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Research Article

PREVALENCE AND CAUSE OF LOWER GASTROINTESTINAL BLEEDING IN ADULTS

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ABSTRACT

Background: Lower gastrointestinal bleeding (LGIB) often presents a challenging clinical situation. Acute LGIB is defined as bleeding that emanates from a source distal to the ligament of Treitz, and the colonoscopy is well established as the diagnostic procedure of choice.

Objective: To evaluate the results of colonoscopies performed to diagnose the cause of Acute Lower Gastrointestinal Bleeding (ALGIB) in the First Affiliated Peoples Hospital of Yangtze University at Jingzhou, Hubei, P.R. China.

Materials and methods: Colonoscopy procedures performed in the Endoscopy service of the First Peoples Hospital of Jingzhou in those patients admitted due to ALGIB from February 2017 to January 2018 were analyzed retrospectively. The studied variables were age, gender, clinical presentations (such as pain abdomen, syncope, melena and hematochezia), colonoscopic findings, comorbidities (such as hypertension, coronary artery disease, diabetes mellitus, ischemic stroke, benign malignancy, liver cirrhosis, and gastrointestinal surgery history), smoking and alcohol intake history, along with use of anticoagulants, antiplatelets and NSAIDs (non-aspirin).

Results: A total of 175 patients, 58.85% (n=103) were male and 41.15% (n=72) were female, who underwent colonoscopy examination for suspected ALGIB were reviewed retrospectively. The mean age of patient was (46.55±13.99), male: female ratio was 1.4:1. Of the total number of examinations performed, 10.28% (n=18) were normal. The colonic disease most often found in this study was Polyp 35.42% (n=62) followed by Inflammatory Bowel Disease 16.57% (n=29), Solitary Rectal Ulcer 8.57% (n=15), Unknown origin 8.57% (n=15), Hemorrhoids 7.42% (n=13), Growth 4.57% (n=8), Ischemic Colitis 3.42% (n=6), Diverticulosis 2.85% (n=5) and Vascular Ectasia 2.28% (n=4). The correlation between positive colonoscopy finding and age, smoking and alcohol intake history were statistically significant.

Conclusion: ALGIB is common among middle aged (35-55 years) and old aged (56-80 years) group and the commonest cause is Polyp. The colonoscopy showed to be an effective diagnostic method in the case of ALGIB. Most patients respond to conservative therapy.

Keywords: *LGIB, Colonoscopy, Haematochezia, Retrospective research.*

INTRODUCTION

Gastrointestinal (GI) bleeding is a problem that is frequently seen in the emergency department by doctors [1]. In the United States and United Kingdom hospital admission rate annually due to GI bleeding is 150/100000 and mortality rate among these patients is high, i.e., 5–10% [2].

Depending upon site GI bleeding is divided into upper and lower GI bleeding [3]. A lower Gastrointestinal Bleed is defined as bleeding that occurs from lower GI tract, distal to the ligament of Treitz and above the anus. The different part included are the last part of the duodenum and the whole area of the jejunum, ileum, colon, rectum, and anus [4].

In patients who presents with gastrointestinal (GI) hemorrhage, about 20–33% are cases of Lower gastrointestinal bleeding (LGIB). In Western countries, the annual incidence of LGIB is about 20–27 cases per 100,000 population [5]. In a recent study that takes place at National University Hospital of Iceland the incidence of acute lower GI bleed (ALGIB) was 87/100000/year [6]. Statistically upper GI bleeding (UGIB) is more than the LGIB, reason behind this is that LGIB is underreported because patient with LGIB usually don't visit the doctor for their problem. In a retrospective study patient with LGIB were analyzed, out of these patients, 46% have re-bleeding and in those patients' mortality rate was 13% within 5 years after hospitalization. In the same study, it was found that patient with LGIB with age more than 65% who are using antithrombotic medication, the risk of recurrence of bleeding and mortality increases [7].

