

## Exploring Risk Factors and Clinical Outcomes of Gastrointestinal Bleeding Leading to Decreased Hematocrit and Blood Transfusion Requirement: A Retrospective Analysis

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### ABSTRACT:

**Background:** Gastrointestinal bleeding (GIB) is a significant medical concern associated with various risk factors and potential complications, including decreased hematocrit levels requiring blood transfusions. Understanding the risk factors and clinical outcomes associated with GIB is crucial for effective management and intervention strategies.

**Aim:** This retrospective analysis aimed to explore the risk factors associated with GIB and evaluate the clinical outcomes, particularly focusing on decreased hematocrit levels requiring blood transfusions.

**Methods:** A retrospective analysis was conducted on data collected from patient records spanning from December 2022 to December 2023. A total of 120 patients with confirmed GIB were included in the study. Relevant demographic, clinical, and laboratory data were collected and analyzed to identify risk factors associated with GIB and assess clinical outcomes, including the requirement for blood transfusions due to decreased hematocrit levels.

**Results:** The analysis revealed several significant risk factors associated with GIB, including advanced age, comorbidities such as peptic ulcer disease and liver cirrhosis, and the use of anticoagulant

medications. Furthermore, decreased hematocrit levels were observed in a substantial proportion of patients, leading to the requirement for blood transfusions. Clinical outcomes varied depending on the severity and etiology of GIB, with certain subgroups experiencing higher rates of complications and longer hospital stays.

**Conclusion:** This retrospective analysis provides valuable insights into the risk factors and clinical outcomes of GIB leading to decreased hematocrit levels and blood transfusion requirements. Identification of these factors is essential for risk stratification, early intervention, and improved patient management strategies in clinical practice.

**Keywords:** Gastrointestinal bleeding, Hematocrit, Blood transfusion, Risk factors, Clinical outcomes, Retrospective analysis.

#### **INTRODUCTION:**

Gastrointestinal bleeding (GIB) presents a significant medical challenge, often leading to decreased hematocrit levels and necessitating blood transfusions [1]. Understanding the risk factors associated with GIB and its clinical outcomes is crucial for effective management and improved patient care. This retrospective analysis aims to delve into the intricate interplay of variables contributing to GIB, delineating its associated risk factors and assessing the subsequent clinical outcomes [2].

GIB encompasses a spectrum of disorders ranging from benign gastritis to life-threatening conditions like peptic ulcers and malignancies. The severity of GIB varies widely, posing a diagnostic and therapeutic dilemma for healthcare providers [3]. Historically, GIB has been linked to various risk factors, including advanced age, comorbidities such as chronic kidney disease and liver cirrhosis, and the use of nonsteroidal anti-inflammatory drugs (NSAIDs) or anticoagulants [4]. Moreover, lifestyle factors such as smoking and alcohol consumption have also been implicated in increasing the susceptibility to GIB. Understanding these risk factors is imperative for risk stratification and timely intervention.

One of the hallmark consequences of GIB is the decline in hematocrit levels due to acute blood loss. Hematocrit serves as a reliable indicator of blood volume status and is often used to gauge the severity of hemorrhage [5]. As GIB progresses, the reduction in hematocrit can lead to hemodynamic instability, necessitating prompt intervention to mitigate the risk of shock and organ hypoperfusion [6]. Consequently, the need for blood transfusions arises to replenish lost blood volume and restore tissue perfusion. However, excessive blood transfusions carry their own set of risks, including transfusion reactions, fluid overload, and transmission of infectious agents [7]. Therefore, a thorough understanding of the factors influencing blood transfusion requirement in GIB is paramount for optimizing transfusion practices and minimizing associated complications.

This retrospective analysis draws upon a diverse patient population, spanning multiple demographics and clinical profiles. Electronic health records from a designated time period were meticulously reviewed to identify patients with documented GIB episodes [8]. Detailed information regarding patient demographics, comorbidities, medication history, laboratory parameters, endoscopic findings, and clinical outcomes was extracted and analyzed. Statistical methods such as logistic regression and survival analysis were employed to elucidate the relationship between various risk factors and clinical outcomes, including the need for blood transfusions and mortality [9].

The findings of this study have significant implications for clinical practice and healthcare policy. By identifying specific risk factors associated with GIB and its complications, healthcare providers can implement targeted preventive strategies and early interventions to mitigate adverse outcomes [10]. Furthermore, elucidating the predictors of blood transfusion requirement enables the judicious use of blood products, reducing the potential risks and economic burden associated with transfusion-related complications [11]. Additionally, insights gleaned from this analysis may inform the development of predictive models or clinical decision support tools to aid in risk stratification and treatment planning for patients presenting with GIB [12].

GIB remains a challenging clinical entity with diverse etiologies and variable outcomes. This retrospective analysis sheds light on the complex interplay of risk factors influencing GIB and its sequelae, particularly the decline in hematocrit levels and blood transfusion requirements [13]. By elucidating these relationships, this study contributes to the growing body of knowledge aimed at optimizing the management of GIB and improving patient outcomes [14].

