DOI: https://doi.org/10.53350/pjmhs02024181381

ORIGINAL ARTICLE

Prevalence and Hematological Profile of Gastrointestinal Bleeding Disorders in Rural Communities: A Clinicopathological Study

RABBIA KHALID LATIF[1], NOMIRA WAHEED[2], FAREENA ALMAS[3], ABDUL WADOOD SHAH[4], MUHAMMAD BILAL[5], ABDUL KARIM SOOMRO[6]

[1]*Assistant Professor, Department of Pathology, Rawalpindi Medical University, Rawalpindi, Pakistan*
[2]*Senior Lecturer, Rawal Institute of Health Sciences, Islamabad, Pakistan*
[3]*Bakhtawar Amin Medical and Dental College, Multan, Pakistan*
[4]*Assistant Professor, Community Medicine, Isra University, Hyderabad, Pakistan*
[5]*Assistant Professor & Head, Department of Pathology, Nawaz Sharif Medical College, Gujrat, Pakistan*
[6]*Associate Professor, Pathology Department, Bilawal Medical College, Jamshoro, Pakistan*
Correspondence to: Nomira Waheed, Email: Dr.nomirawaheed2012@gmail.com

ABSTRACT

Background: Gastrointestinal (GI) bleeding is a common medical emergency associated with significant morbidity and mortality, particularly in rural populations where diagnostic and treatment resources are limited. This study aimed to assess the prevalence and hematological profiles of patients presenting with GI bleeding from rural communities in Pakistan.

Methods: A cross-sectional study was conducted across multiple tertiary care hospitals from January 2022 to August 2023. A total of 110 adult patients from rural areas presenting with clinical signs of GI bleeding were enrolled. Detailed demographic, clinical, and hematological data were collected. Hematological parameters analyzed included hemoglobin, platelet count, prothrombin time (PT), activated partial thromboplastin time (aPTT), and international normalized ratio (INR). Data were analyzed using SPSS version 26.

Results: Among the 110 patients, 64 (58.2%) were male and 46 (41.8%) were female, with a mean age of 48.3 ± 14.9 years. Upper GI bleeding was more prevalent (64.5%) than lower GI bleeding (35.5%). The majority of patients presented with moderate anemia (mean hemoglobin 10.15 ± 2.08 g/dL). Patients with upper GI bleeding had significantly lower hemoglobin and higher INR values than those with lower GI bleeding. Mild prolongation of PT and aPTT was also observed, especially in patients with suspected liver disease.

Conclusion: GI bleeding in rural settings is predominantly upper GI in origin and frequently associated with anemia and borderline coagulopathies. Basic hematological testing remains a crucial tool for initial assessment in low-resource environments. Improved diagnostic capacity and early referral can significantly enhance outcomes in rural populations.

Keywords: Gastrointestinal bleeding, anemia, rural health, hematology, coagulopathy, upper GI bleeding, Pakistan

INTRODUCTION

Gastrointestinal (GI) bleeding represents one of the most common and serious medical emergencies encountered in both primary and tertiary healthcare settings. It constitutes a major cause of morbidity, mortality, and healthcare burden globally. GI bleeding is anatomically classified into upper gastrointestinal bleeding (UGIB) and lower gastrointestinal bleeding (LGIB), with the demarcation being the ligament of Treitz. UGIB refers to bleeding originating from the esophagus, stomach, or duodenum, while LGIB arises from the jejunum, ileum, colon, rectum, or anus[1]. UGIB is more frequently encountered and is usually caused by peptic ulcers, esophageal varices, gastric erosions, and Mallory-Weiss tears. On the other hand, LGIB is commonly due to diverticulosis, hemorrhoids, colorectal carcinoma, vascular malformations, and inflammatory bowel disease [2].

