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Research Paper

# Etiology of lower gastrointestinal bleeding in Sulaimani governorate-Kurdistan region-Iraq- retrospective cross-sectional study

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ABSTRACT

*Background:* Acute lower gastrointestinal bleeding is arbitrarily defined as bleeding of less than 3 days in duration, while chronic lower gastrointestinal bleeding is the passage of blood from the rectum over a period of several days or longer and usually implies that blood loss is intermittent or slow.
*Objectives:* To find the causes of lower gastrointestinal bleeding and to find the commonest cause to raise awareness of the gastroenterologist personnel, surgeons and internists.
*Patients and methods:* The study was conducted as a retrospective cross-sectional study, 734 patients from a total number of 854 patients, underwent colonoscopy in Kurdistan Center for Gastroenterology and Hepatology in Sulaimani governorate, Kurdistan region-Iraq, were recruited, it took a period of 10 months; from 2nd January 2018 to 31st October in 2018. Clinical examination, digital rectal examination, and colonoscopy with biopsy were arranged for each patient.
*Results:* Bleeding due to hemorrhoid was the most frequent diagnosis (n = 211, 28.74%) which reported during colonoscopy, which was more common in males (n = 113, 15.3%) than females (n = 98, 13.3%) with female to male ratio of (0.86).
*Conclusion:* The most common cause of lower gastrointestinal bleeding in the area is hemorrhoid. Colonoscopy is superior to physical and digital rectal examination in detecting cause of bleeding in lower GIT bleeding.


## 1. Introduction

The gastrointestinal (GI) tract is a highly vascularized organ with a large surface area. Thus any pathology involving the mucosa and the vasculature of the GI tract can lead to GI bleeding [1].

Traditionally, gastrointestinal bleeding (GIB) was classified into upper gastrointestinal bleeding (UGIB) and lower gastrointestinal bleeding (LGIB) [2].

Acute lower gastrointestinal bleeding (ALGIB) is usually defined as overt bleeding from the GI tract distal to the ligament of Treitz leading to hospitalization [3], and is usually suspected when patients present with hematochezia, or maroon stools per rectum [4].

This is different from the clinical presentation of upper gastrointestinal (GI) bleeding, which includes hematemesis [vomiting of blood or coffee ground-like material] and/or melena [black tarry stools] [5].

Patients with hematochezia most frequently bleed from a colonic source. However, when bleeding is brisk, an upper gastrointestinal source of bleeding may present as hematochezia [6].

Approximately 10–15% of patients presenting with acute severe hematochezia have an upper gastrointestinal source of bleeding identified on upper endoscopy [7].

Although most patients with acute LGIB stop bleeding spontaneously and have favorable outcomes [8],

However, for patients with severe hematochezia, defined as continued bleeding within the first 24 h of hospitalization with a drop in the hemoglobin of at least 2 g/dL and/or a transfusion requirement of at least 2 units of packed red blood cells [9].

Acute LGIB is arbitrarily defined as bleeding of fewer than 3 days in duration [10].

Chronic is the passage of blood from the rectum over a period of several days or longer and usually implies that blood loss is intermittent or slow [11].

The definition of chronic lower gastrointestinal bleeding is rather broad, encompassing longstanding or intermittent blood loss of smaller amounts of blood through rectum or melena, but

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also fecal occult blood loss (often not discovered until the patient seeks medical attention for anemia) [12].

Good quality epidemiological studies on LGIB are lacking, but it was recently reported that upper GI bleeding events seem to be decreasing whereas LGIB events seem to be increasing [3], approximately 30–40% of all cases of gastrointestinal bleeding are from a lower gastrointestinal source [13].

Its incidence in the western report is about 20 in 100000 per year [14], which is about one fifth as frequently as upper gastrointestinal bleeding [15].

Identifying the cause of the bleeding may be difficult as most hemorrhages stop spontaneously or the bleeding is intermittent [16], re-bleeding can occur in 25% of cases [17].

