Original Article

Impact of Anticoagulation on Upper Gastrointestinal Bleeding in Cirrhosis

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ABSTRACT

Background: Liver cirrhosis is often associated with upper gastrointestinal bleeding (UGIB), complicating the clinical management due to the fragile hemostatic balance and potential for portal hypertension-related complications. Anticoagulation therapy, while necessary for preventing thrombotic events, may increase the risk of bleeding, making its use in cirrhotic patients a critical area of study.

Objective: To evaluate the impact of anticoagulation therapy on the incidence and severity of UGIB in patients with liver cirrhosis.

Methods: This prospective study enrolled 100 patients with liver cirrhosis at the Asian Institute of Medical Sciences (AIMS) in Hyderabad. Patients were randomly assigned into two groups: Group A (n=50), receiving anticoagulation therapy, and Group B (n=50), without anticoagulation. UGIB sources were diagnosed via upper digestive endoscopy. Data were analyzed using SPSS version 26.0.

Results: The mean age was 60.82 years (SD ± 8.98) in Group A and 62.20 years (SD ± 8.72) in Group B. Male participants comprised 68% and 62% of Groups A and B, respectively. Clinical outcomes showed shock incidence at 26% in Group A versus 12% in Group B (p=0.074), active bleeding at 30% versus 36% (p=0.523), hepatic failure at 20% versus 16% (p=0.603), and mortality rates at 16% versus 10% (p=0.372).

Conclusion: The study indicates that anticoagulation therapy does not significantly impact the likelihood of adverse clinical outcomes in patients with liver cirrhosis. However, the need to balance thrombosis prevention with bleeding risk underscores the necessity for further large-scale studies to refine anticoagulation guidelines in this population.

Keywords: Anticoagulation, Cirrhosis, Child Pugh Score, SPSS, Upper Gastrointestinal Bleeding, Thrombosis, Portal Hypertension.

INTRODUCTION

Anticoagulant therapy has historically complicated the management of upper gastrointestinal bleeding (UGIB), potentially exacerbating associated morbidity and mortality (1, 2). Liver cirrhosis has traditionally been characterized as a condition that predisposes individuals to bleeding, attributable to a reduction in platelet counts and an elongation of prothrombin time. However, this perception has been challenged by more recent findings indicating that patients with cirrhosis also experience reductions in anticoagulant proteins such as antithrombin III, protein S, and protein C, while procoagulant factors like Factor VIII and von Willebrand factor are elevated (3, 4). These alterations result in a fragile hemostatic balance, which readily tips towards thrombosis or hemorrhage under varying clinical conditions (5, 6).

Recent epidemiological data suggest that the incidence of thrombotic events in patients with chronic liver disease during hospitalization significantly exceeds that observed in the general population, with reported rates ranging from 0.5% to 6.3% (7). Factors such as severe portal hypertension (PH) and reduced portal blood flow velocity contribute to the emergence of splanchnic venous thrombosis, with annual median incidences approximating 16% (8, 9). In response to these challenges, the use of anticoagulants, including low-molecular-weight heparin (LMWH) and oral vitamin K antagonists, has been increasingly adopted due to their efficacy in vessel recanalization (10, 11). Despite this, the impact of anticoagulants on the outcomes of UGIB in cirrhotic patients remains poorly understood.

This study aims to assess the effects of anticoagulation therapy on the outcomes of UGIB in cirrhotic patients who were hospitalized for such events and had been receiving anticoagulant treatment for various therapeutic purposes. The objective is to elucidate whether prior anticoagulant use modifies the clinical trajectory of UGIB in this vulnerable population, thereby informing clinical management strategies and therapeutic guidelines.

MATERIAL AND METHODS

This prospective study was conducted in the Gastroenterology Department at the Asian Institute of Medical Sciences (AIMS) in Hyderabad. The research included a total of 100 patients diagnosed with liver cirrhosis for more than six months and presenting with upper gastrointestinal bleeding. The study population was divided into two groups of 50 patients each, with Group A receiving anticoagulation therapy and Group B not receiving such treatment. To ensure an even distribution between the groups, patients were randomized based on age, ranging from 30 to 75 years, and gender. The inclusion criteria encompassed both men and women who had received anticoagulation treatment at any point within the year preceding their admission and were treated within five days post-admission. Exclusion criteria were stringent, omitting any patients with a history of liver transplantation, pregnant or lactating women, and those diagnosed with malignancy or human immunodeficiency virus, as these conditions could interfere with the outcomes.

