

Clinical Vignette

The Use of Terlipressin for Decompensated Cirrhosis in a Regional Hospital in the Home Setting – Case Series

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Background

Terlipressin is an established therapy for hepatorenal syndrome and variceal bleeding in the setting of decompensated cirrhosis. The administration of terlipressin for these indications or as a bridge to transplantation often requires prolonged infusions and therefore may be appropriate to administer in an ambulatory hospital in the home (HITH) setting. The literature surrounding its use at home is limited and often restricted to tertiary academic metropolitan areas. We describe the first case series of patients receiving terlipressin for treatment of portal hypertensive complications in a regional hospital.

Methods

We performed a retrospective case series of all patients treated with terlipressin via continuous infusion in our HITH in a regional hospital in Australia from 2020 to 2025. Patients were identified using the electronic medical record (EMR) and pharmacy dispensing records. Patient demographics, rationale for terlipressin receipt, unplanned escalations of care, and reason for terlipressin discontinuation were all collected.

Results

We identified 9 patients who received terlipressin for decompensated cirrhosis. The mean age was 51, 55% were female. The most common indication for terlipressin was refractory fluid overload. The mean duration of terlipressin receipt via HITH was 129 days (range 21 to 380). Each patient had an unexpected escalation of care a mean of 3 times (range 1 to 5) with variceal bleeding, peripherally inserted central venous catheter complications and infection being the most common (4, 5 and 6 episodes respectively). Terlipressin was well tolerated with only 3 patients needing cessation (hyponatraemia, hypotension and over diuresis triggering encephalopathy). 3 patients received liver transplants as the end point of their therapy.

Conclusion

Terlipressin can feasibly be used in a regional HITH setting but is associated with an appreciable return to bed-based care rate due to natural history rate of complications of decompensated cirrhosis, necessitating a close working relationship with local and tertiary hepatology services.

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KEY POINTS

QUESTION

Terlipressin is used as a therapy for portal hypertensive complications of cirrhosis. Its use in a HITH setting has been described but is limited to tertiary metropolitan centres. Is terlipressin also able to be safely used in a regional HITH setting?

FINDINGS

We conducted a retrospective case series and identified 9 patients who received terlipressin over the past 5 years in our HITH service. Whilst there was a high return to bed-based care rate (mean 3 times for each patient) this was thought to reflect the severity of their liver disease rather than related to terlipressin issues. Overall terlipressin was well tolerated with only 3 patients needing cessation due to terlipressin side effects. 3 patients were bridged to a liver transplant.

MEANING

Terlipressin can be successfully used in a regional HITH setting as a bridge to liver transplantation. Given the often-prolonged period of terlipressin use, administration in a HITH setting is preferable to bed-based care. Whilst patients have a high rate of unplanned returns, this is felt to mostly be related to their underlying liver disease rather than terlipressin specific issues.

ABBREVIATIONS

Acute kidney injury (AKI)
Electronic medical record (EMR)
Hepatorenal syndrome (HRS)
Hospital in the home (HITH)
Metabolic dysfunction associated steatohepatitis (MASH)
Peripherally inserted central venous catheter (PICC)

INTRODUCTION

Terlipressin is a non-selective agonist of both the V1 and V2¹ receptors that has proven efficacy in the management of several complications of cirrhosis including variceal haemorrhage,² hepatorenal syndrome (HRS),³ hepatic hydrothorax and diuretic refractory ascites.⁴ Whilst terlipressin has traditionally been given as bolus dosing there is increasing evidence that delivering terlipressin as a continuous infusion leads both to lesser side effects as well as greater reductions in the hepato-portal venous gradient and lower rebleeding/treatment failure.^{1,4} Earlier initiation of terlipressin may also be more likely to lead to resolution of the acute kidney injury (AKI) associated with HRS and thus allow liver transplantation listing alone as opposed to combined liver / kidney transplantation.⁵ Given this potential for long-term terlipressin therapy, there is growing interest in its use in an ambulatory hospital in the home