LGIB has various causes that can be divided into different groups, these include: anatomic (diverticulosis); vascular (angiodysplasia, ischemic); inflammatory (infectious, idiopathic, and radiation-induced); and neoplastic [18].

Multiple potential etiologies and variable clinical presentations of LGIB present diagnostic and management challenges for clinicians [19].

To find the causes of lower gastrointestinal bleeding and to find the commonest cause to raise awareness of the gastroenterologist personnel, surgeons and internists.

## 2. Patients, materials and method

The work has been reported in line with the STROCSS criteria [20]' and work approved by the Scientific and Ethical Committee of Kurdistan Board for Medical Specialties no.570 on 14 April 2019. Informed consent were signed by the patients and the gastroenterologist, while the consent of the patients below age of 18 years were taken from their parents.

(Approved by Ethics committee of Kurdistan Board of Medical Speciality-surgery)

The study was conducted as a retrospective cross-sectional study, 734 patients from a total number of 854 patients, underwent colonoscopy in Kurdistan Center for Gastroenterology and Hepatology in Sulaimani governorate, Kurdistan region-Iraq, were recruited, it took a period of 10 months; from 2nd January 2018 to 31st October in 2018.

All patients presented with hematochezia, maroon color stool or other patients with melena and normal upper GI endoscopy during the study period were included, detailed history and thorough examination, some blood work like complete blood count (CBC), blood group, renal function test, Serum electrolytes, bleeding profile done for each patient.

A total of 120 patients were excluded, because of any of the followings:

1. Patients from other governorates, who lost in follow up (21 Patients).
2. Incomplete data (36 Patients).
3. Inadequate colonic preparation (31 Patients).
4. Colonoscopy done for causes other than per rectal bleeding, e.g., chronic diarrhea, chronic constipation, screening for high risk individuals, follow up colonoscopy, (32 Patients).

Their Bowel prepared by mechanical preparation:

1. Taking only fluids a day before the colonoscopy.
2. Start Using Coloclean™, each sachet contains: 59 g polyethylene glycol 3350, 5.68 g sodium sulfate anhydrous, 1.68 g sodium bicarbonate, 1.64 g sodium chloride and 0.75 g Potassium chloride.

   One sachet dissolved in 4 glasses of water (1 L), taking 1 glass (250 ml) every 15 min, a total of 8 sachets from 20:00 the day before the procedure.
3. From 6:00 p.m. the day before the procedure Start taking Bisacodyl Tablet 20 mg, 2 tablets every hour, a total of 20 tablets in 10 h.

Lower gastrointestinal tract (GIT) endoscopy with ileal intubation were done Video System Center OLYMPUS CV-V1 and Gastrointestinal Video scope OLYMPUS GIF-LV1 adult (164-cm working length & 13.3-mm outside diameter) and for pediatric patients (133-cm working length & 11.3-mm outside diameter).

The procedure was done under sedation by Midazolam IV injection of (300–400 mcg/kg) of an average time of 15–25 min, During the time of the procedure patients continuously were monitored by the anesthetic team for pulse rate, pulse-oximetry (Spo2) and blood pressure, biopsy was taken from any lesion and sent for histopathological examination.

All the data recorded, organized and analyzed by Statistical Package for the Social Sciences (SPSS) version 21, and p-value considered significant when less than (0.05).

## 3. Results

The major age group presenting as bleeding per rectum and underwent colonoscopy was (30–39) age group, composing 158 patients (21.2%).

The second common group was (60–69) years of age (n = 123, 16.7%), while the least age group patient (n = 17, 02.32%) as those below the age of 10 years, Males were presented more in comparison to females, Female/Male ratio was (0.86) and in the age group (50–59) males and females affected were nearly the same (female = 58, male = 60) patients, with ratio of female/male of (0.96). Gender wise both females and males affected nearly the same number with female/male ratio (0.85).