LGIB is usually suspected when patients complain of haematochezia (passage of maroon or bright red blood or blood clots per rectum). This is different from the clinical presentation of upper GI bleeding, which includes haematemesis and/or malena. Approximately 85% of lower gastrointestinal bleeding involves the

colon, 10% are from bleeds that are actually upper gastrointestinal bleeds & present as haematochezia, and 3–5% involve the small intestines [8].

Once the bleeding is suspected to be coming from a lower GI source, it warrants an evaluation in all cases and proctosigmoidoscopy followed by colonoscopy is the examination of choice for diagnosis and treatment. It is also the most accurate method of imaging the lower gastrointestinal [9, 10].

LGIB has various causes that can be divided into different groups, these include: anatomic (diverticulosis); vascular (angiodysplasia, ischemic); inflammatory (infectious, idiopathic, and radiationinduced); and neoplastic. In a retrospective study in Detroit USA, analysis of 1100 patients with acute LGIB was done, all of whom were admitted to the surgical service of a single urban emergency hospital, Gayer et al determined that the most common aetiologies for bleeding in these patients were diverticulosis (33.5%), haemorrhoids (22.5%), and carcinoma (12.7%). In the study the investigators also found that most patients (55.5%) presented with haematochezia, with other frequent presentations were maroon stools (16.7%) & melena (11%) [11]. In another study that was done at National University Hospital of Iceland during 2010. In this study, all patient who underwent colonoscopy were included, 1134 patients underwent 1275 colonoscopies. Overall, 163 patients had ALGIB. The crude incidence for ALGIB was 87/100 000 inhabitants/year. The most common findings were diverticulosis (23%) and ischemic colitis (16%) [6]. A difference has been noticed between the West and the subcontinent in the frequency of different findings in patients with rectal bleeding. In China, lot of studies were done on aetiology and treatment of upper gastrointestinal bleeding but little work is done on the lower gastrointestinal tract. In a study carried out in 2010 in China, colonoscopy was performed in patients with lower gastrointestinal tract pathologies. The study shows colorectal cancer, colorectal polyps, colitis, anorectal disease and IBD were the most common etiologies of LGIB in the Chinese adult and elderly population, whereas colorectal polyps, chronic colitis and intussusception were the main causes of LGIB in Chinese children. Diverticulum, the most common cause of LGIB in Western populations, is uncommon in China [12].

The aim of this study was to update the findings of previous studies, along with identification of common pathologies causing acute lower gastrointestinal bleeding in our patients.

Objective:

To evaluate the results of colonoscopies performed to diagnose the cause of ALGIB in the First Affiliated Peoples Hospital of Yangtze University at Jingzhou, Hubei, P.R. China.

Research Methodology:

After approval by the Ethics Committee of Yangtze University, a retrospective study was conducted in the First Peoples Hospital of Jingzhou from the clinical data of the patients who underwent Colonoscopy for suspected ALGIB in the Department of Gastroenterology, from February 2017 till January 2018. The study endpoint was the analysis of the incidence of ALGIB and evaluating the possible risk factors.

Study Population:

From February 2017 till January 2018, a total number of 175 patients who underwent colonoscopy examination, for the suspected ALGIB, for the first time in Department of Gastroenterology, the First Peoples Hospital were included in our study. The total number of study population was divided into case (patients with haematochezia) and control (patients without haematochezia). Among 175 patients, 109 patients with haematochezia were divided as a case and 66 patients without haematochezia were taken as control.

Inclusion Criteria:

- All the patients with clinically suspected Acute Lower Gastrointestinal Bleeding admitted in Department of Gastroenterology, the First Peoples Hospital of Jingzhou.
    i. Case: patients presenting with haematochezia.
    ii. Control: patients without haematochezia.
- Undergone colonoscopy for the first time.

Exclusion Criteria:

- All the patients who are <14 yrs. And >80 yrs.
- All the patients with advanced lower gastrointestinal malignancies with distant metastasis.

MATERIALS AND METHOD

Colonoscopies in patients hospitalized due to ALGIB were retrospectively evaluated from February 2017 till January 2018. LGIB was defined as the presence of intestinal bleeding, hematochezia, or melena when the occurrence of UGIB was excluded by upper digestive endoscopy.