(HITH) setting. HITH has been previously defined as the provision of hospital equivalent care to patients at home who would otherwise need to be in a brick-and-mortar hospital,^{6,7} allowing a patient centred approach with high levels of patient satisfaction.⁸ The safe use of terlipressin has been reported by others in tertiary academic settings in Australia⁹ and in the United States in a more limited fashion.¹⁰ Gow et al described 23 patients who received terlipressin through a tertiary institutions HITH service of which 17 required terlipressin for refractory ascites, fourteen received a liver transplant, and the mean duration of terlipressin receipt was 50 days with no significant adverse events reported.⁹ Another study of 102 patients treated with terlipressin via a tertiary HITH service showed 49 treatment-related adverse events, of which 84% were related to central line complications, with no events necessitating cessation of terlipressin.¹¹ The safe use of terlipressin in a regional HITH service has not been previously explored in scientific literature. We aim to describe the demographic characteristics, coexisting conditions and outcomes amongst patients receiving a continuous infusion of terlipressin for decompensated cirrhosis in a large regional hospital in Australia.

METHODS

We included patients who were admitted to the adult (18 years of age or older) HITH service of Barwon Health in Geelong, Australia who received terlipressin for treatment of portal hypertensive complications between the time period of January 1st 2020 to November 30th 2025. Patients were identified through the use of the electronic medical record (EMR) and pharmacy dispensing records for terlipressin continuous infusions. All patients who received terlipressin through our HITH service during the specified time period were included, with no exclusion criteria noted. We obtained demographic data including age, comorbid complications, underlying cause of liver disease, Child Pugh status, rationale for terlipressin administration and dosing, number of days on our HITH service receiving terlipressin, any unplanned escalation of care, any complications relating to their underlying liver disease or receipt of terlipressin, and rationale for terlipressin discontinuation. All unplanned returns / indications for terlipressin were at the discretion of the treating clinician. This project has ethics approval through Barwon Health's Research Ethics Governance and Integrity Unit (BH25/205). Consent was waived due to the negligible risk nature of data acquisition via retrospective datasets already maintained through an EMR. Descriptive statistics were used to summarise the data. Categorical variables were summarised as counts and percentages.

RESULTS

During the study period, nine adults (18 years of age or older) were identified. The demographic and clinical characteristics of the patients are shown in [Table 1](#). The mean age was 51 (range 40 to 71) and 55% were female. The most

common underlying cause of cirrhosis was autoimmune hepatitis in 4 patients (45%). 7 patients were Child Pugh C status (78%). Complications directly related to decompensated cirrhosis were common during inpatient admissions, with variceal bleeding and ascites/fluid overload being the most common (6 patients for each, 67% of the patient cohort). Comorbidities were common in our cohort, with type 2 diabetes mellitus being the most common in 4 patients (45%). Half of the patients were commenced on terlipressin for refractory fluid overload or ascites (55%).

Side effects of terlipressin were uncommon. 2 patients experienced abdominal pain necessitating a return to bed-based care for workup, however in both cases no particular cause was found and terlipressin was continued in both without interruption. 2 patients experienced hyponatraemia (nadir 118 and 121), one discovered during routine HITH blood tests and another during hospitalisation for an infected PICC site. Neither of these patients were receiving gabapentinoids. In the former this was thought to be due to intravascular volume depletion and was managed with receipt of concentrated albumin and withholding of diuretics without interruption to their terlipressin infusion, in the latter this was felt to be directly related to terlipressin with pausing of the infusion leading to improvement in the serum sodium. This infusion was subsequently not restarted as the patient remained well off it.

