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Original Research Article

Comparison of Efficacy of Terlipressin Versus Octreotide in Management of Acute Variceal Hemorrhage

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Abstract: *Acute oesophageal variceal bleeding is a life-threatening complication of liver cirrhosis requiring urgent medical intervention. Terlipressin and octreotide are commonly used pharmacologic agents, but comparative data on their efficacy in achieving haemostasis prior to endoscopic intervention remain inconclusive.* ***Objective:*** *To compare the efficacy of terlipressin and octreotide in controlling bleeding in cirrhotic patients with acute variceal haemorrhage during the pre-endoscopic period.* ***Methods:*** *This prospective observational cohort study was conducted over three months January to March, 2025 at the Department of Internal Medicine, Shalamar Hospital, Lahore. A total of 114 patients with cirrhosis and acute variceal bleeding were included, with 57 patients receiving terlipressin and 57 receiving octreotide based on physician preference. The primary outcome was pre-endoscopic hemostasis, defined by clinical and endoscopic criteria. Baseline demographics, bleeding control rates, and hospital stay durations were analyzed.* ***Results:*** *The mean age of participants was 51.6 ± 7 years, with 71.8% being male. The most common etiology of cirrhosis was hepatitis C (55%). Bleeding control was achieved in 88% of patients in the terlipressin group and 85% in the octreotide group (p = 0.787). The average length of hospital stay was 5.61 days for the terlipressin group and 5.21 days for the octreotide group (p = 0.395), with no significant difference between the two.* ***Conclusion:*** *Both terlipressin and octreotide are effective in achieving pre-endoscopic haemostasis in patients with acute variceal bleeding. While terlipressin showed a slightly higher success rate, the difference was not statistically significant. Either agent can be considered in emergency settings, particularly when endoscopy is delayed or unavailable.*

Keywords: Acute variceal bleeding, Terlipressin, Octreotide, Cirrhosis, Pre-endoscopic haemostasis, Pharmacologic therapy

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Introduction

Gastro-oesophageal varices are identified in approximately 30% of patients with compensated cirrhosis and about 60% of those with decompensated cirrhosis. In Pakistan, oesophageal variceal bleeding occurs in 25–35% of cirrhotic patients annually (1). Oesophageal variceal bleeding is a medical emergency with a high mortality rate despite appropriate management. Endoscopic intervention combined with pharmacologic treatment successfully controls bleeding in nearly 70–80% of variceal bleeding episodes (2,3,4).

Endoscopic variceal band ligation (EVL) is the preferred procedure for controlling acute oesophageal variceal bleeding. However, endoscopic injection sclerotherapy may be employed when EVL is technically challenging. Adjuvant pharmacological therapy is the standard of care alongside EVL. Terlipressin and octreotide are two commonly used agents in the pharmacologic management of variceal bleeding and are considered to have similar efficacy (5,6).

The exact mechanism of octreotide in portal hypertension remains unclear. Continuous intravenous (IV) octreotide therapy in cirrhotic patients has been proposed to control oesophageal variceal bleeding due to its assumed effect on reducing portal pressure and splanchnic blood flow. However, studies have shown that octreotide does not significantly affect hepatic venous pressure gradient, wedged hepatic venous pressure, or hepatic blood flow. Despite this, octreotide maintains a favorable safety profile when used in conjunction with EVL (7,8).

Terlipressin, a vasopressin analogue, reduces portal hypertension by inducing splanchnic vasoconstriction. Unlike vasopressin, terlipressin lacks plasminogen-activating properties, thereby minimizing the risk of worsening coronary ischemia in patients experiencing variceal bleeding (2,9).

In a randomized controlled trial involving 324 patients, 163 patients received terlipressin (Group A) and 161 received octreotide (Group B). The baseline characteristics between the two groups were comparable. Active bleeding was observed during upper gastrointestinal endoscopy in 26 patients (16%) in Group A and 41 patients (25.5%) in Group B (p = 0.034) (10). Another study, including 100 patients, also compared terlipressin and octreotide. In Group A (terlipressin), 92.0% of patients achieved controlled bleeding at the time of endoscopy, compared to 72.0% in Group B (octreotide), indicating superior bleeding control with terlipressin (6).

The rationale for this study arises from the pressing need to identify the most effective pharmacological intervention for acute variceal haemorrhage in emergency settings, particularly when endoscopic treatment is delayed or unavailable. Although both terlipressin and octreotide are commonly employed to achieve initial haemostasis, current literature lacks conclusive evidence directly comparing their efficacy in controlling bleeding before endoscopy. This knowledge gap introduces uncertainty in clinical decision-making, which may adversely impact patient outcomes. By evaluating and comparing the effectiveness of terlipressin and octreotide in achieving pre-endoscopic haemostasis, this study seeks to generate critical evidence to inform and optimize emergency management protocols for variceal bleeding.

Therefore, the objective of our study was to compare the efficacy of terlipressin and octreotide in controlling bleeding in cirrhotic patients with acute variceal haemorrhage during the period preceding endoscopy.