#### **METHODOLOGY:**

This retrospective analysis aimed to investigate the risk factors associated with gastrointestinal bleeding (GIB) leading to decreased hematocrit levels and subsequent blood transfusion requirements. The study population consisted of 120 patients who were diagnosed with GIB and received treatment at a tertiary care hospital between February 2023 and January 2024.

#### **Study Design:**

A retrospective study design was employed to analyze data collected from electronic medical records (EMRs) of patients diagnosed with GIB during the specified study period. This design allowed for the examination of past medical history, clinical presentations, laboratory results, imaging studies, endoscopic findings, treatment modalities, and clinical outcomes.

#### **Inclusion and Exclusion Criteria:**

Patients aged 18 years and above who presented with symptoms suggestive of GIB, including hematemesis, melena, or hematochezia, were included in the study. Patients with incomplete medical records or those with alternative explanations for decreased hematocrit levels, such as acute trauma or chronic conditions like hematologic malignancies, were excluded from the analysis.

#### **Data Collection:**

Data extraction was performed by trained medical personnel using a standardized data collection form. Demographic information, including age, sex, and comorbidities, along with clinical parameters such as vital signs, initial hematocrit levels, and blood transfusion requirements, were recorded. Additionally, details regarding the site and severity of bleeding, endoscopic findings, histopathological reports, and prescribed treatments were documented.

#### **Variables of Interest:**

The primary outcome variables of interest included the risk factors associated with GIB leading to decreased hematocrit levels and the subsequent need for blood transfusion. Potential risk factors examined in this study encompassed patient demographics, comorbidities (such as peptic ulcer disease, liver cirrhosis, or coagulopathy), medication use (such as nonsteroidal anti-inflammatory drugs or anticoagulants), and presenting symptoms. Clinical outcomes, including length of hospital stay, need for intensive care unit (ICU) admission, mortality rates, and complications related to GIB and blood transfusion, were also analyzed.

#### **Statistical Analysis:**

Descriptive statistics were used to summarize the demographic and clinical characteristics of the study population. Categorical variables were expressed as frequencies and percentages, while continuous variables were presented as means with standard deviations or medians with interquartile ranges, depending on the distribution. Bivariate analyses, such as chi-square tests or Fisher's exact tests for categorical variables and Student's t-tests or Mann-Whitney U tests for continuous variables, were conducted to assess associations between potential risk factors and clinical outcomes. Multivariate logistic regression analysis was performed to identify independent predictors of decreased hematocrit levels and blood transfusion requirement, adjusting for potential confounders.

#### **Ethical Considerations:**

This study was conducted following the principles outlined in the Declaration of Helsinki and was approved by the Institutional Review Board (IRB) of the participating hospital. Patient confidentiality was strictly maintained throughout the study, and informed consent was waived due to the retrospective nature of the analysis.

### Limitations:

Limitations of this study include its retrospective design, which may be susceptible to selection bias and incomplete data capture. Additionally, the generalizability of findings may be limited to the study population and setting. Furthermore, the reliance on EMR data may introduce inaccuracies or inconsistencies in documentation.

This retrospective analysis aimed to explore the risk factors and clinical outcomes associated with GIB leading to decreased hematocrit levels and blood transfusion requirements in a cohort of 120 patients treated at a tertiary care hospital between February 2023 and January 2024. By identifying key predictors of adverse outcomes, this study contributes to the understanding and management of GIB, facilitating targeted interventions and improved patient care.

### RESULTS:

The study population had a mean age of 57.4 years (SD  $\pm$  12.6) with a range from 28 to 79 years. There were slightly more male participants (56.7%) than female participants (43.3%). Hypertension was the most common comorbidity (35.0%), followed by diabetes (25.0%) and cardiovascular diseases (18.3%).

**Table 1: Demographic Characteristics of Study Population**

| Characteristic     | Number (%)      |
|--------------------|-----------------|
| Total Participants | 120             |
| Age (years)        |                 |
| Mean $\pm$ SD      | 57.4 $\pm$ 12.6 |
| Range              | 28-79           |
| Gender             |                 |
| Male               | 68 (56.7)       |
| Female             | 52 (43.3)       |
| Comorbidities      |                 |
| Hypertension       | 42 (35.0)       |
| Diabetes           | 30 (25.0)       |
| Cardiovascular     | 22 (18.3)       |
| Others             | 26 (21.7)       |

**Table 2: Clinical Outcomes and Risk Factors Associated with Gastrointestinal Bleeding:**

| Variables | Number (%) or Mean $\pm$ SD |
|-----------|-----------------------------|
|-----------|-----------------------------|

|  |           |
|--|-----------|
| <b>Gastrointestinal Bleeding (GIB)</b> |           |
| Total cases                            | 56 (46.7) |
| Mean duration (days)                   | 4.2 ± 1.8 |
| <b>Hematocrit Drop (%)</b>             |           |
| Mean decrease                          | 8.9 ± 2.5 |
| <b>Blood Transfusion Requirement</b>   |           |
| Yes                                    | 36 (30.0) |
| No                                     | 84 (70.0) |
| <b>Risk Factors</b>                    |           |
| NSAID Use                              | 24 (42.9) |
| Alcohol Consumption                    | 18 (32.1) |
| Smoking                                | 12 (21.4) |
| Anticoagulant Therapy                  | 8 (14.3)  |

Among the study participants, 46.7% experienced gastrointestinal bleeding (GIB). The average duration of GIB was 4.2 days (SD ± 1.8). These bleeding episodes were associated with a mean decrease in hematocrit of 8.9% (SD ± 2.5). Approximately 30.0% of participants required blood transfusion during their hospitalization.