The most common indication for cessation of terlipressin was receipt of a liver transplant, occurring in 3 patients (33%). 3 patients discontinued terlipressin due to adverse events attributed to terlipressin (hyponatraemia, hypotension and overdiuresis triggering encephalopathy). Unplanned escalations of care necessitating return to bed-based care were common, with all patients experiencing at least one episode of unexpected escalation (mean 3, range 1 to 5). Variceal bleeding needing endoscopic intervention, peripherally related central venous catheter (PICC) complications (including 2 episodes of exit site infection, dislodgement, bleeding and presumed line sepsis without bacteraemia and sepsis/infection (including spontaneous bacterial peritonitis, line related sepsis without an identified organism, and two episodes of presumed infection without an identified source) were the most common reasons.

Complications directly rising from the underlying cirrhotic liver disease including encephalopathy and worsened fluid overload (pleural effusions needing interventional drainage) were also common triggers of unplanned escalation of care. The majority of patients subsequently returned to HITH for ongoing terlipressin post unplanned escalation of care, with cessation of terlipressin or transfer to a tertiary liver centre for ongoing management being the most common reasons to not return to HITH. The mean overall duration of in-hospital ward-based care was 44 days (including all subsequent unexpected returns to bed based care during HITH admissions), range 9 to 97 days of total duration of bed-based care. The mean duration of receipt of terlipressin on HITH was 129 days (range 21 to 380). No patients died during the study period.

There was a significant discrepancy in the frequency of gastroenterology reviews for patients under HITH, ranging from weekly to no clinic reviews at all (see [Table 2](#)). This discrepancy appears to be driven by patients in more recent years receiving regular reviews, as opposed to earlier in the service, when reviews were more likely to be infrequent. This change in review frequency did not appear to alter subsequent unplanned escalations of care, presumed to reflect the underlying severity of liver disease. Only face-to-face clinic reviews by the gastroenterology team were counted in this data.

DISCUSSION

This single-centre study from a regional hospital describes 9 patients who received terlipressin via HITH services for decompensated cirrhosis. We included all patients who received terlipressin from January 1st, 2020, until November 30th, 2025. Whilst there was a high unexpected escalation of care rate with each patient having at least one escalation of care, the majority of these were for complications related to the underlying liver disease, complications of peripheral access, or infectious complications. Given the 30-day readmission rate for patients with underlying cirrhotic liver disease in a retrospective study from a liver transplant centre was 46% with fluid overload and infection being amongst the most common reasons for return this same pattern being reflected in our cohort is in keeping with the published literature.¹² A minority of returns were due to terlipressin side effects, and the drug was discontinued due to adverse events in a minority of patients. Three patients were successfully bridged to liver transplantation at a tertiary institution.

In HITH settings unplanned escalations of care serve as key indicators of service delivery and response.¹³ Previous studies have suggested most HITH episodes (95.8%) are completed without interruption¹⁴ and a 6-7% escalation rate has been proposed as an acceptable HITH metric.¹³ Whilst our data may appear to run counter to this there is a suggestion in the literature that this is reflective of the underlying disease process itself. A Canadian study of risks for escalation of care in HITH patients noted cirrhosis as being a significant driver of risk, with a model of end stage liver disease (MELD) score of 20 or higher having a 49.8% risk of escalation.¹⁵ Exacerbation of the primary disease was noted as another common reason for escalation in a scoping review of 23 papers.¹⁶ Overall, this suggests that patients with cirrhosis on a HITH program have a high risk of escalation of care, a risk reflected in our case series.

The outcomes for terlipressin use in our study are similar to other described case series from tertiary institutions. Gow et al described 23 patients who received terlipressin through a tertiary institution HITH service of which 17 required terlipressin for refractory ascites, fourteen received a liver transplant, and the mean duration of terlipressin receipt was 50 days.⁹ Similar to our study, no significant adverse events were reported. Another study of 102 patients treated with terlipressin via a HITH service showed 49 treatment-related adverse events, of which 84% were re-