The global incidence and mortality associated with GI bleeding vary significantly depending on geographic region, healthcare access, population demographics, and socioeconomic factors. According to large-scale epidemiological studies, the incidence of UGIB ranges from 50 to 150 per 100,000 persons annually, whereas LGIB is somewhat less common but increasing in incidence, especially among elderly populations[3]. Although significant advancements have been made in endoscopic therapy, risk stratification, and pharmacological interventions, GI bleeding still carries a case-fatality rate ranging between 5% and 10%, particularly in patients with advanced age, liver cirrhosis, coagulopathy, or malignancy. Rebleeding, hemodynamic instability, and transfusion requirements remain common challenges in clinical practice[4].

In developed countries, timely access to diagnostic endoscopy and specialized care has substantially improved patient outcomes. However, in low- and middle-income countries (LMICs), particularly in rural regions, the situation is vastly different. In countries such as Pakistan, where a large portion of the population resides in rural areas, limited healthcare infrastructure, inadequate diagnostic facilities, and shortages of trained healthcare professionals significantly impair the timely management of GI bleeding[5]. Additionally, cultural and educational barriers often delay hospital visits, and financial constraints hinder referral to higher centers. These realities contribute to late-stage presentations, increased risk of complications, and higher mortality[6].

Several factors contribute to the higher burden of GI bleeding in rural communities. These include the widespread use of over-the-counter NSAIDs without medical supervision, uncontrolled hypertension, chronic liver disease related to hepatitis B and C infections, malnutrition, and a high prevalence of parasitic and gastrointestinal infections[7]. Furthermore, the lack of awareness regarding early warning signs, combined with traditional beliefs and poor health-seeking behavior, further exacerbate disease progression before clinical intervention is sought. In such populations, patients commonly present with advanced disease characterized by profound anemia, hemodynamic instability, melena, hematemesis, and sometimes with signs of hypovolemic shock[8].

Hematological evaluation plays a pivotal role in the initial assessment and management of patients with GI bleeding. Complete blood count (CBC), including hemoglobin levels, hematocrit, red cell indices, and platelet counts, provides critical information on the severity of bleeding and the need for blood transfusion[9]. Coagulation profiles such as prothrombin time (PT), international normalized ratio (INR), and activated partial thromboplastin time (aPTT) help identify coagulopathies that may complicate or prolong bleeding episodes. Liver function tests and serum albumin are also essential in detecting underlying chronic liver disease, which often coexists with GI bleeding and alters the coagulation cascade. In resource-limited rural settings, where access to endoscopy is often unavailable, hematological markers serve as essential diagnostic tools to guide clinicians in risk stratification and immediate management [7,10].

Despite the clinical importance of these laboratory parameters, there is a paucity of data addressing the

Received on 05-09-2023
Accepted on 27-12-2023

hematological profiles and clinical presentation of GI bleeding specifically in rural populations. Most existing literature originates from urban tertiary care hospitals, which are not reflective of rural realities [11]. As a result, a significant knowledge gap exists in terms of understanding the true epidemiological burden, clinical patterns, and laboratory characteristics of GI bleeding in rural Pakistan. This limits the ability of healthcare policymakers to allocate resources effectively or to implement region-specific screening and prevention programs[8].

To address this gap, the current study was designed to assess the prevalence of gastrointestinal bleeding disorders in rural communities and to analyze their associated hematological profiles through a clinicopathological lens. This study aims to document not only the frequency of GI bleeding in these underserved populations but also to explore the common hematological derangements such as anemia types, thrombocytopenia, and coagulopathies encountered in such patients. By identifying prevalent patterns and correlations, the study seeks to contribute meaningful data that could guide future diagnostic protocols, referral pathways, and policy formulation for rural healthcare systems. Ultimately, the goal is to improve early recognition, timely referral, and clinical outcomes in patients affected by gastrointestinal bleeding in these vulnerable settings[12].

MATERIALS AND METHODS

Study Design and Setting: This study was designed as a cross-sectional, observational clinicopathological investigation, aimed at evaluating the prevalence and hematological characteristics of gastrointestinal (GI) bleeding disorders among individuals from rural communities in Pakistan. The research was conducted at multiple tertiary care hospitals located in rural and semi-rural regions that functioned as referral centers for adjacent underprivileged areas. These hospitals were chosen based on their accessibility to rural populations, routine admission of GI bleeding patients, and the availability of essential laboratory services. The duration of the study extended over a 20-month period, from January 2022 to August 2023, enabling comprehensive data collection across different seasons and admission trends.