Methodology

This prospective observational cohort study was conducted over three months from January to March, 2025 in the Department of Internal

Medicine at Shalamar Hospital, Lahore. A sample size of 114 patients, with 57 in each treatment group, was calculated using OpenEpi. The calculation was based on an assumed efficacy of 92% for terlipressin and 72% for octreotide, with a 95% confidence interval and 80% power, as supported by prior literature (10). Purposive sampling (a non-probability sampling technique) was used to recruit eligible participants from the Department of Internal Medicine.

Patients were included in the study if they were between 18 and 60 years of age, of either gender, diagnosed with cirrhosis (as per operational definition), and presenting with acute variceal bleeding. Acute variceal bleeding was defined as hematemesis and/or ongoing melena within 24 hours of symptom onset or hospital admission. Exclusion criteria included a history of allergic reaction to either terlipressin or octreotide, pregnancy or lactation, presence of other sources of gastrointestinal bleeding (such as peptic ulcer disease), history of prior trans jugular intrahepatic portosystemic shunt (TIPS) procedure or other surgical interventions for portal hypertension, and the presence of severe concurrent illnesses such as heart failure or renal failure.

Written informed consent was obtained from all eligible patients or their attendants before enrollment. As this was an observational study, treatment allocation was based on real-world clinical decision-making by the attending physician rather than through randomization. Patients were divided into two groups based on the pharmacologic agent administered. The Terlipressin Group received a 2 mg intravenous bolus at presentation, followed by 1 mg IV every 6 hours. The Octreotide Group received a 100-microgram intravenous bolus diluted in 100 ml normal saline, followed by a continuous infusion of 50 micrograms per hour for six hours. The rationale for selecting a particular treatment—whether due to physician preference, contraindications, or clinical severity—was documented for each patient to account for potential confounding factors during analysis. Data were collected using a researcher-administered proforma. Baseline demographic and clinical data included age, gender, etiology, and duration of cirrhosis, history of previous variceal bleeding, and any prior endoscopic interventions. All patients underwent upper gastrointestinal endoscopy within six hours of initial presentation. The presence or absence of active variceal bleeding at the time of endoscopy was used to assess the primary outcome of pre-endoscopic haemostasis.

The primary efficacy outcome was defined as the achievement of pre-endoscopic haemostasis. This was determined by the cessation of active bleeding before endoscopy, characterized by the absence of fresh hematemesis, hemodynamic stability (systolic blood pressure ≥90 mmHg without the need for excessive fluid resuscitation or vasopressor support, and heart rate ≤100 beats per minute), no requirement for urgent blood transfusion exceeding two units within the first six hours, stable hemoglobin levels with a decrease of no more than 1 g/dL, and no active variceal bleeding observed during endoscopy. Treatment failure was defined by persistent or recurrent hematemesis, hemodynamic instability necessitating vasopressor support or large-volume IV fluids, a drop in hemoglobin exceeding 2 g/dL, or endoscopic evidence of active variceal bleeding despite drug administration.

Results

A total of 114 patients with cirrhosis and acute variceal haemorrhage were enrolled in the study, with 57 patients in each treatment group (terlipressin and octreotide). Of the total participants, 82 (71.82%) were male and 32 (28.18%) were female.

Table 1: Demographic Characteristics

	Mean value (± SD)
Age	51.6 ± 7 years
BMI	24.6 ± 32 kg/m^2

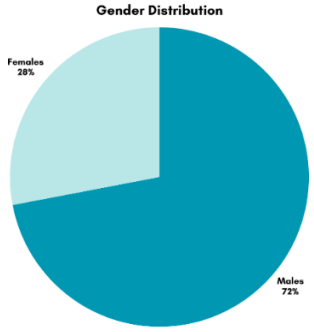

Image 1: Gender Distribution.

The most common etiology of cirrhosis was hepatitis C virus (HCV) infection, accounting for 55% of the cases (n = 63), followed by non-B, non-C cirrhosis in 22% (n = 25), hepatitis B virus (HBV) in 11% (n = 13), alcoholic liver disease in 8% (n = 9), and autoimmune or other causes in 4% (n = 4).

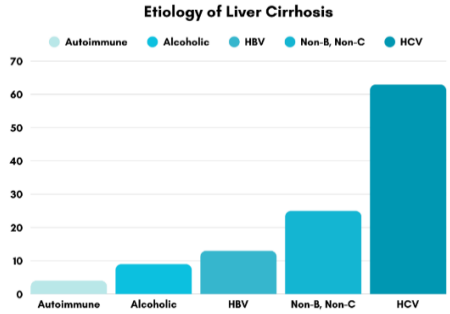

Image 2: Etiology of Liver Cirrhosis

The mean duration of liver disease was 10.6 ± 3.8 years. A prior history of variceal bleeding was noted in 27% (n = 31) of patients, and 15% (n = 17) had undergone previous endoscopic interventions.