More than three quarters of the patients (n = 654, 89.1%) were presented as bright blood per rectum and sixty-two patients (8.44%) presented with melena, while minority (n = 18, 2.45%) were complaining of passing maroon stool, the chi-square statistic, p-value was 0.00192 considered as statistically significant, may means that the bright red blood is the major cause of consultation (n = 654, 89.10%).

In half of the patients (n = 376, 51.22%) of the patients both perineal and digital rectal examination were normal, the most common finding was hemorrhoids in 211 (28.74%), while in eighty-three patients (11.3%) bloody stool was found on digital rectal examination, Only sixty-one patients found to have fissure in anus on perineal and peri-anal inspection but digital rectal examination not done in these patients to avoid pain and discomfort to the patients, while minority (n = 3, 0.4%) of patient found to have palpable mass on digital rectal examination.

Hemorrhoids were the most common clinical finding in female patients (n = 98, 09.26%).

Similarly hemorrhoids were the most frequent diagnosis (n = 211, 28.74%) which reported during colonoscopy, with males (n = 113, 15.3%) predominance versus females (n = 98, 13.3%) with female to male ratio of (0.86).

The chi-square statistic, p-value = 0.00765, this small p-value indicates strong evidence against the null hypothesis, which may mean that colonoscopy was superior to clinical examination in detecting causes of lower gastrointestinal bleeding, except for the diagnosis of hemorrhoids both was same (n = 211, 28.74%) significant statistically Table 7, Flow chart 1.

The second and third common causes were polyps (n = 141, 19.2%) and colonic diverticulum (n = 95, 12.9%) respectively. On perineal inspection fissure in ano found in both genders but was

**Table 1**
Age group and gender of the patients underwent colonoscopy for lower gastrointestinal bleeding.

| Age (year) | Total frequency & % | Frequency & % | |
|---|---|---|---|
| | | ♀ | ♂ |
| <10 | 17 | 7 | 10 |
| | 02.32% | 00.95% | 01.36% |
| 10–19 | 33 | 12 | 21 |
| | 04.49% | 01.63% | 02.86% |
| 20–29 | 96 | 50 | 46 |
| | 13.80% | 06.81% | 06.27% |
| 30–39 | 158 | 77 | 81 |
| | 21.52% | 10.49% | 11.03% |
| 40–49 | 121 | 51 | 70 |
| | 16.48% | 06.95% | 09.53% |
| 50–59 | 118 | 58 | 60 |
| | 16.08% | 07.90% | 08.17% |
| 60–69 | 123 | 56 | 67 |
| | 16.75% | 07.63% | 09.12% |
| 70–79 | 46 | 22 | 24 |
| | 06.27% | 02.99% | 03.26% |
| ≥80 | 22 | 7 | 15 |
| | 02.99% | 00.95% | 02.04% |
| Total | 734 | 340 | 394 |
| | 100.00% | 46.63% | 53.37% |

**Table 2**
Main cause of consultation in the patients underwent colonoscopy.

| Variables | Total Frequency & % | Frequency & % | | P value |
|---|---|---|---|---|
| | | ♀ | ♂ | |
| Bright red blood per rectum | 654 | 302 | 352 | 0.00192 |
| | 89.10% | 41.14% | 47.95% | |
| Melena | 62 | 29 | 33 | |
| | 08.44% | 03.95% | 04.49% | |
| Maroon stool | 18 | 9 | 9 | |
| | 02.45% | 01.22% | 01.22% | |
| Total | 734 | 340 | 394 | |
| | 100.00% | 46.32% | 53.67% | |

more common in females (female = 35, 04.76%) and (male = 26, 03.54%) with female/male ratio of (1.34/1). But colonic angiodysplasia (n = 7, 0.95%) was rare finding on colonoscopy examination.

Hemorrhoid found more frequently in age group (50–59) composing 42 patients (19.90%), which in this age group females and male affected were nearly the same (female = 20, male = 22) with a female/male ratio of (0.9) while hemorrhoid not found to be a cause of bleeding per rectum in children below the age of 10 (n = 0).