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

The colonoscopic examinations were performed in the Endoscopy Service of the First Peoples Hospital of Jingzhou, after the patients underwent an anterograde preparation of the colon. All the colonoscopies were performed by the same medical team.

Our analysis reviewed the medical charts and colonoscopy results of these patients retrospectively. The variables studied were:

a. Age
b. Gender
c. Clinical presentations (pain abdomen, syncope, melena and hematochezia)

d. Comorbidities (HTN, CAD, DM, Ischemic stroke, Benign Malignancy, Liver Cirrhosis, GI surgery history)
e. Smoking and alcohol intake history
f. Drugs use history (anticoagulants, antiplatelets, NSAIDs- non aspirin)
g. Laboratory parameters (Hb%, Plts., BUN, Cr)

Statistical Analysis:

SPSS 20.0 software was used to analyze all data. Clinical characteristics of patients were summarized as whole as well as described specifically for subgroups by descriptive studies. Quantitative values were expressed as their Mean± Standard Deviation (SD), Median, Minimum, Maximum and Range. After descriptive studies, the test of normality of data was checked by Shapiro-Wilk test, Independent t-test or Mann-Whitney U-test to assess the differences in the incidence levels of patients with Haematochezia and Non-Haematochezia. Continuous variables were tested with student t-test. A value of $P<0.05$ was considered statistically significant.

RESULTS

Of the 175 patient, 58.85% (103) were male and 41.15% (72) were female *(Table 1)*. The mean age of patients was 46.55±13.99 years, ranging from 14 to 79 years.

All the patients underwent an anterograde preparation of the colon before the clonoscopic examination. 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 colonic disease most often found in this study was polyp *(Chart 1)*. Polyp accounted for 35.42% of cases followed by inflammatory bowel disease (16.57%), solitary rectal ulcer (8.57%), unknown origin (8.57%), hemorrhoids (7.42%), suspected growth (4.57%), ischemic colitis (3.42%), diverticulosis (2.85%) and vascular ectasia (2.28%) *(Chart 2).* Of the total number of colonoscopic examinations performed, 18 (10.28%) were normal *(Table 2).*

As per gender distribution, we observed a higher frequency of polyp and hemorrhoids as a cause of lower gastrointestinal bleeding in male patients and a slight predominance of inflammatory bowel disease was observed among female patients *(Chart 3).*

As per age distribution, higher incidence of polyp and inflammatory bowel disease was observed among middle age group (36-55 years) whereas suspected growth and diverticulosis was predominantly observed among old age group (56-80 years) *(Chart 4)*.

Majority of patients presenting with complaints of hematochezia were suspected for acute lower gastrointestinal bleeding, whereas in small proportion of patients with melena, acute lower gastrointestinal bleeding was suspected once the occurrence of upper gastrointestinal bleeding was excluded by upper digestive endoscopy *(Chart 5)*.

Higher incidence of acute lower gastrointestinal bleeding was observed in preexisting hypertensive patients as compared to patients with other comorbidities *(Chart 6)*.

The comparison analysis of clinicoepidemiological characteristics of the study population was done and we found that the patients with haematochezia were aged 51.35±13.19 years, comparable with 43.65±13.71 years in patients with non-haematochezia. There was significant differences between patients with haematochezia and patients with non-haematochezia in status of age ($p<0.001$), smoking ($p=0.04$), alcohol intake ($p=0.02$), abdomen pain ($p<0.001$), syncope ($p<0.001$), melena* ($p<0.001$), polyp ($p<0.001$), IBD ($p<0.001$), haemorroids ($p=0.04$), suspected growth ($p=0.026$) and ischemic colitis ($p<0.001$), whereas parameters like gender, HTN, CAD, GI surgery history, benign malignancy, ischemic stroke, liver cirrhosis, DM, drug use history and blood parameters could not show any significant difference *(Table 3)*, perhaps due to smaller sample size of our study.