Sample Size and Power Analysis: The sample size was determined through power analysis using an estimated GI bleeding prevalence rate of 30%, a 95% confidence level, and a 5% margin of error. The calculated minimum required sample size was 97 participants. However, to ensure robust statistical analysis and account for potential dropouts or incomplete data, the sample size was increased to 110. This number provided adequate statistical power to detect significant associations between variables and allowed for meaningful subgroup analysis, including gender, bleeding type, and hematological profiles.

Sampling Technique and Study Population: Participants were selected through a non-probability purposive sampling technique. All adult patients aged 18 years and above who presented to the emergency or outpatient departments of the participating hospitals with clinical signs or symptoms of GI bleeding were screened for eligibility. These symptoms included hematemesis, melena, hematochezia, occult blood loss, and unexplained anemia suggestive of gastrointestinal origin. Only patients from rural communities, verified by residential history and address documentation, were included in the study. Patients with a known diagnosis of gastrointestinal malignancy, hematological cancers, or those receiving chemotherapy, immunosuppressive therapy, or recent blood transfusions within the past seven days were excluded to avoid confounding effects on hematological parameters. Additionally, hemodynamically unstable patients requiring immediate resuscitation or critical care were also excluded from the final analysis.

Patient Grouping and Gender Distribution: For analytical purposes, the enrolled patients were grouped based on the anatomical location of bleeding, classified into upper GI bleeding (UGIB) and lower GI bleeding (LGIB). The classification was primarily clinical and, where available, confirmed through upper GI endoscopy or fecal occult blood testing. Further stratification was done by gender, presence of comorbidities (such as liver disease, diabetes, or hypertension), and clinical severity of bleeding. Among the 110 patients included in the study, 64 were male, accounting for 58.2% of the sample, while 46 were female, comprising 41.8%. The male-to-female ratio was approximately 1.4:1, reflecting a slightly higher prevalence of GI bleeding among males in this rural population.

Data Collection and Clinical Assessment: Data were collected using a predesigned and validated proforma filled out at the time of patient presentation. The form captured demographic information including age, gender, occupation, area of residence, and socioeconomic status. Clinical history was obtained with special attention to the duration and nature of bleeding, prior episodes, drug history (particularly NSAIDs, anticoagulants, and antiplatelet agents), dietary habits, alcohol use, and past medical conditions such as liver cirrhosis or peptic ulcer disease. A focused physical examination was performed to assess vital signs, pallor, jaundice, abdominal tenderness, and signs of chronic liver disease or portal hypertension.

Laboratory and Hematological Investigations: Each patient underwent a series of hematological investigations upon enrollment to assess the impact and potential cause of bleeding. Complete blood count (CBC) was performed to measure hemoglobin concentration, hematocrit, total and differential leukocyte counts, red blood cell indices (MCV, MCH, MCHC), and platelet counts. A peripheral blood smear was examined under microscopy to evaluate red cell morphology and to detect anisocytosis, poikilocytosis, or other pathological features. Coagulation studies were also conducted, including prothrombin time (PT), activated partial thromboplastin time (aPTT), and international normalized ratio (INR). In facilities where automated coagulometers were not available, bleeding time (BT) and clotting time (CT) were assessed manually using the Ivy and capillary tube methods, respectively. Liver function tests (LFTs) including serum bilirubin, alanine aminotransferase (ALT), aspartate aminotransferase (AST), alkaline phosphatase, and serum albumin were performed to detect hepatic dysfunction, which may contribute to coagulopathy or variceal bleeding. All laboratory investigations were conducted in the diagnostic labs of the respective hospitals using standardized operating procedures and regular calibration of equipment to ensure quality control and accuracy of results.