**Table 3**
Finding of Perineal Examination and Digital Rectal Examination (DRE) in the patients underwent colonoscopy.

| Variables | Frequency & % | Frequency & % | |
|---|---|---|---|
| | | ♀ | ♂ |
| Normal | 376 | 167 | 209 |
| | 51.22% | 22.75% | 28.48% |
| Hemorrhoids | 211 | 98 | 113 |
| | 28.74% | 9.26% | 15.39% |
| Bloody Stool | 83 | 40 | 43 |
| | 11.30% | 05.45% | 05.86% |
| Fissure in anus | 61 | 35 | 26 |
| | 08.31% | 04.76% | 03,54% |
| Palpable mass | 3 | 2 | 1 |
| | 00.40% | 00.27% | 00.13 |
| Total | 734 | 342 | 392 |
| | 100.00% | 46.59% | 53.41% |

**Table 4**
Colonoscopy findings in the patients underwent colonoscopy.

| Variables | Frequency& % | Frequency &% | |
|---|---|---|---|
| | | ♀ | ♂ |
| Hemorrhoid | 211 (28.74%) | 98 (09.26%) | 113 (15.39%) |
| Polyps | | | |
| Total | 141 (19.20%) | 67 (09.12%) | 74 (10.08%) |
| Rectum | 99 (13.48%) | 48 (06.53%) | 51 (06.94%) |
| Colon | 42 (05.72%) | 19 (02.58%) | 23 (03.13) |
| Colonic Diverticulum | 95 (12.94%) | 32 (04.35%) | 63 (08.58%) |
| IBD | | | |
| Total | 86 (11.71%) | 43 (05.85%) | 43 (05.85%) |
| UC | 41 (05.58%) | 18 (02.45%) | 23 (03.13%) |
| CD | 34 (04.63%) | 20 (02.72%) | 14 (01.90%) |
| IC | 11 (01.49%) | 5 (00.68%) | 6 (00.81%) |
| Fissure in ano | 61 (08.31%) | 35 (04.76%) | 26 (03.54%) |
| Normal | 53 (07.22%) | 28 (03.81%) | 25 (03.40%) |
| Cancer | | | |
| Total | 49 (06.67%) | 21 (02.86%) | 28 (03.89%) |
| Rectum | 30 (04.08%) | 13 (01.71%) | 17 (02.32%) |
| Colon | 19 (%) | 8 (01.08%) | 11 (02.31%) |
| Proctitis | 19 (02.58%) | 5 (00.68%) | 14 (01.90%) |
| SRU | 12 (01.63%) | 7 (00.95%) | 5 (00.68%) |
| Colonic Angiodysplasia | 7 (00.95%) | 4 (00.54%) | 3 (00.41%) |
| Total | 734 | 394 | 340 |
| | 100.00% | 53.67% | 46.33% |

**Table 5**
Age Distribution in the commonest pathology (hemorrhoids) in the patients underwent colonoscopy.

| Age (year) | Frequency & % | Frequency &% | |
|---|---|---|---|
| | | ♀ | ♂ |
| <10 | 0 | 0 | 0 |
| | 00.00% | 00.00% | 00.00% |
| 10–19 | 2 | 0 | 2 |
| | 00.27% | 00.00% | 00.27% |
| 20–29 | 12 | 3 | 9 |
| | 01.63% | 00.40% | 01.22% |
| 30–39 | 28 | 13 | 15 |
| | 03.81% | 01.17% | 02.04% |
| 40–49 | 37 | 17 | 20 |
| | 05.04% | 02.37% | 02.72% |
| 50–59 | 42 | 20 | 22 |
| | 19.90% | 02.72% | 02.99% |
| 60–69 | 35 | 16 | 19 |
| | 04,76% | 02.17% | 02.58% |
| 70–79 | 32 | 17 | 15 |
| | 04.35% | 02.31% | 02.04% |
| ≥80 | 23 | 12 | 11 |
| | 03.13% | 01.63% | 01.49% |
| Total | 211 | 98 | 113 |
| | 28.74% | 13.35% | 15.39 |