(* patients ruled out for upper gastrointestinal bleeding after upper digestive endoscopy.)

Gender	Number of patients	Percentage
Male	103	58.85%
Female	72	41.15%
Total	175	100

Table 1: Gender Distribution of patients undergoing colonoscopy due to suspected ALGIB

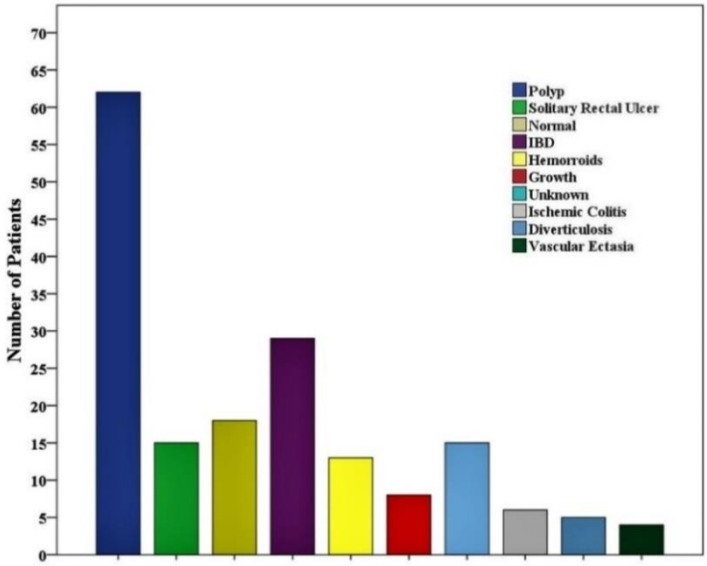

Chart 1: A Bar Chart indicating the causes of LGIB.

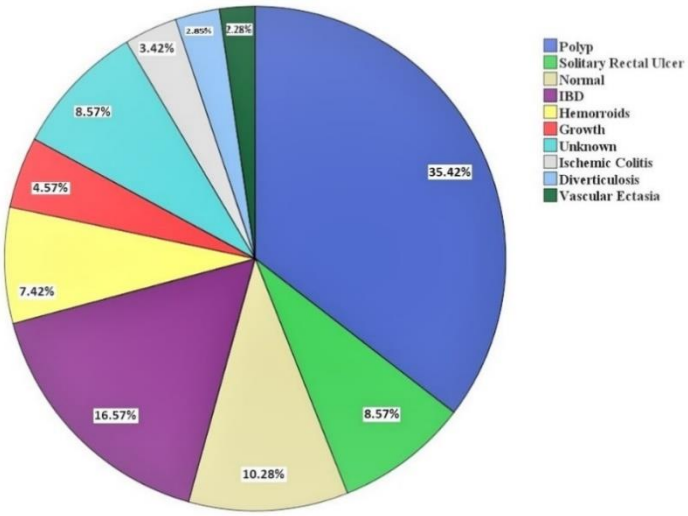

Chart 2: A Pie Chart indicating the causes of LGIB in percentage.

Colonoscopic Findings	**Male**	**Female**	**Total**	**Percentage**
Polyp	36	26	62	35.42
Solitary Rectal Ulcer (SRU)	9	6	15	8.57
Normal	10	8	18	10.28
Inflammatory Bowel Disease (IBD)	13	16	29	16.57
Haemorrhoids	11	2	13	7.42
Growth	5	3	8	4.57
Unknown	10	5	15	8.57
Ischemic Colitis	3	3	6	3.42
Diverticulosis	4	1	5	2.85
Vascular Ectasia	1	3	4	2.28
Total	**103**	**72**	**175**	**100**

Table 2: A Table indicating the colonscopic findings among male and female patients.