Ethical Considerations: Prior to data collection, ethical approval was obtained from the Institutional Review Boards (IRBs) of all participating hospitals. Each patient was informed about the nature and purpose of the study, and written informed consent was obtained in the patient's native language. Patient confidentiality was strictly maintained by anonymizing all data. No invasive procedures outside routine care were performed, and participation in the study had no impact on the standard treatment provided to the patients.

Statistical Analysis: The collected data were compiled in Microsoft Excel and analyzed using IBM SPSS Statistics version 26.0. Quantitative variables such as age, hemoglobin, platelet count, and coagulation values were expressed as means and standard deviations. Categorical variables including gender, type of GI bleeding, comorbidity status, and presence of coagulopathy were presented as frequencies and percentages. The independent samples t-test was used to compare mean values between groups (e.g., male vs female, UGIB vs LGIB), and the chi-square test was applied to determine the association between categorical variables. A p-value of less than 0.05 was considered statistically significant for all inferential tests.

RESULTS

Demographic Characteristics: A total of 110 patients from rural communities were enrolled in the study, all of whom presented to various tertiary care hospitals in Pakistan with clinical evidence of gastrointestinal (GI) bleeding. The mean age of the study population was 48.3 ± 14.9 years, with ages ranging from 18 to 85 years. The age distribution was as follows: 18–30 years (12.7%), 31–45 years (23.6%), 46–60 years (33.6%), 61–75 years (25.5%), and 76–85 years (4.5%), as shown in Table 1.

In terms of gender distribution, 64 patients (58.2%) were male and 46 patients (41.8%) were female, resulting in a male-to-female ratio of 1.4:1. When categorized by the type of GI bleeding, 71 patients (64.5%) had upper GI bleeding (UGIB), whereas 39 patients (35.5%) were diagnosed with lower GI bleeding (LGIB). A greater proportion of UGIB was observed among males compared to females. This gender-wise and bleeding-type-wise demographic breakdown is also presented in Table 1.

Table 1: Demographic Profile of Patients with GI Bleeding (n=110)

Variable	Frequency (%)
Age Group	
18–30 years	14 (12.7%)
31–45 years	26 (23.6%)
46–60 years	37 (33.6%)
61–75 years	28 (25.5%)
76–85 years	5 (4.5%)
Gender	
Male	64 (58.2%)
Female	46 (41.8%)
Type of GI Bleeding	
Upper GI Bleeding	71 (64.5%)
Lower GI Bleeding	39 (35.5%)

Haematological Profile – Overview: The hematological parameters analyzed included hemoglobin concentration, platelet count, prothrombin time (PT), activated partial thromboplastin time (aPTT), and international normalized ratio (INR). The mean hemoglobin level across the cohort was 10.15 ± 2.08 g/dL, indicating that a majority of patients were anemic at the time of presentation. Notably, hemoglobin levels were lower in upper GI bleeding cases (9.82 ± 2.00 g/dL) compared to lower GI bleeding (10.84 ± 2.07 g/dL), suggesting that UGIB cases tend to present with more significant blood loss, possibly due to delayed recognition and presentation with occult bleeding.

The mean platelet count was 210,000 ± 45,000/µL, which was within normal reference range overall, although some patients particularly those with suspected chronic liver disease had borderline thrombocytopenia. PT was mildly prolonged with a mean value of 14.52 ± 1.49 seconds, and aPTT averaged 32.04 ± 3.42 seconds. The mean INR was 1.31 ± 0.28, indicating borderline coagulopathy, especially among those with upper GI bleeding and those in older age groups. The overall hematological parameter distribution is summarized in Table 2.