**Table 6**
Comparing current re4sults with results from literature.

| | Authors | Total number of the patients | Most common cause |
|---|---|---|---|
| A | Alobaidi et al. [5] | 303 | Ulcerative Colitis |
| B | Imtiyaz et al. [11] | 300 | Polyp |
| | | | 88 |
| | | | 29.33% |
| D | Ibrahim et al. [21] | 959 | Hemorrhoid |
| | | | 369 |
| | | | 38.47% |
| E | Jóhann et al. [24] | 163 | Diverticulosis |
| F | Current Study | 734 | Hemorrhoid |
| | | | 211 |
| | | | 28.74% |

**Table 7**
Comparing finding in Perineal Examination and Digital Rectal Examination (DRE) versus colonoscopy finding in the patients.

| Variables | Clinical Examination Frequency & % | Colonoscopy Frequency & % | P value |
|---|---|---|---|
| Normal | 376<br>51.22% | 53<br>07.22% | 0.00765 |
| Hemorrhoids | 211<br>28.74% | 211<br>28.74% | |
| Masses | 3<br>00.40% | 49<br>06.67% | |

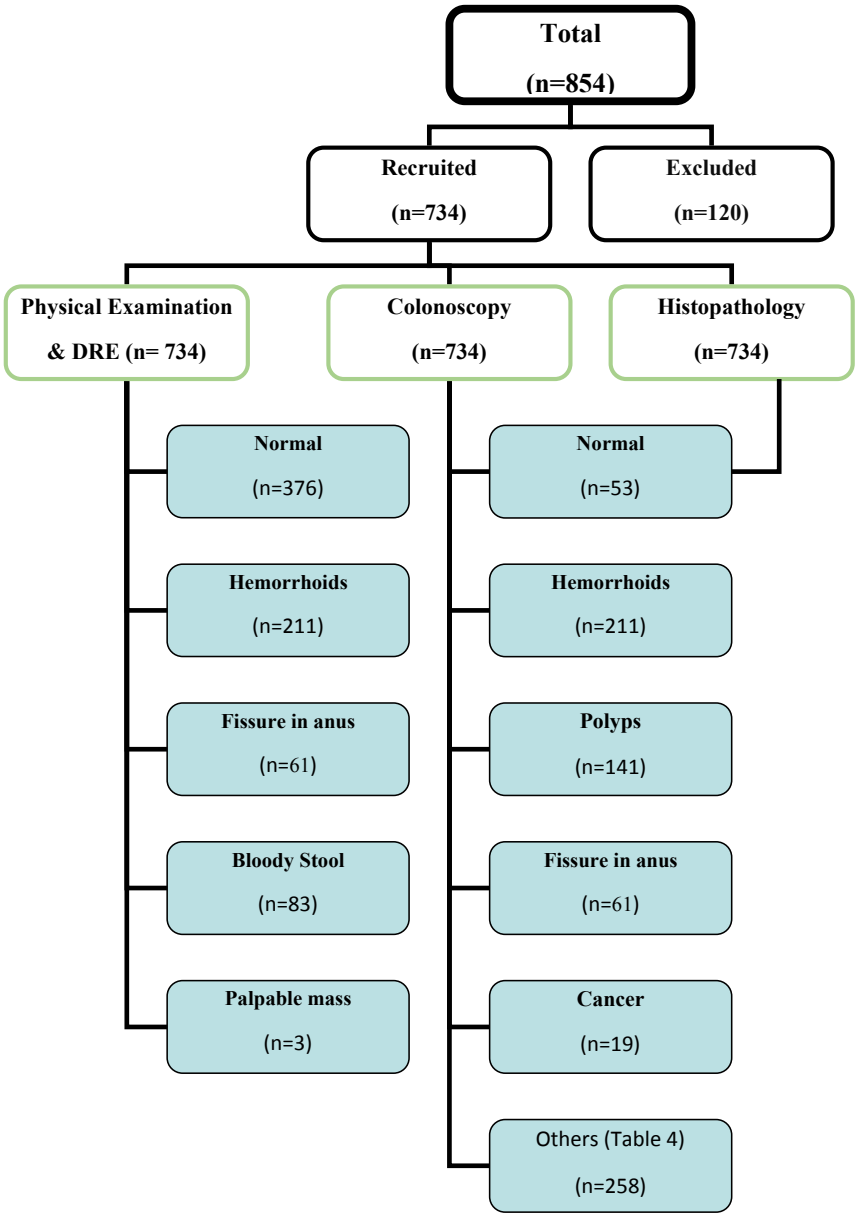
## 4. Discussion

In a study conducted by Imtiyaz et al. [11], Farhan et al. [18], Ibrahim et al. [21], the median age of was (40.8), (46.55), (51.9) years respectively which is parallel to the results in the current study the commonest age groups was (30–39) age (Table 1), and the mean age was (42 ± 9), but not going with Santosh et al., stating that the most common "age group is (18–30) years of age".

Majority of patients (n = 654, 89.1%) presented with bright bleeding per rectum (Table 2) while others: Imtiyaz et al. [11], Qasim et al. [14,15], different prevalence (63.6%), (78%) consequently.

The lines and flow of the management shown in flowchart 1, clearly it showed that colonoscopy was superior to physical examination and DRE; in the diagnosis of the cause of lower GIT bleeding. In physical examination and DRE, was normal half of the patients (n = 376) were normal, and it detected suspected mass only in 3 patients versus colonoscopy and histopathology revealing 49 (06.67%) patients with carcinoma, Table 4.

The major cause of consultation was bright red blood padding per rectum, (n = 654, 89.10%), as shown Table 2, the p-value was 0.00192, considered as statistically significant, this feature is