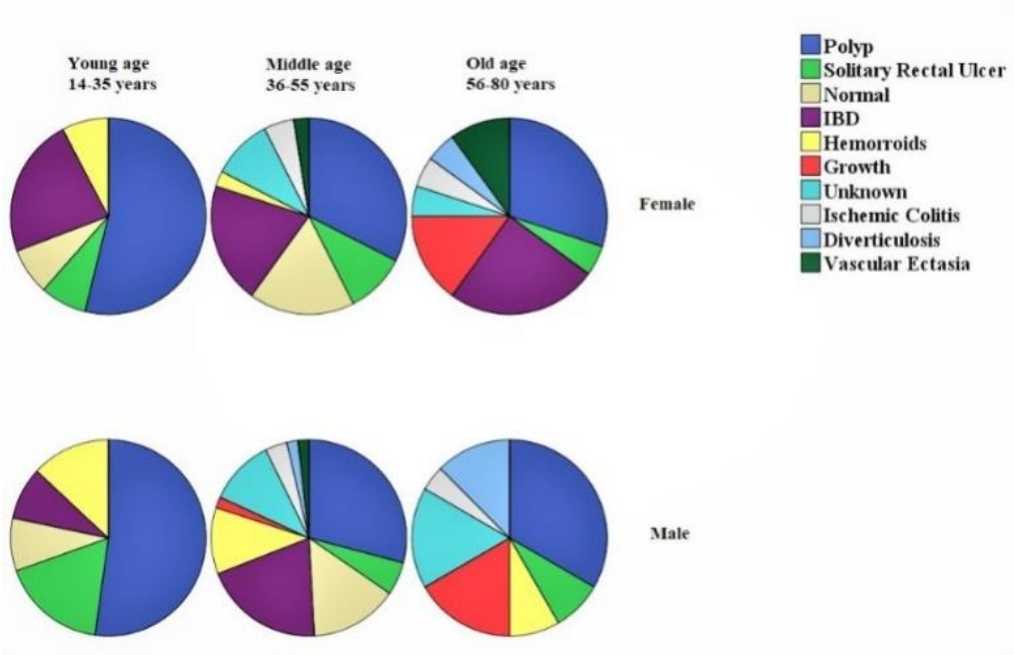

Chart 3: A Pie Chart indicating the comparison of prevalence of LGIB among male and female cases.

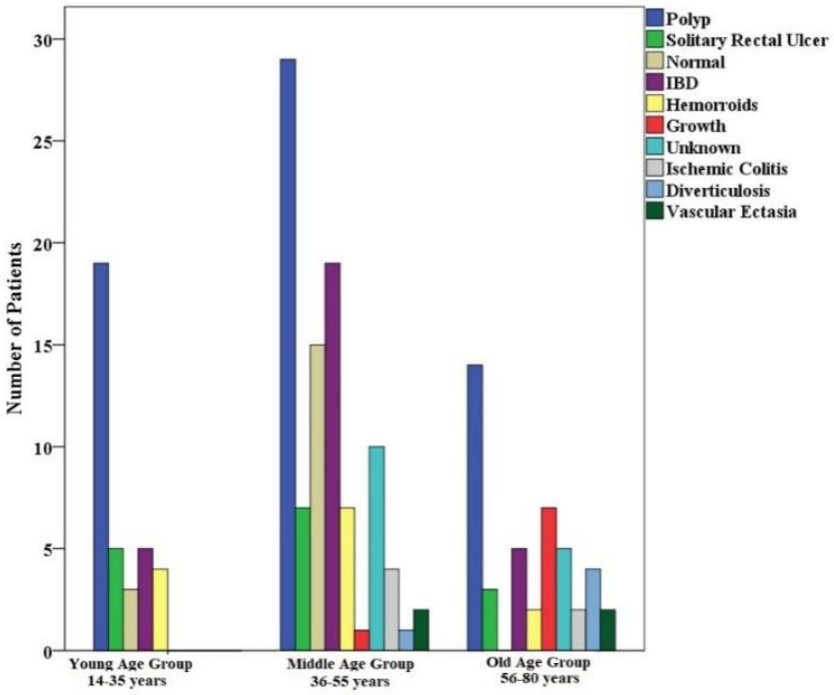

Chart 4: A Bar Chart showing the incidence of LGIB among different age groups.

