E-ISSN 2250-0944
ISSN 2250-1150
doi: 10.31838/ijprt/16.02.476

Research Article

Clinical Profile and Outcomes of Patients with Concurrent Acute Myocardial Infarction and Gastrointestinal Bleeding: Challenges in Antithrombotic Management

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Received: 20.06.26, Revised: 20.08.26, Accepted: 29.08.26

ABSTRACT

Background: Concurrent acute myocardial infarction (AMI) and gastrointestinal bleeding (GIB) presents a major therapeutic challenge because antithrombotic therapy reduces ischemic risk but may worsen active bleeding. Careful balancing of these competing risks is essential for improving outcomes.

Objective: To evaluate the clinical profile, antithrombotic management, and in-hospital outcomes of patients presenting with concurrent AMI and GIB.

Methods: This retrospective observational study was conducted at the Department of Internal Medicine Saidu Teaching Hospital Swat from August 2025 to December 2025. Demographic characteristics, comorbidities, type of AMI, hemoglobin level, left ventricular ejection fraction (LVEF), bleeding presentation, endoscopic management, transfusion requirement, antithrombotic therapy, and in-hospital outcomes were recorded.

Results: The mean age was 63.92±11.60 years, and 78 (65.0%) patients were male. STEMI was present in 67 (55.8%) patients. Patients with adverse outcomes had lower hemoglobin (8.50±2.00 vs. 10.30±1.80 g/dL, p<0.001) and lower LVEF (39.80±10.20% vs. 48.70±9.50%, p<0.001). Antithrombotic therapy was interrupted in 61 (50.8%) patients. Interruption was associated with more recurrent myocardial ischemia (26.2% vs. 6.8%, p=0.004) and reinfarction (18.0% vs. 5.1%, p=0.027), whereas rebleeding was more frequent when therapy was continued (25.4% vs. 11.5%, p=0.048). Independent predictors of adverse outcomes included cardiogenic shock (adjusted OR 4.76), chronic kidney disease (OR 3.02), hemoglobin <9 g/dL (OR 2.88), antithrombotic interruption >24 hours (OR 2.79), LVEF <40% (OR 2.67), transfusion requirement (OR 2.42), STEMI (OR 2.31), and age ≥65 years (OR 2.24).

Conclusion: Patients with concurrent AMI and GIB have substantial risks of both ischemic and bleeding complications. Prolonged interruption of antithrombotic therapy was associated with increased recurrent ischemia, while continuation increased rebleeding. Individualized management, early bleeding control, and timely resumption of antithrombotic therapy are essential.

Keywords: Acute Myocardial Infarction, Gastrointestinal Bleeding, Antithrombotic Therapy, Dual Antiplatelet Therapy, Rebleeding, Reinfarction, Clinical Outcomes.

INTRODUCTION

Although reperfusion therapy and secondary prevention have improved, acute myocardial infarction (AMI) continues to be a significant cardiovascular emergency and has significant morbidity and mortality [1]. The gastrointestinal bleeding (GIB) is an important complication in patients with acute coronary syndromes as many patients will need antiplatelet and anticoagulant during the acute treatment of the condition. Concurrent AMI and GIB is relatively infrequent, but when it occurs

it becomes a challenging clinical circumstance as it is necessary to treat one condition without negatively impacting the other. GIB following PCI in a large national cohort was associated with significantly higher short and long term mortality than other patients who did not have bleeding [3]. The use of dual antiplatelet therapy (DAPT) with aspirin and a P2Y12 inhibitor is at the core of management of AMI, especially following PCI [4]. Other antithrombotic medications (e.g., anti-coagulants) may also be needed during hospitalisation in some patients. However, these therapies have the potential of causing bleeding, particularly in older individuals, and patients with renal impairment, anemia, a prior gastrointestinal disease, or multiple comorbidities [5]. Evidence has been accumulating in the past that significant bleeding is linked to increased hospital stay, and to a significantly increased in-hospital mortality rate among ACS patients [6]. The appearance of GIB in the acute phase of MI, or even throughout the acute phase, is a serious therapeutic problem. Interruption of aspirin, P2Y12 inhibitors and/or anticoagulation may increase risk for recurrent myocardial infarction, stent thrombosis and other ischemic events, while continuing antithrombotic therapy may result in worsening of active bleeding [7]. This balance is especially difficult when antiplatelet therapy needs to be interrupted after recent coronary stenting, as there is significant thrombotic risk [8]. A population-based study also showed an increased incidence of acute GIB in those who received combination antiplatelet and anticoagulant therapy versus antiplatelet therapy alone [9].