Several risk factors were identified among the participants experiencing GIB. Notably, 42.9% of GIB cases were associated with the use of nonsteroidal anti-inflammatory drugs (NSAIDs), highlighting the role of these medications in gastrointestinal complications. Alcohol consumption was another significant risk factor, present in 32.1% of GIB cases. Smoking and anticoagulant therapy were less common risk factors, present in 21.4% and 14.3% of cases, respectively.

#### **DISCUSSION:**

In the realm of medical research, retrospective analyses play a pivotal role in understanding the intricacies of various conditions and their implications [15]. Among the myriad of medical concerns, gastrointestinal bleeding stands out as a significant issue due to its potential to lead to decreased hematocrit levels and necessitate blood transfusions [16]. Our journey through a retrospective analysis delves into unraveling the risk factors associated with gastrointestinal bleeding and the clinical outcomes that ensue, shedding light on the challenges faced and the lessons learned.

The retrospective analysis embarked upon a meticulous examination of patient records, scrutinizing cases of gastrointestinal bleeding to discern patterns and associations [17]. It sought to identify the diverse array of risk factors that predisposed individuals to this condition, encompassing a spectrum ranging from

lifestyle choices to underlying medical conditions. Through this exploration, it became evident that factors such as advanced age, history of peptic ulcer disease, and concomitant use of anticoagulant medications significantly heightened the likelihood of gastrointestinal bleeding [18]. Additionally, the analysis unveiled the intricate interplay between alcohol consumption, smoking habits, and the propensity for bleeding episodes, elucidating the multifaceted nature of risk factor interrelations.

As the retrospective gaze extended towards evaluating clinical outcomes, a nuanced understanding of the consequences of gastrointestinal bleeding emerged [19]. Foremost among these outcomes was the decrease in hematocrit levels, indicative of the loss of red blood cells and the ensuing impact on oxygen-carrying capacity. This decrease, often a hallmark of significant bleeding episodes, underscored the severity of the condition and the imperative for prompt intervention [20]. Furthermore, the analysis elucidated the correlation between gastrointestinal bleeding severity and the requirement for blood transfusions, with more extensive bleeding precipitating a greater need for transfusion support to restore hemostasis.

Beyond the immediate clinical implications, the retrospective analysis delved into the broader ramifications of gastrointestinal bleeding on patient outcomes and healthcare resource utilization [21]. It elucidated the heightened risk of adverse events, including hemodynamic instability and the need for intensive care unit admissions, among patients experiencing severe bleeding episodes [22]. Moreover, the analysis shed light on the prolonged hospital stays and increased healthcare costs associated with managing gastrointestinal bleeding, accentuating the substantial burden imposed on both patients and healthcare systems alike.

Amidst the retrospective reflection, insights emerged that have the potential to inform clinical practice and guide future research endeavors [23]. The identification of modifiable risk factors underscores the importance of targeted interventions aimed at mitigating the predisposing factors contributing to gastrointestinal bleeding. From lifestyle modifications to judicious medication management, these interventions offer avenues for preventive strategies aimed at reducing the incidence of bleeding episodes and their associated morbidity [24].

Furthermore, the retrospective analysis serves as a catalyst for the exploration of novel therapeutic modalities and risk prediction models tailored to the individualized management of gastrointestinal bleeding. By leveraging advancements in technology and harnessing the power of predictive analytics, clinicians can proactively identify high-risk patients and institute preemptive measures to forestall adverse outcomes [25].

The retrospective analysis offers a panoramic view of the intricate tapestry of gastrointestinal bleeding, unraveling its risk factors and clinical outcomes with meticulous scrutiny. As we reflect on the lessons gleaned from this journey, we are poised to embark on a trajectory towards enhanced patient care, armed with insights that transcend the confines of the past and illuminate the path forward in the management of this complex medical concern.

### **CONCLUSION:**

Our retrospective analysis delved into the risk factors and clinical consequences of gastrointestinal bleeding, focusing on its impact on hematocrit levels and the need for blood transfusions. By scrutinizing patient data, we identified significant associations between various risk factors and the incidence of bleeding, shedding light on crucial predictive markers for clinicians. Moreover, our findings underscored the importance of timely interventions in managing gastrointestinal bleeding to mitigate the decline in hematocrit levels and reduce the necessity for blood transfusions, ultimately improving patient outcomes. This study contributes valuable insights to the field, informing future research directions and clinical practices aimed at optimizing patient care in cases of gastrointestinal bleeding.

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