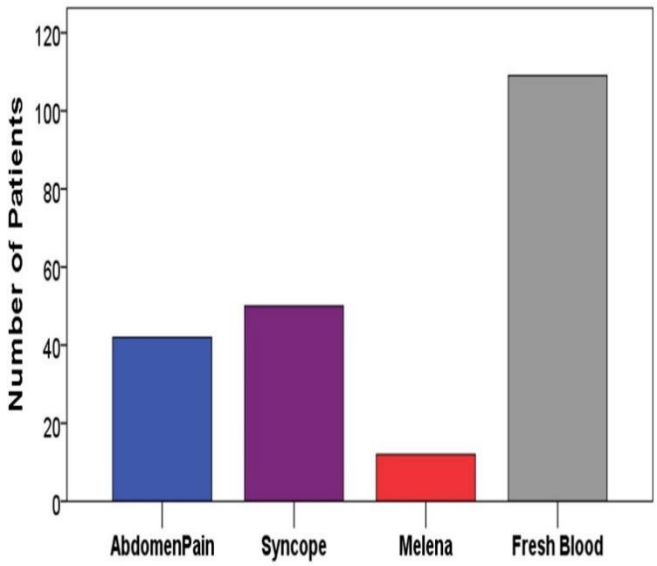

Chart 5: A Bar Chart showing the number of patients with presenting chief complaints.

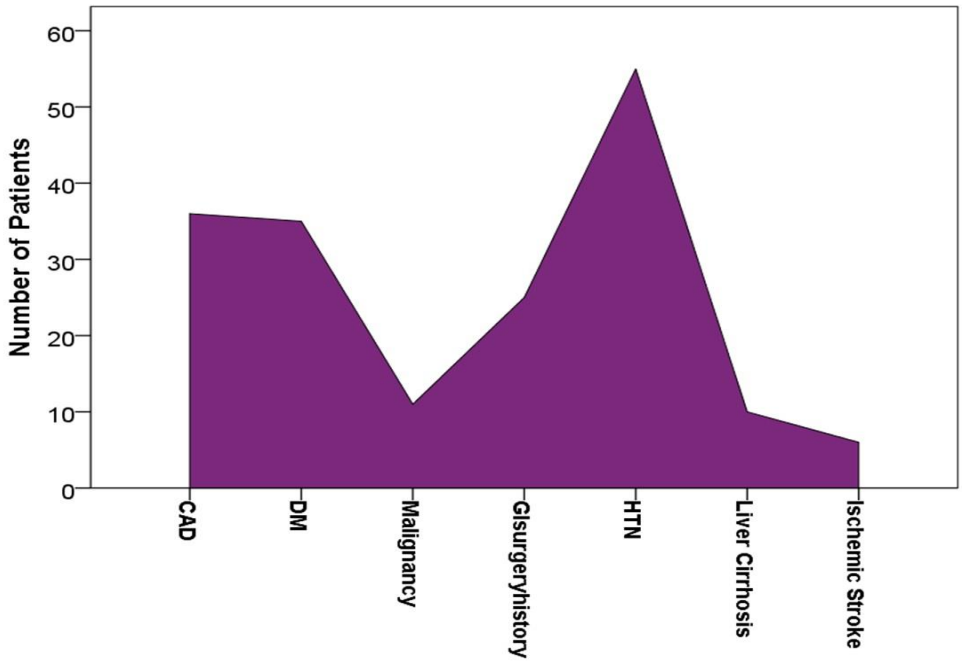

Chart 6: Incidence comparison of LGIB with pre-existing comorbidities.