The management and prognosis of concurrent GIB may also be affected by the management and prognosis of AMI. A previous study found that AMI patients who developed within 24 hours of the GIB hospitalization had significantly increased in-hospital mortality and were less likely to receive invasive coronary interventions as compared to patients who had AMI without prior GIB [10]. In patients who went on to develop GIB after AMI, cardiogenic shock, more myocardial injury and mechanical ventilation were particularly associated with poor outcome [11]. So, early recognition and management of any bleeding source is important. Endoscopy may be diagnostic and therapeutic, and previous studies indicate that fewer patients with acute coronary syndrome and GIB die, and stay in the hospital, when gastrointestinal endoscopy was performed simultaneously with the acute coronary syndrome [12]. A specific evaluation of early endoscopy has been conducted in patients with acute coronary syndrome and upper GIB with antithrombotic therapy [13]. Another important strategy to minimize the risk of gastrointestinal bleeding is proton pump inhibitor (PPI) therapy in patients on dual antiplatelet therapy [14]. The current guidelines focus on personalized evaluation of ischemic and bleeding risks, and do not recommend the blanket discontinuation of all antithrombotic therapy [15]. Most studies indicate that aspirin for secondary cardiovascular prevention should be continued or restarted immediately after endoscopic control of bleeding, though it may take some time to restart P2Y12 inhibitors following endoscopic control of bleeding, and this should be coordinated between the gastroenterology and cardiology teams [16].

Objective

To evaluate the clinical profile, antithrombotic management, and in-hospital outcomes of patients presenting with concurrent AMI and GIB.

METHODOLOGY

This retrospective observational study was conducted at the Department of Internal Medicine Saidu Teaching Hospital Swat from August 2025 to December 2025. A total of 120 adult patients diagnosed with concurrent acute myocardial infarction (AMI) and gastrointestinal bleeding (GIB) were included. AMI was diagnosed on the basis of compatible clinical features, electrocardiographic changes, and elevated cardiac biomarkers, while GIB was identified by hematemesis, melena, hematochezia, a documented fall in hemoglobin with suspected gastrointestinal blood loss, or endoscopic confirmation. Patients aged ≥18 years with ST-elevation myocardial infarction or non-ST-elevation myocardial infarction and gastrointestinal bleeding occurring at presentation or during the same hospitalization were included. Patients with traumatic bleeding, non-gastrointestinal sources of blood loss, incomplete medical records, or an alternative diagnosis for elevated cardiac biomarkers were excluded.

Data Collection

Demographic and clinical information including age, gender, smoking status, hypertension, diabetes mellitus, ischemic heart disease, chronic kidney disease, previous

gastrointestinal disease, prior bleeding history, and use of antiplatelet or anticoagulant therapy was recorded. Details of AMI included type of infarction, presenting symptoms, electrocardiographic findings, cardiac biomarkers, left ventricular ejection fraction, cardiogenic shock, and coronary intervention. Gastrointestinal bleeding variables included presenting manifestation, hemoglobin level, requirement for blood transfusion, suspected or confirmed bleeding source, endoscopy, and endoscopic intervention. Antithrombotic management was documented, including aspirin, P2Y12 inhibitors, anticoagulants, continuation or temporary interruption of therapy, timing of resumption, and use of proton pump inhibitors. Clinical outcomes included recurrent ischemia, rebleeding, need for transfusion, intensive care admission, length of hospital stay, cardiogenic shock, reinfarction, stroke, and in-hospital mortality.

Statistical Analysis

Data were entered and analyzed using SPSS version 26.0. Continuous variables such as age, hemoglobin, ejection fraction, and hospital stay were expressed as mean±SD or median with interquartile range depending on data distribution. Categorical variables were presented as frequency and percentage. The Shapiro–Wilk test was used to assess normality. Chi-square or Fisher's exact test was applied for categorical comparisons, while independent-samples t-test or Mann–Whitney U test was used for continuous variables. Patients were compared according to adverse clinical outcome and according to whether antithrombotic therapy was continued or interrupted. Multivariable logistic regression was used to identify independent predictors of adverse outcomes, with adjusted odds ratios and 95% confidence intervals reported. A p-value ≤0.05 was considered statistically significant.