Table 2: Hospital stay duration comparison between both groups

	Mean Hospital Stay	Range	P-value
Terlipressin	5.61 days	1-15 days	0.395
Octreotide	5.21 days	1-13 days	

Pre-endoscopic bleeding control was achieved in 88% (n = 50) of patients in the terlipressin group and 85% (n = 48) in the octreotide group. The difference in bleeding control between the two groups was not statistically significant (p = 0.787).

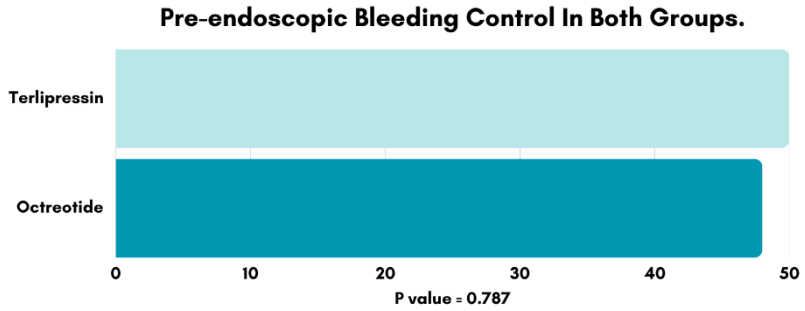

Image 3: Pre-endoscopic Bleeding Control In Both Groups

Discussion

This prospective observational cohort study aimed to compare the efficacy of terlipressin and octreotide in achieving pre-endoscopic haemostasis in patients presenting with acute variceal bleeding due to cirrhosis. The rationale behind the use of these vasoactive drugs for hemorrhagic control was to produce splanchnic vasoconstriction, resulting in a decrease in portal inflow and portal pressures (11). Our findings demonstrate that both terlipressin and octreotide are effective pharmacological agents in the initial management of variceal haemorrhage, with bleeding control achieved in 88% and 85% of patients, respectively. The difference was not statistically significant (p = 0.787), indicating comparable efficacy of both agents in the pre-endoscopic setting. This finding aligns with previous studies (12, 13, 14, 15), although it contrasts sharply with other reports suggesting that terlipressin is more effective than octreotide in reducing variceal pressure (16,17).

The high rate of bleeding control observed in both groups is consistent with previous literature. Studies have shown that pharmacologic therapy alone can achieve hemostasis in up to 80% of cases of acute variceal bleeding when endoscopy is delayed or unavailable (3). Our findings reaffirm the utility of these agents as effective interim measures, particularly in resource-limited settings where immediate endoscopy may not be feasible.

Terlipressin, a synthetic vasopressin analogue, acts via splanchnic vasoconstriction to reduce portal pressure, thereby decreasing variceal flow (18). Octreotide, although widely used, has a less defined mechanism of action (19). While its role in reducing splanchnic blood flow is acknowledged, studies have shown minimal direct effect on hepatic venous pressure gradient. Despite this, its efficacy in clinical settings remains well supported, as also reflected in our study.

In a randomized trial by Seo et al., the control of active bleeding was superior in patients receiving terlipressin compared to octreotide, which is in agreement with our data, albeit without statistical significance in our cohort. Our study supports the notion that terlipressin may offer a marginal advantage in achieving early haemostasis; however, both drugs are effective when used promptly after presentation.

The demographic profile of our study population reflects the regional burden of cirrhosis, with hepatitis C virus (HCV) infection being the most prevalent etiology (55%) (20). The predominance of male patients (71.8%) is also consistent with previously reported gender distributions in cirrhotic populations (21).

Although the mean duration of hospital stay was slightly longer in the terlipressin group (5.61 vs 5.21 days), this difference was not statistically significant (p = 0.395), indicating that both therapies are comparable not only in terms of efficacy but also in influencing hospital resource utilization.

This study has several strengths. It addresses an important clinical question relevant to emergency care in cirrhotic patients. Furthermore, it reflects real-world clinical practice by evaluating the performance of these agents under non-randomized, observational conditions. However, the study also has limitations. Being a single-center, non-randomized study, it is subject to selection bias and lacks the rigorous control of confounding variables that randomized controlled trials offer. Additionally, the sample size, while adequate for detecting a moderate difference, may not be sufficient to capture smaller, clinically meaningful variations in efficacy.

Conclusion

In conclusion, both terlipressin and octreotide were effective in achieving pre-endoscopic haemostasis in cirrhotic patients with acute variceal bleeding. While terlipressin demonstrated a slightly higher rate of bleeding control, the difference was not statistically significant. These findings support the continued use of either agent in emergency settings, particularly where timely endoscopic intervention is not immediately available. Future large-scale, randomized studies are warranted to further delineate the comparative effectiveness of these agents and guide evidence-based clinical decision-making.

Declarations

Data Availability statement
All data generated or analysed during the study are included in the manuscript.
Ethics approval and consent to participate
Approved by the department concerned. (IRBEC-MMS-033-24)
Consent for publication
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Conflict of interest

The authors declared the absence of a conflict of interest.

Author Contribution

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SA (House Officer)
Manuscript drafting, Study Design,
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All authors reviewed the results and approved the final version of the manuscript. They are also accountable for the integrity of the study.

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