Characteristics		**Haematochezia (n=109)**	**Non- Haematochezia (n=66)**	**p value**
Age (years)	Mean ± Std.	51.35±13.19	43.65±13.71	<0.001
	Min/Max	18/79	14/77	
	Median	52	42	
	Range	61	63	
Gender	Male	67 (61.46%)	36(54.54%)	0.37
	Female	42 (38.54%)	30(45.46%)	
Hypertension (HTN)	Yes	31(28.44%)	24(36.36%)	0.274
	No	78(71.56%)	42(63.64%)	
Coronary Artery Disease (CAD)	Yes	17(15.59%)	19(28.78%)	0.36
	No	92(84.41%)	47(71.22%)	
GI Surgeries History	Yes	14(12.84%)	11(16.66%)	0.484
	No	95(87.16%)	55(83.34%)	
Benign Malignancy	Yes	4(3.66%)	7(10.60%)	0.67
	No	105(96.34%)	59(89.40%)	
Ischemic Stroke	Yes	2(1.83%)	4 (6.06%)	0.136
	No	107(98.17%)	62(93.94%)	
Liver Cirrhosis	Yes	3 (2.75%)	7(10.60%)	0.30
	No	106(97.25%)	59(89.40%)	
Diabetes Mellitus (DM)	Yes	31(18.35%)	15(22.72%)	0.483
	No	89(81.65%)	51(77.28%)	
Smoking	Yes	40(36.70%)	39(59.10%)	0.04
	No	69(63.30%)	27(40.90%)	
Alcohol	Yes	68(62.38%)	56(84.84%)	0.02
	No	41(37.62%)	10(15.16%)	
Abdomen pain	Yes	12(11.00%)	30(45.46%)	<0.001
	No	97(89.00%)	36(54.54%)	
Syncope	Yes	12(11.00%)	38(57.58%)	<0.001
	No	97(89.00%)	28(42.42%)	
Melena	Yes	0(0.00%)	12(18.18%)	<0.001
	No	109(100.00%)	54(81.82%)	
Polyp	Yes	55(50.45%)	7(10.60%)	<0.001
	No	54(49.55%)	59(89.40%)	
Solitary Rectal Ulcer	Yes	6(5.50%)	9(13.63%)	0.063

	No	103(94.50%)	57(86.37%)	
No Finding	Yes	0(0.00%)	18(27.27%)	<0.001
	No	109(100%)	48(72.73%)	
Inflammatory Bowel Disease (IBD)	Yes	27(24.77%)	2(3.03%)	<0.001
	No	82(75.23%)	64(96.97%)	
Haemorroids	Yes	13(11.92%)	0(0.00%)	0.04
	No	96(88.08%)	66(100.00%)	
Growth	Yes	2(1.83%)	6(9.09%)	0.026
	No	107(98.17%)	60(90.91%)	
Unknown	Yes	0(0.00%)	15(22.72%)	<0.001
	No	109(100.00%)	51(77.28%)	
Ischemic Colitis	Yes	0(0.00%)	6(9.09%)	<0.001
	No	109(100.00%)	60(90.91%)	
Diverticulosis	Yes	2(1.83%)	3(4.54%)	0.297
	No	107(98.17%)	63(95.46%)	
Vascular Ectasia	Yes	4(3.66%)	0(0.00%)	0.115
	No	105(96.34%)	66(100.00%)	
Anticoagulants	Yes	9(8.25%)	6(9.09%)	0.849
	No	100(91.75%)	60(90.91%)	
Antiplatelets	Yes	25(22.93%)	15(22.72%)	0.975
	No	84(77.07%)	51(77.28%)	
NSAID - non aspirin	Yes	29(26.60%)	15(22.72%)	0.567
	No	80(73.40%)	51(77.28%)	
Haemoglobin (g/dl)	Mean ± Std.	11.13±1.51	10.95±1.67	0.547
	Min/Max	7.10/13.50	7.0/13.30	
	Median	11.2	11.0	
	Range	6.40	6.3	
Platelet(10^9/L)	Mean ± Std.	277.65±62.61	266.35±72.75	0.246
	Min/Max	176/421	135/450	
	Median	273	256	
	Range	245	315	
Blood Urea Nitrogen (BUN) (mmol/L)	Mean ± Std.	4.96±0.88	4.83±0.96	0.450
	Min/Max	2.50/6.40	2.50/6.50	
	Median	5.2	4.9	
	Range	3.9	4.0	

Creatinine(µmol/L)	Mean ± Std.	115.90±23.37	112.07±23.32	0.324
	Min/Max	70/150	73/150	
	Median	123	110.5	
	Range	80	77	

Table 3: Clinicoepidemiological features of Patients with LGIB.