Severity of liver cirrhosis was meticulously assessed using the Child-Pugh Score, which ranges from 5 to 15 points, with higher scores indicating more severe disease. This score further classified patients into Class A (5-6 points), Class B (7-9 points), and Class C (10-15 points). Key laboratory parameters such as hemoglobin, platelet levels, and hematocrit were extracted from a complete blood count. Clinical records were meticulously reviewed to verify the history and current status of anticoagulant use. Upon hospital admission, anticoagulation was suspended, and any active upper gastrointestinal tract bleeding was diagnosed using upper digestive endoscopy.

Statistical analysis was performed using SPSS Version 26.0. The Chi-square test was employed to compare the impact of anticoagulation therapy on the incidence of active upper gastrointestinal bleeding, applying a significance level of 5%. This approach enabled the evaluation of whether anticoagulation therapy influenced the clinical outcomes of patients with liver cirrhosis experiencing upper gastrointestinal bleeding.

RESULTS

In the analyzed cohort of 100 patients stratified by anticoagulation status, the baseline characteristics and clinical outcomes revealed distinct profiles. The average age for patients receiving anticoagulation therapy was 60.82 years (± 8.98), while it was slightly higher at 62.20 years (± 8.72) for those not on anticoagulation therapy. The majority of patients in both subgroups were male, constituting 68.0% in the anticoagulated group and 62.0% in the non-anticoagulated group.

Regarding the severity of liver disease, measured by established scoring systems, the mean Child-Pugh score was 7.98 (± 2.29) for the anticoagulated patients and 8.26 (± 2.40) for the non-anticoagulated patients. The SOFA scores were also comparable, with the anticoagulated group having a mean score of 3.16 (± 1.82) and the non-anticoagulated group scoring slightly higher at 3.52 (± 1.70). The MELD scores, which provide further insight into liver disease severity, were 19.10 (± 7.64) for patients on anticoagulation and 16.52 (± 6.26) for those not receiving anticoagulation.

Hematological parameters showed a lower platelet count in patients on anticoagulation therapy, averaging 154.64 (± 55.83) × 10^3, compared to 137.34 (± 32.28) × 10^3 in the non-anticoagulated group. Hemoglobin levels were also lower in the anticoagulated group, with an average of 9.09 g/dl (± 2.24), versus 10.17 g/dl (± 2.59) in the other group. Similarly, hematocrit percentages were 28.68% (± 8.53) in the anticoagulated subgroup and slightly higher at 30.30% (± 9.18) in the non-anticoagulated subgroup.

The clinical outcomes were particularly telling, with shock occurring in 26.0% of the anticoagulated patients compared to only 12.0% in the non-anticoagulated group. Active bleeding was observed in 30.0% of patients on anticoagulation therapy, slightly lower than the 36.0% incidence in those without anticoagulation. Severe hepatic failure and mortality rates were also recorded, with severe hepatic failure occurring in 20.0% of the anticoagulated patients compared to 16.0% in the non-anticoagulated group, and mortality rates at 16.0% and 10.0%, respectively. These data suggest a nuanced relationship between anticoagulation therapy and the complex clinical outcomes in patients with liver cirrhosis and upper gastrointestinal bleeding.

Table I: Baseline characteristics, clinical response of patients (n=100)

Variables		Group Anticoagulation Therapy (n=50)	Group without Anticoagulation Therapy (n=50)
Age in years		60.82 ± 8.98	62.20 ± 8.72
Gender	Male, *n* (%)	34 (68.0)	31 (62.0)
	Female, *n* (%)	16 (32.0)	19 (38.0)
Child Pugh Score		7.98 ± 2.29	8.26 ± 2.40
SOFA score		3.16 ± 1.82	3.52 ± 1.70
MELD score		19.10 ± 7.64	16.52 ± 6.26
Platelets, $10^3/mm^3$		154.64 ± 55.83	137.34 ± 32.28
Hemoglobin, g/dl		9.09 ± 2.24	10.17 ± 2.59
Hematocrit, %		28.68 ± 8.53	30.30 ± 9.18