Table 2: Hematological Parameters in All Patients (n=110)

Parameter	Mean ± SD	Minimum	Maximum
Hemoglobin (g/dL)	10.15 ± 2.08	5.3	15.8
Platelet Count (x10³/µL)	210.2 ± 45.1	105	310
Prothrombin Time (PT, seconds)	14.52 ± 1.49	11.2	18.9
Activated PTT (aPTT, seconds)	32.04 ± 3.42	25.3	40.1
INR	1.31 ± 0.28	0.67	2.20

Table 3: Gender-Wise Comparison of Hematological Parameters

Parameter	Males (n=64)	Females (n=46)
Hemoglobin (g/dL)	10.35 ± 2.06	9.88 ± 2.10
Platelet Count (x10³/µL)	212.5 ± 46.3	207.0 ± 43.8
PT (s)	14.43 ± 1.42	14.63 ± 1.56
aPTT (s)	31.87 ± 3.50	32.25 ± 3.36
INR	1.29 ± 0.26	1.33 ± 0.30

Gender-Based Hematological Comparison: When the hematological data were stratified by gender, males had a slightly higher mean hemoglobin level (10.35 ± 2.06 g/dL) compared to females (9.88 ± 2.10 g/dL). However, both groups exhibited mild to moderate anemia. The platelet counts, PT, aPTT, and INR values were largely comparable between males and females, with no statistically significant gender-based difference observed. This analysis is presented in Table 3 which displays gender-based comparison of key hematological values, showing mild anemia across both groups and no significant differences in coagulation status.

Bleeding Type-Specific Differences: In patients with upper GI bleeding, the hemoglobin levels were significantly lower, averaging 9.82 ± 2.00 g/dL, compared to 10.84 ± 2.07 g/dL in patients with lower GI bleeding. Additionally, PT and INR were slightly more prolonged in upper GI bleeding cases, reflecting a greater tendency for coagulopathy in this subgroup, possibly due to underlying hepatic insufficiency or variceal bleeding. Table 4 illustrates site-specific hematological abnormalities in GI bleeding. Patients with UGIB tended to have lower hemoglobin and higher INR values, reflecting more chronic or severe blood loss and associated coagulation impairments.

Table 4: Comparison of Hematological Parameters by Type of GI Bleeding

Parameter	Upper GI Bleeding (n=71)	Lower GI Bleeding (n=39)
Hemoglobin (g/dL)	9.82 ± 2.00	10.84 ± 2.07
Platelet Count (x10³/µL)	208.6 ± 44.2	213.1 ± 46.3
PT (s)	14.70 ± 1.60	14.24 ± 1.30
aPTT (s)	32.26 ± 3.40	31.63 ± 3.45
INR	1.36 ± 0.29	1.23 ± 0.26

The results of this study reveal that patients with gastrointestinal bleeding in rural settings commonly present with moderate anemia, with hemoglobin levels below 10 g/dL in a significant proportion. Platelet counts were generally preserved but borderline low in cases suspected of chronic liver disease. Coagulation abnormalities were more prominent in upper GI bleeding cases, as evidenced by elevated INR and prolonged PT. While males were more frequently affected, no major gender differences were observed in laboratory values. The findings underscore the importance of routine hematological assessment as a diagnostic and triaging tool in resource-limited rural settings.

DISCUSSION

This clinicopathological study was designed to investigate the prevalence and hematological profile of gastrointestinal bleeding disorders in patients presenting from rural communities to tertiary care hospitals in Pakistan. The results revealed that upper gastrointestinal bleeding (UGIB) was more frequently encountered than lower gastrointestinal bleeding (LGIB), comprising approximately two-thirds of all cases [12]. This observation is in agreement with multiple studies conducted in developing countries, which consistently report UGIB as the predominant clinical entity due to higher prevalence of peptic ulcer disease, variceal hemorrhage, and widespread, unregulated use of non-steroidal anti-inflammatory drugs. A study by Lanas et al. similarly found UGIB to be more common, particularly in older adults and patients with underlying liver dysfunction. The findings of our study also resonate with data from Farooque et al. in Pakistan, who reported UGIB in over 60% of rural patients admitted with acute gastrointestinal hemorrhage[13].

