Original Article

Is Urgent Diagnostic Colonoscopy still Necessary in Lower Gastrointestinal Bleeding?: A Retrospective Study from 2 Centers of Ramathibodi Hospital

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Background: An urgent colonoscopy within 24 hours in acute lower gastrointestinal bleeding (LGIB) is now controversy with limited of benefit compare to elective colonoscopy. An alternative modality such as CT angiogram or CT whole abdominal has play an important role in diagnosed and localised bleeding site in emergency setting.

Objective: This study is aim to report a descriptive data of incidence and prevalence of acute LGIB and therapeutic modality from 2 centers of Ramathibodi Hospital.

Materials and Methods: A retrospective reviewed of adult patients who had acute LGIB in 4 years of Acute Care Surgery service of Ramathibodi Hospital and one year service of Chakri Naruebodindra Medical Institute. An exclusion criteria were patients who had associated gastrointestinal perforation or dead on arrival. A descriptive data were analysed and reported.

Results: A 127 patients were enrolled, an average age is 69 year-old. Of these, there are 74.01% admitted without hemorrhagic shock. An average hospital stay is 3 days (1 to 5). Anti-coagulant and anti-platelet usage are 40.16%. Average haemoglobin on admission is 9.69±2.43 g/dL. Overall mortality rate is 4.72%. Most common cause of acute LGIB are diverticular bleeding 34.65% and colitis 17.32%. Only 9.82% underwent urgent colonoscopy. There are 95.28%, 1.57%, 0.79%, and 1.57% of successful non-operative management, therapeutic endoscopy, transarterial catheter embolization and surgery, respectively. Only patients who had post-polypectomy bleeding underwent urgent therapeutic endoscopy intervention.

Conclusion: In hemodynamic stable, urgent colonoscopy is not mandate in routine. In acute massive LGIB which hemodynamic unstable, the CT angiography follow by arterial embolisation or urgent colonoscopy are recommend for diagnosed, localised the bleeding site, and also endoscopic intervention especially in post-procedure bleeding.

Keywords: Lower gastrointestinal bleeding; Urgent colonoscope; CT angiogram; Abdominal CT scan

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Acute lower gastrointestinal bleeding (LGIB) is one of a common cause of consultation and hospitalisation in Acute Care Surgery service (ACSx)[1,2]. Unlike acute upper gastrointestinal bleeding (UGIB), the mortality rate of LGIB is low about 3 to 4%[1,3]. Modality of investigation for diagnosed and localised bleeding site of acute LGIB after appropriate and adequate fluid and blood components resuscitation are comprise of colonoscopy, computed

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tomography(CT) angiography, computed tomography of whole abdomen (CTWA), angiography, or red blood cell (RBC) scan. Colonoscopy and angiography has many benefit of localised bleeding point, diagnosis and including of therapeutic intervention such as application of hemoclip, cauterization, and trans-arterial catheter embolization[4]. Urgent colonoscopy within 24 hours with rapid bowel preparation in acute LGIB after admission is suggested by The American Society for Gastrointestinal Endoscopy (ASGE), after excluding of upper gastrointestinal bleeding by nasogastric (NG) lavage and/or esophagogastro-duodenoscopy (EGD)[4]. But urgent colonoscopy within 24 hours is now controversy of benefit because of more than 80% LGIB has spontaneous cessation of bleeding[5]. Kherad et al[6] reported a meta-analysis of randomised control trial (RCT) in limited benefit of early or urgent colonoscopy with no statistical different of re-bleeding rate compare to elective colonoscopy. So, early colonoscopy is not a routine management. Some hospitals are not available for colonoscopy in the night shift so delayed colonoscopy is inevitable. Some study preferred urgency colonoscope in the setting of bleeding diverticulum to visualised the bleeding point and immediate endoscopic intervention which can decrease surgical exploration rate[7]. In contrary, some study reported of no benefit of urgent colonoscopy within 24 hours in the topic of decreased of surgery requirement or intervention needed[6]. This because of different in cause of bleeding such as LGIB from colorectal tumor so a surgical resection is mandate. The other reason of limitation of urgent colonoscopy is massive hematochezia which usually fail and difficult to localised bleeding site due to flooding of blood component along colon cause limitation of visual field. In this situation, computed tomography angiography (CTA) or contrast-enhanced computed tomography of whole abdomen (CTWA) are non-invasive investigation that play an important role of diagnosed and localised bleeding site[8]. So, CT angiography or contrast-enhanced CTWA might be an alternative choice in massive or even non-massive LGIB apart from urgent colonoscope, so elective colonoscopy can be address later. The present study aim to report a descriptive data of incidence and prevalence of acute LGIB and needs of urgent therapeutic colonoscopy from 2 centers of Ramathibodi Hospital.