**Flowchart 1.** The flow of the patients in the work and through different methods of diagnosis.

considered as ominous feature by the population, encourage them to consult a physician, while melena and maroon stool will not frightened most of the inhabitant in the area to consult a physician, there may many patients have these features, they though it is not a feature of disease, but because of types of certain, ignored the melena and maroon.

On clinical examination half of the patients have no any perianal finding (n = 376, 51.22%), while hemorrhoid found in 211 patients who were sent for colonoscopy to exclude secondary hemorrhoid, particularly in the age group (50–59) as seen in Table 5.

In the literature there are few [21–23] articles (on examination finding of perineum and digital rectal examination (DRE) in patients presenting with lower GIT bleeding, albeit they are review articles, not containing information about frequency and prevalence of the findings, the results of present study showed that the most of the patients (n = 376, 51.22%) was normal, Table 3, while (n = 83, 11.30%) of the patients have bloody stool on the examiner's withdrawing finger.

In a study done by Jóhann et al. [24], recruiting 163 patients with lower gastrointestinal bleeding they concluded that "most common cause was diverticulosis (n = 38, 23.31)".

In another study conducted by Imtiyaz et al., [11] on 300 patients the most common causes of lower gastrointestinal bleeding found to be polyps (n = 88, 29.33%), while in a study performed by Alobaidi et al. [5], on nearly the same number of patients stating that "the most common cause of bleeding per rectum found to be ulcerative colitis (n = 95, 31.315%)".

In a large study Ibrahim et al., [21]) on 959 patients presented with bleeding per rectum the commonest cause was" hemorrhoid (n = 369, 38.47%)" is comparable to current work, here hemorrhoid was the most common finding in patients with lower gastrointestinal bleeding (n = 211, 28.74), look to Table 6.

On colonoscopy examination hemorrhoid predominance (n = 211, 28.74%) was observed, which is in accordance with a study conducted by Ibrahim et al., was more prevalence in male with female to male ratio 0.86/1, which is going with other studies [22].

On the other hands other studies stating that the most common cause is either diverticulosis [2], polyp [11] or ulcerative colitis [2,11].