RESULTS

Among 120 patients, the mean age was 63.92±11.60 years, being higher in those with adverse outcomes than those without (68.30±10.70 vs. 61.20±11.30 years, p=0.001). Males accounted for 78 (65.0%) patients. Diabetes was more common in the adverse-outcome group (60.9% vs. 37.8%, p=0.014), as were chronic kidney disease (41.3% vs. 13.5%, p<0.001), previous gastrointestinal disease (39.1% vs. 18.9%, p=0.015), and previous anticoagulant use (23.9% vs. 9.5%, p=0.031). Hypertension was present in 82 (68.3%) and smoking in 45 (37.5%), without significant differences.

Table I. Baseline Characteristics According to In-Hospital Outcome

Variable	Total (n=120)	No adverse outcome (n=74)	Adverse outcome (n=46)	Test statistic	p-value
Age, years, Mean±SD	63.92±11.60	61.20±11.30	68.30±10.70	t=3.46	0.001
Male, n (%)	78 (65.0)	46 (62.2)	32 (69.6)	χ^2=0.68	0.408
Hypertension, n (%)	82 (68.3)	46 (62.2)	36 (78.3)	χ^2=3.40	0.065
Diabetes mellitus, n (%)	56 (46.7)	28 (37.8)	28 (60.9)	χ^2=6.05	0.014
Current/former smoking, n (%)	45 (37.5)	25 (33.8)	20 (43.5)	χ^2=1.14	0.286
Chronic kidney disease, n (%)	29 (24.2)	10 (13.5)	19 (41.3)	χ^2=11.95	<0.001
Previous gastrointestinal disease, n (%)	32 (26.7)	14 (18.9)	18 (39.1)	χ^2=5.93	0.015
Previous antiplatelet therapy, n (%)	70 (58.3)	42 (56.8)	28 (60.9)	χ^2=0.20	0.657
Previous anticoagulant therapy, n (%)	18 (15.0)	7 (9.5)	11 (23.9)	χ^2=4.65	0.031

STEMI was present in 67 (55.8%) patients and was more frequent among those with adverse outcomes (69.6% vs. 47.3%, p=0.017). Mean hemoglobin was lower in the adverse-outcome group (8.50±2.00 vs. 10.30±1.80 g/dL, p<0.001), while mean LVEF was also lower

(39.80±10.20% vs. 48.70±9.50%, p<0.001). Melena was the commonest bleeding presentation in 64 (53.3%), followed by hematemesis in 34 (28.3%), hematochezia in 12 (10.0%), and occult bleeding in 10 (8.3%). Blood transfusion was required in 57 (47.5%) and was significantly more frequent in the adverse group (71.7% vs. 32.4%, p<0.001), while endoscopic hemostasis was required in 31 (25.8%) and was also more common with adverse outcomes (39.1% vs. 17.6%, p=0.009).

Table II. Clinical Profile of Acute Myocardial Infarction and Gastrointestinal Bleeding

Clinical Variable	Total (n=120)	No adverse outcome (n=74)	Adverse outcome (n=46)	Test statistic	p-value
STEMI, n (%)	67 (55.8)	35 (47.3)	32 (69.6)	χ^2=5.70	0.017
NSTEMI, n (%)	53 (44.2)	39 (52.7)	14 (30.4)		
Hemoglobin, g/dL, Mean±SD	9.61±2.07	10.30±1.80	8.50±2.00	t=4.98	<0.001
LVEF, %, Mean±SD	45.29±10.73	48.70±9.50	39.80±10.20	t=4.77	<0.001
Melena, n (%)	64 (53.3)	40 (54.1)	24 (52.2)	χ^2=0.04	0.841
Hematemesis, n (%)	34 (28.3)	19 (25.7)	15 (32.6)	χ^2=0.67	0.413
Hematochezia, n (%)	12 (10.0)	8 (10.8)	4 (8.7)	χ^2=0.14	0.707
Occult GIB/fall in Hb, n (%)	10 (8.3)	7 (9.5)	3 (6.5)	χ^2=0.32	0.571
Underwent PCI, n (%)	76 (63.3)	50 (67.6)	26 (56.5)	χ^2=1.49	0.222
Blood transfusion required, n (%)	57 (47.5)	24 (32.4)	33 (71.7)	χ^2=17.57	<0.001
Gastrointestinal endoscopy performed, n (%)	78 (65.0)	52 (70.3)	26 (56.5)	χ^2=2.36	0.125
Endoscopic hemostasis required, n (%)	31 (25.8)	13 (17.6)	18 (39.1)	χ^2=6.88	0.009

Aspirin was administered to 109 (90.8%), P2Y12 inhibitors to 101 (84.2%), and anticoagulation to 84 (70.0%) patients. Any antithrombotic interruption occurred in 61 (50.8%) and was more frequent in patients with adverse outcomes (69.6% vs. 39.2%, p=0.001). Complete interruption for >24 hours occurred in 32 (26.7%) and was also more common in the adverse group (45.7% vs. 14.9%, p<0.001). Aspirin continuation was higher in patients without adverse outcomes (73.0% vs. 50.0%, p=0.011), as was continuation of P2Y12 inhibitors (60.8% vs. 37.0%, p=0.011). Proton pump inhibitors were used in 115 (95.8%).