Materials and Methods

We retrospective reviewed and collected data of patients age over 14 years who had lower gastrointestinal bleeding (LGIB) in the Acute Care Surgery service of a Ramathibodi Hospital, from 1 August 2015 through 30 November 2019 and one year service, from 1 January 2019 through 31 December 2019, of Chakri Naruebodindra Medical Institute which is a new centre of Ramathibodi Hospital. An exclusion criteria were patients age less than 15 year-old, patients who had associated gastrointestinal perforation, and dead on arrival. A demographic data included age, gender, investigations of choice, diagnosis, results of endoscopic findings, treatment modalities to stop the bleeding, length of hospital stay, complication, re-bleeding rate, operation rate, and death were collected from medical records.

A definition of "therapeutic endoscopy" or "need endoscopic intervention" is lesion that need endoscopic procedure to stop the bleeding such as application of hemoclip, cauterization, argon plasma coagulation (APC). Excluding of biopsy of tumor or cancer for pathologic diagnosis or polypectomy of non-bleeding incidental finding of colorectal polyp. A "non-operative management" is supportive management without invasive procedure such as observation of abdominal sign, maintain hemodynamics by infusion of intravenous fluid and/or blood components, follow haemoglobin, and antibiotics. Statistical analysis was conducted using Stata 14.2 software (StataCorp LLC, College Station, TX, USA). Continuous variables are summarized using mean, standard deviation, and median. Categorical variables are summarized using Chi-square and presented as percentage.

The present study was approve by ethics committee, Faculty of Medicine Ramathibodi Hospital, Mahidol University (No. MURA2021/278).

Results

A total of 127 cases were enrolled. General demographic data has shown in Table 1. An average age is 69 year-old, 59 (46.46%) cases are male and 68 (53.54%) cases are female. Six (4.72%) cases died from patients co-mobidities not from acute LGIB (data not show). Anti-coagulant and anti-platelet usage is 51 (40.16%) cases which cause colonic ulcer and bleeding in 2 (1.57%) cases. An average length of

Table 1. A Demographic data of patients who had acute LGIB of 2 centres of Ramathibodi Hospital

Parameters	Total n=127
Age (years): mean±SD	69 (14)
Sex, n (%)	
Male	59 (46.46)
Female	68 (53.54)
Dead, n (%)	6 (4.72)
LOS (days): median (range)	3 (1 to 5)
Anticoagulant/Antiplatelet usage, n (%)	51 (40.16)
SBP (mmHg), mean□SD	126.86□28.43
DBP (mmHg), mean□SD	68.74□12.83
Hb on admission (g/dL), mean□SD	9.69□2.43
Shock on admission, n (%)	
No hemorrhagic shock or hemorrhagic shock class 1	94 (74.01)
Hemorrhagic shock class 2	18 (14.17)
Hemorrhagic shock class 3	15 (11.81)
Hemorrhagic shock class 4	0

LGIB = Lower gastrointestinal bleeding

hospital stay is 3 (1 to 5) days. A systolic blood pressure (SBP) and diastolic blood pressure (DBP) on admission are 126.86±28.43 and 68.74±12.83 mmHg, respectively. An average haemoglobin on admission is 9.69±2.43 g/dL. There is 94 (74.01%) cases had no sign of hemorrhagic shock on admission, 18 (14.17%) cases had hemorrhagic shock class 2, 15 (11.81%) cases had hemorrhagic shock class 3, and no patients develop profound shock or hemorrhagic shock class 4.