DISCUSSION

Acute Lower Gastrointestinal Bleeding is an emergency situation often found in emergency rooms. Its consequences can be even more catastrophic as this bleeding affects a population with more advanced age [13]. Thus, the definition of the bleeding site and its specific treatment are of paramount importance [14]. Where available, colonoscopy should be used in these clinical pictures, considering its diagnostic accuracy and the possibility of its therapeutic use in particular circumstances [13, 15].

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 treatment costs, as well as improve the diagnosis of the source of bleeding [18, 19]. 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 rebleeding 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 [20, 21].

The colonoscopies were inconclusive in 8.57% of cases, a finding consistent with that found in the literature [16]. A large area of the small intestine is not covered in this exam, due to the limitations inherent to this method. Procedures such as scintigraphy and arteriography can be used for the definition of the bleeding site in these cases or in cases where it was not possible to define the precise location of the lesion [15]. Scintigraphy detects active bleeding with a volume from 0.1 to 0.5mL/min. and its main disadvantage is the inaccurate location of the focus of bleeding. On the other hand, arteriography is more invasive method and requires a bleeding volume of 0.5mL/min. for its detection [15]. Arteriography may also be used as a therapeutic tool. Embolization for hemorrhage due to a diverticular bleeding can reach a success rate of 85% [17]. Enteroscopy and capsule endoscopy can be used to establish the diagnosis in the case of termination of bleeding [15].

The diagnostic yield of colonoscopy in LGIB in our study has been found to be 92.43%, which supports almost similar results in other studies, e.g. Chaudhry et al. [23].

In this study, polyp presented itself as the most frequent cause of LGIB, observed in 62 (35.42%) patients, which is slightly different as compared to a Chinese literature [12]. In 22.8% of cases, Lopes et al. attributed to colon and rectum polyps the cause of LGIB [25]. Inflammatory bowel disease was more common in

women than in men, surpassing even cancer as a cause of bleeding; these data are similar to those of Bounds et al. [13]. All cases of bleeding secondary to IBD were classified as unspecific colitis or rectitis. This is probably due to the difficulty of the endoscopist in determining the etiology, without having access to more detailed information on the patient [22]. In this study, hemorrhoids were more common in males than females unlike other studies e.g. Lorenzo-Rivero et al., where the incidence of hemorrhoids was observed same in male and female [24]. Diverticulosis and vascular ectasia were among infrequent causes of LGIB in our study, which is consistent enough with other studies like Yu Bai et al. [12].

Significant differences in the comparison analysis was observed in our study between patients with haematochezia and patients with non-haematochezia in status of age, smoking, alcohol intake, abdomen pain, syncope, patients ruled out for UGIB presenting with melena, polyp, IBD, hemorrhoids, suspected growth and ischemic colitis, whereas parameters like gender, HTN, CAD, GI surgery history, benign malignancy, ischemic stroke, liver cirrhosis, DM, drug use history and blood parameters could not show any significant difference. Perhaps with a larger sample size study, a more definitive correlation can be ascertained with these clinicoepidemiological characteristics.

Limitation:

The sample size is relatively small due to which definitive correlation significance with various clinicoepidemiological characteristics could not be ascertained. Therefore, larger sample size study needs to be conducted to obtain clearer and more definitive correlation significance.

CONCLUSION

Colonoscopy has proven to be an effective method in the diagnosis of cases of acute lower gastrointestinal bleeding. ALGIB is common among middle aged (35-55 years) and old aged (56-80 years) group. Polyp was the disease most often associated with these cases, followed by inflammatory bowel disease. Diverticulitis, most common cause of LGIB in Western population, is uncommon in China.

Conflicts of interest: The authors declare no conflicts of interest.

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