This discrepancy may be explained by the fact that our area is under developed, now it is first step towards developing [26].It is not industrialized, still not westernized in lifestyle and foods, similarly we were agricultural community, changing with invading of the previous regimen in Iraq to non-working community in general [27,28], which makes people had no facility to move, to work, to obtain adequate agricultural products from vegetable and fruits, most of the foods are beans, and non-fresh foods which may lead in constipation, straining and diseases of continued strain like hemorrhoids [25],and different types of hernia.

### 4.1. Strength and limitations

**Strength:**

- The study from developing country with the narrow facility.
- Including physical examination and DRE in the evaluation of the causes of lower GIT bleeding.
- Clinical and endoscopic comparison in the diagnosis of the causes of lower GIT bleeding.

**Limitations:**

- The short period of the study
- The small number of the patients

## 5. Conclusion

The most common cause of lower gastrointestinal bleeding in the area is hemorrhoid. Colonoscopy is superior to physical and digital rectal examination in detecting cause of bleeding in lower GIT bleeding.

## Ethical approval

Approved by Ethics committee of Kurdistan Board of Medical Speciality-surgery no.570 on 14 April 2019.

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## Author contribution

Study concept or design: H. OA., data collection S.A, data analysis or interpretation: H. OA., S.A, writing the paper S.A, final approval: H. OA., S.A.

## Conflict of interest statement

No any conflict of interest to declare.

## Guarantor

Dr. Hiwa Omer Ahmed

## Research registry UIN

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## Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.ijso.2019.07.001.

## References

[1] Zahmatkeshan Mozhgan, Fallahzadeh Ebrahim, Najib Khadijesadat, Geramizadeh Bita, Haghighat Mahmood, Hadi Imanieh Mohammad. Etiology of lower gastrointestinal bleeding in children: a single center experience from Southern Iran. Middle East J Dig Dis October 2012;4(4).
[2] Aoki Tomonori, Hirata Yoshihiro, Yamada Atsuo, Koike Kazuhiko. Initial management for acute lower gastrointestinal bleeding. World J Gastroenterol 2019 January 7;25(1):69–84.
[3] Hreinsson Johann P, Gujmundsson Sveinn, Kalaitzakis Evangelos, Björnsson Einar S. Lower gastrointestinal bleeding: incidence, etiology, and outcomes in a population-based setting. Eur J Gastroenterol Hepatol 2013; 25(1).
[4] Arabi NA, Musaad AM, Mohammed FAH, Ahmed EE, Abdelaziz MSE. Acute lower gastrointestinal bleeding in Sudanese patients: a study on 301 patients in a specialized centre. Arab J Gastroenterol 2018;19:84–7.
[5] Alobaidi QA, Al-shammari AJ, Al- Faham AM. Colonoscopy finding of lower gastrointestinal bleeding (LIGB) in AlSeder medical city (in Al-Najaf)/Iraq. J Pharm Sci & Res 2018;10(4):839–42.
[6] Zuccaro Jr Gregory. Management of the adult patient with acute lower gastrointestinal bleeding. AJG 1998;93(8):1202–8.
[7] Farrell JJ, Friedman LS. Review article: the management of lower gastrointestinal bleeding. Aliment Pharmacol Ther 2005;21:1281–98.