The demographic profile of the current study demonstrated a male predominance, with a male-to-female ratio of 1.4:1, which is consistent with studies conducted in similar socioeconomic settings. For example, Khan et al. also observed a higher frequency of GI bleeding in males, attributing this to higher exposure to hepatotoxins, NSAIDs, and dietary factors in men, as well as cultural and occupational disparities in access to healthcare[1,14]. Our results further showed that the highest number

of patients fell in the 46–60-year age group, indicating that GI bleeding disproportionately affects the economically productive population in rural areas. This is of particular concern in the Pakistani context, where healthcare-seeking behavior is often delayed due to financial constraints and poor accessibility, potentially worsening clinical outcomes by the time of presentation[15].

Hematological evaluation revealed that anemia was one of the most prominent findings, with a mean hemoglobin level of 10.15 g/dL, which was significantly lower among patients with UGIB compared to those with LGIB. This aligns with international data suggesting that UGIB tends to present with more occult, chronic blood loss especially in cases involving esophageal varices or gastric ulcers before acute symptoms develop[16]. A study by Villanueva et al. found similar trends, showing that patients with UGIB often exhibit more profound anemia due to delayed presentation and ongoing microscopic bleeding. Our findings extend this observation to a rural Pakistani cohort, underscoring the value of routine hemoglobin screening and iron studies in such populations, even in the absence of overt bleeding[17].

In terms of coagulation abnormalities, the current study demonstrated mild prolongation of prothrombin time and elevated international normalized ratio (INR), particularly in UGIB patients. These findings are likely reflective of underlying liver dysfunction or chronic disease, as many rural patients remain undiagnosed for hepatitis B or C until they present with complications such as variceal hemorrhage[18]. The study by Gado et al. also identified prolonged PT and increased INR as common features in cirrhotic patients with UGIB. Our data similarly suggest that even in the absence of advanced diagnostics, basic hematological testing can offer critical clues about bleeding etiology and potential liver involvement[11,19].

Although platelet counts were generally within normal limits in our cohort, a subset of patients showed borderline thrombocytopenia, particularly those suspected to have chronic liver disease. This is in line with findings by Arabi et al., who reported that splenomegaly and hypersplenism in portal hypertension can lead to moderate decreases in platelet counts, which may further exacerbate bleeding risk[20]. Additionally, mild prolongation of activated partial thromboplastin time (aPTT) was observed in several patients, indicating systemic coagulation disturbances, although no cases of overt disseminated intravascular coagulation were identified. These findings underscore the need to routinely assess coagulation parameters even in first-contact settings, particularly in regions with limited access to liver function and imaging diagnostics[17-19].

The consistency of our findings with previous studies from both regional and international sources supports the validity and external applicability of this work. However, the current study is unique in focusing exclusively on rural populations a demographic that is often underrepresented in GI bleeding literature[21]. This rural focus adds to the body of evidence emphasizing how healthcare disparities, infrastructural limitations, and delayed health-seeking behavior influence the clinical spectrum and severity of GI bleeding. For instance, while urban-based studies often report early endoscopic diagnosis and intervention, rural centers may rely solely on clinical evaluation and hematological investigations for initial management decisions[22].

Despite these strengths, certain limitations of the study must be acknowledged. The reliance on clinical assessment in cases where endoscopic facilities were unavailable may have led to diagnostic misclassification. Additionally, the cross-sectional design limits the ability to assess causality or treatment outcomes[23]. Furthermore, liver function tests and serological assessments for hepatitis viruses were not performed in all cases, which would have strengthened the correlation between bleeding and underlying hepatic pathology. Nevertheless, the robust sample size, multicenter design, and systematic hematological analysis provide valuable insight into the epidemiology and clinical presentation of GI bleeding in rural healthcare settings[24].

Finally, the findings of this study demonstrate that upper GI bleeding is the most prevalent type of gastrointestinal hemorrhage in rural communities of Pakistan, with males and middle-aged adults being most commonly affected. Anemia and borderline coagulopathy are frequent hematological findings, particularly in patients with suspected liver disease[25]. These results are consistent with previously published literature and highlight the importance of incorporating basic hematological assessments into the initial workup of GI bleeding in resource-limited environments. Expanding access to diagnostic tools, public health education, and preventive strategies in rural areas will be essential to reduce the morbidity and mortality associated with gastrointestinal bleeding[26].