A final diagnosis of acute LGIB has shown in Table 2, there are diverticular bleeding 44 (34.65%), colitis 22 (17.32%), colorectal cancer 21 (16.54%), colonic polyp without active bleeding 12 (9.45%), anorectal disease 11 (8.66%), upper gastrointestinal bleeding (UGIB) 7 (5.51%), colonic ulcer 2 (1.57%), post-polypectomy bleeding 2 (1.57%), arteriovenous malformation (AVM) 2 (1.57%), warfarin overdose 1 (0.79%), aortic aneurysm 1 (0.79%), aorto-enteric fistula 1 (0.79%), and hemangioma 1 (0.79%) case.

An investigation modalities has shown in Table 3.

Table 2. A prevalence of acute lower gastrointestinal bleeding of 2 centres of Ramathibodi Hospital

Diagnosis	n (%)
Diverticular bleeding	44 (34.65)
Colitis	22 (17.32)
Colorectal cancer	21 (16.54)
Colorectal polyp	12 (9.45)
Anorectal disease	11 (8.66)
Upper gastrointestinal bleeding (UGIB)	7 (5.51)
Colonic ulcer	2 (1.57)
Post-polypectomy bleeding	2 (1.57)
Aterio-venous malformation (AVM)	2 (1.57)
Warfarin overdose	1 (0.79)
Aortic aneurysm	1 (0.79)
Aorto-enteric fistula	1 (0.79)
Hemangioma	1 (0.79)

There is 112 cases underwent colonoscopy. Of these 112 cases, there are only 11 (9.82%) cases had urgent colonoscopy within 24 hours and 101 (90.18%) cases had delayed or elective colonoscopy after 24 hours. There were 2 patients had re-bleeding after colonoscope, both are diverticular bleeding. Twenty seven patients had CTA or contrast-enhanced CTWA for investigation of diagnosed and localised bleeding site. Of these 27 cases, there are 12 (44.44%) cases undergo CT scan (either CTA or contrast-enhanced CTWA) within 24 hours and 11 (40.74%) cases after 24 hours. There are 12 (9.45%) cases received both CT angiogram/contrast-enhanced CTWA and colonoscopy because of diagnosed colorectal tumor from CT scan and need tissue biopsy. In patients who undergo CT scan, there are only 4 (14.81%) cases had active contrast extravasations and further embolisation was performed only 1 case, in 3 cases were not found contrast extravasation from conventional angiography so embolisation was omitted.

The summary of therapeutic modalities has shown in Table 4. There were successful of non-operative management 122 (96.01%) cases, therapeutic endoscopy 2 (1.57%) cases, transarterila embolisation 1 (0.79%) case, underwent surgery due to recurrent diverticular bleeding in 2 (1.57%) cases. There are only 2 cases (1.57%) of post-polypectomy bleeding underwent therapeutic endoscopy by applied hemoclips to stop the bleeding.

Discussion

Acute lower gastrointestinal bleeding (LGIB) is one of the common problems consultation and hospitalisation of emergency surgery service. The American Society for Gastrointestinal Endoscopy (ASGE) and American College of Gastroenterology (ACG) guideline recommendation of performed urgent colonoscopy within 24 hours after hemodynamic stabilisation and excluding of UGIB[4,9]. However, many recent studies propose no advantage of this recommendation regarding of decreasing mortality rate, re-bleeding and intervention rate[3,9-12]. A majority of bleeding cause of acute LGIB in our study is diverticular bleeding which is similar to many of previous study[9-13].

Neha Nigan et al[3] reported of no significant different in 30-days mortality of urgent colonoscopy compare to delayed colonoscopy but shorter hospital stay from 5

Table 3. Subgroup analysis of investigation modalities

Investigation modallities	Timing of investigation	n (%)
Colonoscopy (n=112)	≤24 hours (urgent)	11 (9.82)
	>24 hours (delayed)	101 (90.18)
CT angiogram/CT whole abdomen (n=27)	≤24 hours	12 (44.44)
	>24 hours	15 (55.56)
CT detected of active contrast extravasation		4 (14.81)

CT = computed tomography

Table 4. Therapeutic modality of acute LGIB patients

Therapeutic modality, n=127	Total, n (%)
Non-therapeutic management	122 (96.01)
Therapeutic endoscopy	2 (1.57)
Embolization	1 (0.79)
Surgery	2 (1.57)

