved in 27%. For diagnosing haemorrhoidal bleeding it is important to inspect the anal transitional zone with a retroflexed instrument and to perform proctoscopy (anoscopy).

The second aim of colonoscopy in cases of acute lower bleeding should be to identify patients with active bleeding or with a risk of re-bleeding. By analogy with endoscopic risk stratification in bleeding ulcers, Jensen et al.[16] have shown that evidence of active bleeding, visible vessels, and adherent clots is associated with a severe course or a higher rate of re-bleeding. Diagnostic interventions alone are unlikely to alter significant outcomes such as re-bleeding and need for surgery. However, stigmata are infrequently identified in the colon. Studies report stigmata of hemorrhage in 7.7–43% of cases.[26]

We believe that our data lends further support to the role of early colonoscopy in the management of patients with ALGIB; this procedure allows for a specific diagnosis and appropriate treatment in at least two-thirds of patients with suspected ALGIB. The retrospective nature of our clinical series on this topic allows for the assessment of the true impact of commonly utilized interventions, such as colonoscopy.

Conflicts of interest

The authors declare no conflicts of interest.

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