Table III. Antithrombotic Management According to Clinical Outcome

Management Variable	Total (n=120)	No adverse outcome (n=74)	Adverse outcome (n=46)	Test statistic	p-value
Aspirin administered, n (%)	109 (90.8)	70 (94.6)	39 (84.8)	χ^2=3.28	0.070
P2Y12 inhibitor administered, n (%)	101 (84.2)	65 (87.8)	36 (78.3)	χ^2=1.95	0.162
Anticoagulation administered, n (%)	84 (70.0)	57 (77.0)	27 (58.7)	χ^2=4.54	0.033
Any antithrombotic interruption, n (%)	61 (50.8)	29 (39.2)	32 (69.6)	χ^2=10.47	0.001
Complete interruption >24 hours, n (%)	32 (26.7)	11 (14.9)	21 (45.7)	χ^2=13.75	<0.001
Aspirin continued despite GIB, n (%)	77 (64.2)	54 (73.0)	23 (50.0)	χ^2=6.51	0.011

P2Y12 inhibitor continued, n (%)	62 (51.7)	45 (60.8)	17 (37.0)	χ^2=6.46	0.011
Proton pump inhibitor therapy, n (%)	115 (95.8)	70 (94.6)	45 (97.8)	χ^2=0.74	0.389
Antithrombotic therapy resumed ≤3 days*	43/61 (70.5)	24/29 (82.8)	19/32 (59.4)	χ^2=4.00	0.046

*Among patients in whom antithrombotic therapy was interrupted.

Patients with antithrombotic interruption had more recurrent myocardial ischemia (26.2% vs. 6.8%, p=0.004) and reinfarction (18.0% vs. 5.1%, p=0.027), whereas rebleeding was more frequent when therapy was continued (25.4% vs. 11.5%, p=0.048). Cardiogenic shock occurred in 21.3% versus 10.2% (p=0.095), stroke in 4.9% versus 3.4% (p=0.675), and in-hospital mortality in 14.8% versus 6.8% (p=0.160). ICU admission was more frequent after interruption (50.8% vs. 28.8%, p=0.014), and mean hospital stay was longer (10.10±4.70 vs. 7.30±3.50 days, p<0.001).

Table IV. Clinical Outcomes According to Antithrombotic Interruption

Outcome	Antithrombotic interrupted (n=61)	Therapy continued (n=59)	Test statistic	p-value
Recurrent myocardial ischemia, n (%)	16 (26.2)	4 (6.8)	χ^2=8.17	0.004
Reinfarction, n (%)	11 (18.0)	3 (5.1)	χ^2=4.88	0.027
Rebleeding, n (%)	7 (11.5)	15 (25.4)	χ^2=3.90	0.048
Cardiogenic shock, n (%)	13 (21.3)	6 (10.2)	χ^2=2.79	0.095
Stroke, n (%)	3 (4.9)	2 (3.4)	χ^2=0.18	0.675
ICU admission, n (%)	31 (50.8)	17 (28.8)	χ^2=6.05	0.014
In-hospital mortality, n (%)	9 (14.8)	4 (6.8)	χ^2=1.97	0.160
Hospital stay, days, Mean±SD	10.10±4.70	7.30±3.50	t=3.71	<0.001

Independent predictors of adverse in-hospital outcome included cardiogenic shock (adjusted OR 4.76, 95% CI 1.63–13.90, p=0.004), chronic kidney disease (OR 3.02, 95% CI 1.28–7.12, p=0.012), hemoglobin <9 g/dL (OR 2.88, 95% CI 1.32–6.28, p=0.008), complete antithrombotic interruption >24 hours (OR 2.79, 95% CI 1.22–6.39, p=0.015), LVEF <40% (OR 2.67, 95% CI 1.18–6.04, p=0.019), requirement of ≥2 units blood transfusion (OR 2.42, 95% CI 1.09–5.37, p=0.030), STEMI presentation (OR 2.31, 95% CI 1.08–4.95, p=0.031), and age ≥65 years (OR 2.24, 95% CI 1.05–4.78, p=0.037).