LGIB = Lower gastrointestinal bleeding

days to 3 days. In our study, an average hospital stay is 3 days despite more than 90% of delayed colonoscopy was performed. This might be cause of the most common cause is diverticular bleeding which resolves spontaneously over 80% and non-operative management is mostly successful[13,14]. Endoscopic findings of diverticular bleeding is mostly diagnosed by indirect evidence of only blood stain in nearby diverticulum, rarely seen active arterial bleeding, so endoscopic intervention is not necessary. Niikura et al[5] reported an incidence of 12.7% has definite diagnosis of diverticular bleeding from urgent colonoscopy and endoscopic intervention needed. The higher detection rate is around 40 hours by experience endoscopist so diagnostic yield is not improved with urgent colonoscopy. Cirocchi, et al reported a mandatory of contrast-enhanced CT before urgent colonoscopy aim to enhanced endoscopic hemostasis effectiveness[14]. But in our practice, if CT found contrast extravasation a transarterial embolisation to stop the bleeding is mandate because of easier to see bleeding site than colonoscopy which might be difficult by flooding of blood. Recurrent bleeding of diverticulum is around 15% in first year and 30% by the end of second year with no definite recommendation for treatment of this recurrent[14]. In our study, recurrent bleeding of diverticulum underwent surgical resection because of hemodynamically unstable and old-age patient with co-morbid heart disease who might be intorelance with anemia and volume overload from blood components transfusion.

Neha Nigam, et al[3] reported of endoscopic intervention during colonoscopy is only 3%. The diagnosis of colonic ateriovenous malformation (AVM) is associated with increases therapeutic endoscopy to stop the bleeding, $p<0.0001$. Contrary to our study, diagnosis of AVM is uncommon only 1.57%, this bleeding can resolved spontaneously at the time of colonoscope so endoscopic intervention is not performed. Some study also reported an overall 30-days mortality rate is 2.5 to 3% which is similar to our study[3,5]. Mortality is depend on a final diagnosis, degree of hemorrhagic shock, and co-morbidities so urgent colonoscopy is not necessary in alter the mortality outcome[5]. In our study, endoscopic intervention during colonoscopy by application of hemoclip is only 1.57% in case of post-polypectomy bleeding because known of definitive cause and location of bleeding. Basically, the post-polypectomy bleeding is arterial bleed but not resolve spontaneously like diverticular bleeding so endoscopic intervention is necessary. In massive bleeding which failure of colonoscopy occur due to flooding of blood. The alternative investigation for decision making of further management is CTA or contrast-enhanced CTWA should performed for diagnosed and localised of bleeding site. David J Werner, et al[15] reported a 90% success rate of transarterial catheter embolisation (TCE) for bleeding that cannot treat by endoscopic intervention and ongoing bleeding. In this situation CT angiography need to performed to detecting and mapping before embolization with specificity of 92 to 95% and positive predictive value of 86%. In our study, CT angiography or contrast-enhanced CTWA with arterial phase was performed to located the bleeding cause and site of bleeding by contrast extravasation. If contrast extravasation is found, embolization is mandate for cessation of bleeding but if no contrast extravasation the bleeding cause is still able to identify by CT scan such as tumor or colitis. This no needs of endoscopic intervention to stop bleeding. Kennedy, et al[16] reported CT angiography has play an important role before embolization with 92% of negative contrast extravasation had no need for further management. Limitations in our study are small number of participants. Urgent colonoscopy is performed only 9.82% patients which is too much lower from delayed colonoscopy 90.18%, so subgroup analysis might be unreliable. The hospital congested condition that cannot admitted the patients for emergency bowel preparation to undergo urgent colonoscopy within 24 hours. However, our study show non-inferior results in mortality rate or hospital stay when compare to previous study. Further study to compare between the two groups and subgroup analysis for management in each disease should be addressed.

In conclusion, the most common of the bleeding cause in LGIB is diverticular bleeding which can resolves spontaneously up to 90%. In hemodynamic stable, an urgent colonoscopy is not mandate in routine. In acute massive LGIB which hemodynamic unstable, the CT angiography follow by arterial embolisation or urgent colonoscopy are recommend for diagnosis, localise the bleeding site, and also perform endoscopic intervention especially in post-procedure bleeding.

What is already known on this topic?