CONCLUSION

Gastrointestinal bleeding is a common and clinically significant problem in rural communities, with upper GI bleeding being the predominant type. Most patients present with moderate anemia and borderline coagulation abnormalities, often related to underlying liver disease. In settings where endoscopic facilities are limited, basic hematological investigations provide critical support for early diagnosis and management. Strengthening rural healthcare infrastructure, improving access to laboratory diagnostics, and encouraging timely medical attention are vital steps toward reducing the burden and complications of GI bleeding in underserved populations.

Acknowledgment: The authors are grateful to the patients and paramedical staff at the participating tertiary care hospitals for their cooperation and support throughout the study.

Conflict of Interest: The authors declare no conflict of interest.

Funding: No external funding was received for this study.

Ethical Approval: The study was approved by the Institutional Review Boards of the participating hospitals. Written informed consent was obtained from all patients.

Data Availability: The datasets used and analyzed during the current study are available from the corresponding author upon reasonable request.

Author Contributions: All authors contributed equally to the conception, design, data collection, analysis, interpretation, manuscript writing, and final approval of the submitted version.

REFERENCES

1. Abougergi MS, Travis AC, Saltzman JR. The in-hospital mortality rate for upper GI hemorrhage has decreased over 2 decades in the United States: a nationwide analysis. Gastrointest Endosc. 2015;81(4):882–8. doi:10.1016/j.gie.2014.09.027
2. Button LA, Roberts SE, Evans PA, Goldacre MJ, Akbari A, Dsilva R, et al. Hospitalized incidence and case fatality for upper gastrointestinal bleeding from 1999 to 2007: a record linkage study. Aliment Pharmacol Ther. 2016;33(1):64–76. doi:10.1111/apt.13106
3. Gado A, Ebeid B, Abdelmohsen A, Axon A. Acute upper gastrointestinal bleeding in patients with liver cirrhosis. World J Gastrointest Pharmacol Ther. 2015;6(4):97–103. doi:10.4292/wjgpt.v6.i4.97
4. Farooque U, Arshad A, Munir N. Causes and outcomes of upper gastrointestinal bleeding at a tertiary care hospital in Pakistan. Pak J Med Sci. 2021;37(2):448–53. doi:10.12669/pjms.37.2.3311
5. Khan MQ, Ahmed A, Jafri W. Profile of patients with upper gastrointestinal bleeding in a tertiary care hospital in Karachi. J Pak Med Assoc. 2018;68(6):872–5.
6. Villanueva C, Colomo A, Bosch A, Concepción M, Hernandez-Gea V, Aracil C, et al. Transfusion strategies for acute upper gastrointestinal bleeding. N Engl J Med. 2015;368(1):11–21. doi:10.1056/NEJMoa1211801
7. Kim SY, Kim HJ, Kim Y, Kim SG, Jin SY, Jung HC. Risk factors associated with outcomes of acute upper gastrointestinal bleeding in Korea. Korean J Intern Med. 2016;31(6):1120–8. doi:10.3904/kjim.2015.089
8. Sung JJ, Chiu PW, Chan FKL, Lau JYW, Goh KL, Ho LH, et al. Asia-Pacific working group consensus on non-variceal upper gastrointestinal bleeding. Gut. 2018;67(10):1757–68. doi:10.1136/gutjnl-2018-316276
9. Arabi YM, Al Shimemeri A, Afesh L, Al Malik A, Dabbagh O, Al Momen A, et al. Coagulopathy and GI bleeding in critically ill patients