Table II: Comparison of outcomes b/w patients receiving anticoagulation therapy and those not receiving therapy (n=100)			
Variables	Group Anticoagulation Therapy	Group without Anticoagulation Therapy	P-Value
Shock, n (%)	13 (26.0)	6 (12.0)	0.074
Active Bleeding, n (%)	15 (30.0)	18 (36.0)	0.523
Hepatic Failure, n (%)	10 (20.0)	8 (16.0)	0.603
Mortality, n (%)	8 (16.0)	5 (10.0)	0.372

DISCUSSION

Anticoagulation therapy in patients with liver cirrhosis presents a clinical conundrum due to its impact on upper gastrointestinal bleeding (UGIB). Traditionally, cirrhosis is associated with portal hypertension, leading to variceal development and an increased risk of UGIB. The necessity for anticoagulation in these patients arises from conditions such as atrial fibrillation or venous thromboembolism, even though such treatment could intensify the bleeding risk due to compromised hemostatic balance. The literature presents mixed findings, with some studies suggesting that anticoagulants heighten the risk of bleeding, while others indicate potential benefits in mitigating thrombotic events without significantly increasing bleeding complications (13, 14).

The evolving understanding of natural anticoagulation mechanisms in cirrhosis and the observed increase in thrombotic events during follow-ups have prompted a shift towards favoring anticoagulant therapy. Although there is no direct evidence linking anticoagulants to an increased risk of portal hypertensive bleeding, the severity and mortality associated with a bleeding episode in

this patient group remain significant concerns. Notably, previous studies on noncirrhotic portal vein thrombosis (PVT) suggest that anticoagulation does not exacerbate UGIB severity or mortality, with venous bleeding outcomes being more favorable in patients without cirrhosis due to their relatively preserved liver function (15-18).

The current study aimed to evaluate the impact of anticoagulation on treatment failure, mortality, and severity of UGIB in cirrhotic patients. The exploratory analysis revealed distinct trends, including a higher incidence of shock in anticoagulated patients compared to controls, and similar rates of active bleeding and hepatic failure across both groups. These findings, although not statistically significant, suggest a complex interaction between anticoagulation therapy and clinical outcomes in cirrhosis.

Our study has several strengths, including the prospective design and the well-defined patient cohorts based on anticoagulation status. However, limitations must be acknowledged. The sample size, while adequate for initial explorations, may not provide the statistical power necessary to detect small but clinically significant differences. Moreover, the exclusion of patients with specific comorbid conditions, such as malignancies or HIV, may limit the generalizability of the findings.

In light of these results, the management of anticoagulation in cirrhosis requires a careful and individualized approach. Factors such as organ perfusion, oxygenation, nutritional status, and underlying kidney or liver disease might influence patient outcomes following UGIB. The nuanced decision-making process should weigh the risks of thrombosis against the potential for severe bleeding. Integrated care involving frequent endoscopic monitoring and close collaboration between hepatology and hematology specialists is essential to navigate the complexities of anticoagulation in these patients.

This study underscores the importance of individualized patient assessment and the need for larger, multicentric studies to further elucidate the impact of anticoagulation in the context of liver cirrhosis and UGIB. Such research would refine our understanding of how to balance thrombotic prophylaxis with hemorrhagic risk, ultimately enhancing patient care in this high-risk population.

CONCLUSION

In conclusion, this study suggests that anticoagulation does not markedly alter the risk of adverse clinical outcomes in patients with liver cirrhosis. While anticoagulation therapy does not significantly exacerbate complications, the inherent bleeding risks in cirrhotic patients warrant a cautious approach. Consequently, there is a critical need for larger, more robust trials to precisely delineate the relationship between anticoagulation and clinical outcomes in this vulnerable population. Such studies are essential to guide the therapeutic strategies that balance the benefits of preventing thrombotic events against the potential risks of increased bleeding, ultimately improving the management and prognosis of patients with liver cirrhosis.

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