We already known that acute LGIB is resolves spontaneously more than 80% and role of surgery is limited in some situation such as the patients develop hemodynamic unstability. Colonoscopy should undergo urgently within 24 hours after excluding of UGIB.

What this study adds?

The present study shows urgent colonoscopy within 24 hours is not mandate in routine. Therapeutic endoscopy has play an important role in post-polypectomy bleeding or post-procedure bleeding. Alternative investigation is CT angiography or contrast-enhanced CT whole abdomen for diagnosed and localised bleeding site for further management.

Potential conflicts of interest

The authors declare no conflict of interest.

References

1. Strate LL. Lower GI bleeding: epidemiology and diagnosis. Gastroenterol Clin North Am 2005;34:643-64.
2. Krutsri C, Thampongsa T, Sumritpradit P, Singhatat P. Impact of an acute care surgery service on timeliness of care at Ramathibodi Hospital. J Med Assoc Thai 2018;101:195-201.
3. Nigam N, Patel P, Sengupta N. Outcomes of early versus delayed colonoscopy in lower gastrointestinal bleeding using a hospital administrative database. J Clin Gastroenterol 2018;52:721-5.
4. Pasha SF, Shergill A, Acosta RD, Chandrasekhara V, Chathadi KV, Early D, et al. The role of endoscopy in the patient with lower GI bleeding. Gastrointest Endosc 2014;79:875-85.
5. Niikura R, Nagata N, Yamada A, Honda T, Hasatani K, Ishii N, et al. Efficacy and safety of early vs elective colonoscopy for acute lower gastrointestinal bleeding. Gastroenterology 2020;158:168-75.e6.
6. Kherad O, Restellini S, Almadi M, Strate LL, Menard C, Martel M, et al. Systematic review with meta-analysis: limited benefits from early colonoscopy in acute lower gastrointestinal bleeding. Aliment Pharmacol Ther 2020;52:774-88.
7. Jensen DM, Machicado GA, Jutabha R, Kovacs TO. Urgent colonoscopy for the diagnosis and treatment of severe diverticular hemorrhage. N Engl J Med 2000;342:78-82.
8. Clerc D, Grass F, Schafer M, Denys A, Demartines N, Hubner M. Lower gastrointestinal bleeding-Computed Tomographic Angiography, Colonoscopy or both? World J Emerg Surg 2017;12:1.
9. Strate LL, Gralnek IM. ACG clinical guideline: management of patients with acute lower gastrointestinal bleeding. Am J Gastroenterol 2016;111:459-74.
10. Green BT, Rockey DC, Portwood G, Tarnasky PR, Guarisco S, Branch MS, et al. Urgent colonoscopy for evaluation and management of acute lower gastrointestinal hemorrhage: a randomized controlled trial. Am J Gastroenterol 2005;100:2395-402.
11. Laine L, Shah A. Randomized trial of urgent vs. elective colonoscopy in patients hospitalized with lower GI bleeding. Am J Gastroenterol 2010;105:2636-41; quiz 42.
12. van Rongen I, Thomassen BJW, Perk LE. Early versus standard colonoscopy: a randomized controlled trial in patients with acute lower gastrointestinal bleeding: results of the BLEED study. J Clin Gastroenterol 2019;53:591-8.
13. Yamada A, Niikura R, Yoshida S, Hirata Y, Koike K. Endoscopic management of colonic diverticular bleeding. Dig Endosc 2015;27:720-5.
14. Cirocchi R, Grassi V, Cavaliere D, Renzi C, Tabola R, Poli G, et al. New trends in acute management of colonic diverticular bleeding: A systematic review. Medicine (Baltimore) 2015;94:e1710.
15. Werner DJ, Manner H, Nguyen-Tat M, Kloeckner R, Kiesslich R, Abusalim N, et al. Endoscopic and angiographic management of lower gastrointestinal bleeding: Review of the published literature. United European Gastroenterol J 2018;6:337-42.
16. Kennedy DW, Laing CJ, Tseng LH, Rosenblum DI, Tamarkin SW. Detection of active gastrointestinal hemorrhage with CT angiography: a 4(1/2)-year retrospective review. J Vasc Interv Radiol 2010;21:848-55.
17. Hong SP. How do I manage post-polypectomy bleeding? Clin Endosc 2012;45:282-4.