[8] Strate Lisa L, Gralnek Ian M. Management of patients with acute lower gastrointestinal bleeding. Am J Gastroenterol 2016 April;111(4):459–74.
[9] Ghassemi Kevin A, Jensen Dennis M. Lower GI bleeding: epidemiology and management. Curr Gastroenterol Rep 2013 July;15(7).
[10] Jovanović Ivan, Milosavljević Tomica. Endoscopic therapy for lower gastrointestinal bleeding, interventional and therapeutic gastrointestinal endoscopy. Front Gastrointest Res. Basel, Karger 2010;27:240–53.
[11] Dar Imtiyaz Ahmad, Raja Dar Waseem, Khan Mushtaq Ahmad, Kasana Basharat Ahmad, Sofi Najeeb Ullah, Hussain Moomin, et al. Etiology, clinical presentation, diagnosis and management of lower gastrointestinal bleed in a Tertiary Care Hospital in India: a retro-prospective study. J Dig Endosc July–September 2015;6(3). 102102.
[12] Barnert J1, Messmann H. Diagnosis and management of lower gastrointestinal bleeding. Nat Rev Gastroenterol Hepatol 2009 Nov;6(11):637–46. https://doi.org/10.1038/nrgastro.2009.167.
[13] Gralnek Ian M, Neeman Ziv, Strate Lisa L. Acute lower gastrointestinal bleeding. NEJM Org March 16, 2017:1054–63.
[14] Hussein Abdullah Leith A, Ghadhban Jasim Muhsin. Qasim Lefta Abbas, colonoscopy findings in children with lower gastrointestinal bleeding. Iran J Gastroenterol 2011;5(1).
[15] Abbas Qasim L, Asreah Rabah H, Ghadban Basim R. Lower gastrointestinal bleeding: an etiological study. Iraqi JMS July–September 2012;10(3).
[16] Jocić Tatiana, Latinović bošnjak Olgica, Hadnađev Ljiljana. Acute lower gastrointestinal bleeding. Med Pregl 2014;LXVII(11–12):361–6 [Novi Sad: Novembar–Decembar].
[17] Edelman David A, Sugawa Choichi. Lower gastrointestinal bleeding: a review. Surg Endosc 2007;21:514–20.
[18] Khan Farhan, Mushtaq Dareka Khizra, Zhang Qing, Ping Tan Kiao, Pokhrel Suman Mani, Vaidya Rajan. Prevalence and cause of lower gastrointestinal bleeding in adults. IJSIT July–August 2018;7(4).
[19] Weldon DT, Burke SJ, Sun S, Mimura H, Golzarian J. Interventional management of lower gastrointestinal bleeding. Eur Radiol 2008;18:857–67.
[20] Agha RA, Borrelli MR, Vella-Baldacchino M, Thavayogan R, Orgill DP, for the STROCSS Group. The STROCSS statement: strengthening the reporting of cohort studies in surgery. Int J Surg 2017;46:198–202.
[21] Alruzug IM, Aldarsouny TA, Semaan T, AlMustafa A. Lower gastrointestinal bleeding in Saudi patients: a retrospective longitudinal study. J Gastrointest Dig Syst 2016;6:410. https://doi.org/10.4172/2161-069X.1000410.
[22] Cagir Burt, Anand BS. Lower gastrointestinal bleeding clinical presentation, medscape, drugs & diseases > gastroenterology. 2019. Updated: May 06, 2019, https://emedicine.medscape.com/article/188478-clinical-b3.
[23] Zainea George G, Pfenninger John L. Common anorectal conditions: Part I. Symptoms and complaints, the national procedures institute, midland Michigan. Am Fam Physician 2001 Jun 15;63(12):2391–8.
[24] Hreinsson JP, Gumundsson S, Kalaitzakis E, Björnsson ES. Lower gastrointestinal bleeding: incidence, etiology, and outcomes in a population-based setting. Eur J Gastroenterol Hepatol 2013;25(1).
[25] Larkin PJ, Cherny NI, La Carpia D, Guglielmo M, Ostgathe C, Scotte F. Diagnosis, assessment and management of constipation in advanced cancer: ESMO Clinical Practice Guidelines. Ann Oncol October 2018;29(Supplement_4):iv111–25.
[26] Heshmati A, Auzer K. The role of natural resources in Kurdistan regional government's economic development. UKH J Soc Sci 2018, May 31;2(1):1–14.
[27] Hinnebusch Raymond. The US invasion of Iraq: explanations and implications. Critiq Crit Middle E Stud 2007;16(3):209–28. https://doi.org/10.1080/10669920701616443.
[28] Paasche Erlend. Elites and emulators: the evolution of Iraqi Kurdish asylum migration to Europe. Migr Stud 2018. mny036, https://doi.org/10.1093/migration/mny036.