Table V. Multivariable Predictors of Adverse In-Hospital Outcome

Predictor	Adjusted OR	95% CI	p-value
Age ≥65 years	2.24	1.05–4.78	0.037
STEMI presentation	2.31	1.08–4.95	0.031
Hemoglobin <9 g/dL	2.88	1.32–6.28	0.008
LVEF <40%	2.67	1.18–6.04	0.019
Chronic kidney disease	3.02	1.28–7.12	0.012
Cardiogenic shock	4.76	1.63–13.90	0.004
Requirement of ≥2 units blood transfusion	2.42	1.09–5.37	0.030
Complete antithrombotic interruption >24 hours	2.79	1.22–6.39	0.015

DISCUSSION

In the present study, 120 patients with acute myocardial infarction (AMI) and gastrointestinal

bleeding (GIB) were evaluated and we found that there were significant numbers of bad outcomes occurring during their hospital stay. The mean age was 63.92±11.60 years, with patients with adverse outcomes being significantly older than those without (68.30±10.70 vs. 61.20±11.30 years, p=0.001). The study population consisted of 65.0% males. The previous studies on AMI with GIB showed that the mean age was around 65 years and there was a higher representation of males, similar to the present study [16][17]. Comorbidities were strongly associated with poor outcomes. Type 2 Diabetes mellitus was also more prevalent in patients with adverse outcomes (60.9% vs 37.8%, p=0.014), and chronic kidney disease even more (41.3% vs 13.5%, p<0.001). Other gastrointestinal disease was also significantly more common in this group as was prior treatment with anticoagulants. Diabetes, renal dysfunction, anemia, and cardiovascular comorbidity were also found to be important factors associated with GIB and poor outcome after AMI in a previous study [18]. The prevalence of STEMI was 55.8% of patients and was more common in the adverse outcome group (69.6% vs. 47.3%, p=0.017). Patients who had adverse outcomes showed significantly lower mean LVEF (39.80±10.20% vs. 48.70±9.50%, p<0.001). A similar study showed that decreased LVEF, severe myocardial injury, and cardiogenic shock are predictors of mortality in AMI and GIB patients [19]. The severity of the gastrointestinal bleeding also affected prognosis. Patients with adverse outcomes had significantly lower levels of mean hemoglobin (8.50 ± 2.00 g/dL) than that of patients without adverse outcomes (10.30 ± 1.80 g/dL, p<0.001) and 71.7% of patients with adverse outcomes required a blood transfusion, whereas 32.4% of the patients without adverse outcomes did. Earlier studies also found that low hemoglobin and higher transfusion rates were linked to higher complication rates and mortality in patients with gastrointestinal bleeding who suffered from AMI [20]. The most frequent presentation in the present study was melena (53.3%) and 65.0% of these patients had undergone gastrointestinal endoscopy, and 25.8% needed endoscopic hemostasis. Previous studies have demonstrated that endoscopic assessment improves bleeding control and could reduce hospitalization and mortality in patients with GIB and acute coronary syndrome (ACS) [21]. Treatment of antithrombotic therapy was the primary clinical difficulty. Of patients, 50.8% had therapy interrupted, which was significantly higher in those with adverse outcomes (69.6% vs. 39.2%, p=0.001). The rate of complete interruption was statistically significantly higher in patients with adverse outcomes (45.7%) than in those without adverse outcomes (14.9%) for >24 hours. This is also consistent with previous studies showing that interruption of antiplatelet therapy, especially following coronary intervention, is associated with increased risk of recurrent ischemia and stent thrombosis [22]. There were some limitations to this study. The results may not be broadly applicable due to the small sample size and single-center study setting. The retrospective collection of data can also be linked to the problem of under documentation of data and/or selection bias. In not all patients gastrointestinal bleeding was clearly confirmed by endoscopy and long-term outcome after discharge was not evaluated. Furthermore, interruption of antithrombotic therapy and resumption of therapy were determined by the treating physician, creating treatment-selection bias.

CONCLUSION

Patients with concurrent acute myocardial infarction and gastrointestinal bleeding represent a high-risk clinical group with substantial ischemic and bleeding complications. Older age, chronic kidney disease, low hemoglobin, reduced left ventricular ejection fraction, STEMI, cardiogenic shock, transfusion requirement, and prolonged interruption of antithrombotic therapy were associated with adverse in-hospital outcomes. Interruption of antithrombotic therapy was associated with more recurrent ischemia and reinfarction, whereas continuation was associated with more rebleeding. Careful individualized assessment, early control of gastrointestinal bleeding, and timely resumption of antithrombotic therapy are therefore important to balance ischemic and hemorrhagic risks.

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