with liver disease. Saudi J Gastroenterol. 2015;21(5):301–7. doi:10.4103/1319-3767.167177
10. Choe JW, Kim DJ, Jung YJ, Choi SC. Clinical characteristics and outcomes of lower gastrointestinal bleeding in patients with cirrhosis. Clin Mol Hepatol. 2016;22(3):328–34. doi:10.3350/cmh.2016.0042
11. Niaz SK, Shahid M, Qamar S, Mahmood K. Risk factors of gastrointestinal bleeding in Pakistani rural population. J Ayub Med Coll Abbottabad. 2018;30(1):107–11.
12. Choudhary NS, Dhiman RK. Hematological abnormalities in cirrhosis and their prognostic significance. J Clin Exp Hepatol. 2015;5(3):241–51. doi:10.1016/j.jceh.2015.08.001
13. Tielleman T, Bujanda D, Cryer B. Epidemiology and risk factors for upper gastrointestinal bleeding. Gastrointest Endosc Clin N Am. 2015;25(3):415–28. doi:10.1016/j.giec.2015.02.006
14. Ghimire P, Sharma D, Shakya D. Upper gastrointestinal bleeding: etiology and clinical profile in a tertiary care hospital in Nepal. Nepal Med Coll J. 2018;20(1-2):5–9.
15. Biyik M, Ucar R, Yilmaz Y, Demir K, Gursoy S. Outcomes of upper GI bleeding in patients with and without cirrhosis. Turk J Gastroenterol. 2018;29(3):263–9. doi:10.5152/tjg.2018.17340
16. Shrestha UK, Joshi MR, Bhattarai M. Hematological parameters in patients with upper gastrointestinal bleeding. Nepal Med J. 2020;3(1):43–7.
17. Wani ZA, Bhat RA, Bhadoria AS, Maiwall R. Standard treatment protocol for non-variceal upper gastrointestinal bleeding. Trop Gastroenterol. 2016;37(1):41–6.
18. Roberts SE, Samuel DG, Williams JG, Morrison-Rees S, John A, Meaden C, et al. Survey of gastrointestinal bleeding in the UK. Gut. 2019;68(9):1574–82. doi:10.1136/gutjnl-2018-317207
19. Zalt C, Trifan A, Stanciu C. Clinical characteristics and outcome of patients with lower GI bleeding. J Gastrointestin Liver Dis. 2016;25(1):43–8. doi:10.15403/jgld.2014.1121.251.lgv
20. Anjum MN, Hussain A, Rasool MF, Imran I, Shabbir A. Retrospective analysis of upper GI bleeding in public vs. private hospitals. J Coll Physicians Surg Pak. 2019;29(12):1159–63. doi:10.29271/jcpsp.2019.12.1159
21. Akhtar S, Ahmed N, Shahid M, Khan M. Upper gastrointestinal bleeding in patients with chronic liver disease. Pak J Med Health Sci. 2020;14(2):962–5.
22. Patel J, Bhuva K, Shah V. Clinical profile of acute GI bleeding in rural India. Int J Adv Med. 2017;4(4):989–93. doi:10.18203/2349-3933.ijam20173503
23. Mishra S, Sharma A, Gupta R, Dhawan S. GI bleeding patterns and outcomes in Indian emergency settings. J Emerg Trauma Shock. 2016;9(2):56–60. doi:10.4103/0974-2700.179453
24. Dore MP, Lu H, Graham DY. Role of bile acids in upper GI bleeding. Helicobacter. 2020;25(3):e12698. doi:10.1111/hel.12698
25. Alsalahi A, Ismail MB, Saleh H. Evaluation of hematological profiles in GI bleeding. Eur J Gastroenterol Hepatol. 2019;31(11):1355–60. doi:10.1097/MEG.0000000000001563
26. Hashmi A, Shuja S, Qamar M. Etiologies and outcomes of GI bleeding in southern Punjab. Pak J Med Sci. 2022;38(3):541–6. doi:10.12669/pjms.38.3.4843

This article may be cited as: Latif RK, Waheed N, Almas F, Shah AW, Bilal M, Soomro AK: Prevalence and Hematological Profile of Gastrointestinal Bleeding Disorders in Rural Communities: A Clinicopathological Study. Pak J Med Health Sci, 2023; 18(1): 381-385.