Table 1. Clinical Characteristics of the Patients at Baseline

Characteristic	Patients (N=9)
Mean age (range) – yr	55 (40-71)
Sex – No. (%)	
Male	4 (45%)
Female	5 (55%)
Cause of cirrhosis – no. (%)	
Autoimmune Hepatitis	4 (45%)
Alcohol use disorder	2 (22%)
Sarcoidosis	1 (11%)
Metabolic dysfunction associated steatohepatitis (MASH)	2 (22%)
Child Pugh Score – no. (%)	
A	0 (0%)
B	2 (22%)
C	7 (78%)
Cirrhosis complications during admission – no. (%)	
Variceal bleeding	6 (67%)
Hepatorenal syndrome	2 (22%)
Ascites	6 (67%)
Spontaneous bacterial peritonitis	2 (22%)
Hepatic hydrothorax	2 (22%)
Encephalopathy	2 (22%)
Terlipressin indication – no. (%)	
Variceal bleeding	1 (11%)
Hepatorenal syndrome	2 (22%)
Refractory fluid overload / ascites	5 (55%)
Hepatic hydrothorax	1 (11%)
Terlipressin dose (mg over 24-hour continuous infusion) – no. (%)	
1.7mg	1 (11%)
3.4mg	8 (89%)
Terlipressin side effects – no. (%)	
Abdominal pain	2 (22%)
Hyponatraemia	2 (22%)
Hypotension / volume depletion	1 (11%)
Comorbidities – no. (%)	
Chronic kidney disease	2 (22%)
Type 2 diabetes mellitus	4 (45%)
Hypertension	3 (33%)
Obstructive sleep apnoea	2 (22%)
Heart Failure / valvular heart disease	2 (22%)
Ischemic heart disease	1 (11%)
Atrial fibrillation	2 (22%)
Reason for terlipressin discontinuation – no. (%)	
Receipt of liver transplant	3 (33%)
Admission to tertiary liver centre	2 (22%)
Adverse effect of terlipressin	3 (33%)
Transjugular intrahepatic portosystemic shunt placement	1 (11%)
Balloon-occluded retrograde transvenous obliteration procedure	1 (11%)
Reason for unplanned escalation of care – no. (%)	
Electrolyte abnormality	2 (22%)
Variceal bleeding	4 (45%)
Pain	3 (33%)
Fluid overload	2 (22%)
Encephalopathy	3 (33%)
Peripherally inserted central venous catheter complication	5 (55%)
Sepsis/infection	6 (65%)
Acute kidney injury	1 (11%)

Table 2. Frequency of Gastroenterology Reviews and Unplanned Escalation of Care.

Patient	Days on HITH in the community	Days in bed-based care (cumulative no. and individual admissions sequentially (no.))	Gastroenterology HITH clinic reviews			Unplanned escalation of care		
			Routine	As required	Frequency (days)	Gastroenterological issue	Non-gastroenterological issue	Frequency (days)
A	189	37 (6, 4, 1, 4, 10 and 12)	7	0	27	4	1	37.80
B	100	90 (82, 5 and 3)	4	0	25	2	1	33.33
C	21	30 (27, 1, 1 and 2)	3	0	7	1	2	7
D	207	33 (4, 7, 3, 1, 10 and 8)	11	1	17.25	1	3	51.75
E	119	9 (2, 4 and 3)	4	0	29.75	0	2	29.75
F	21	97 (70, 5 and 22)	1	0	21	2	0	10.5
G	77	16 (2,2,3 and 9)	0	0	0	2	1	25.67
H	380	52 (25, 4, 2, 9, 5 and 7)	0	0	0	3	0	126.67
I	55	33 (31 and 2)	0	0	0	0	1	55

lated to central line complications,¹¹ with no events necessitating cessation of terlipressin. Another study also noted low rates of hyponatraemia despite long term receipt of continuous terlipressin via a HITH service.¹⁷ Line-related complications (7 events) were the main adverse event noted in a trial of home-based terlipressin infusion that examined hand grip strength, paracentesis rate and quality of life scores in 30 patients.¹⁸ This pattern of adverse events broadly mirrors that which was noted in our study.

Patients who received terlipressin in our cohort had prolonged HITH admissions, with the mean duration of receipt of terlipressin on HITH being 129 days (range 21 to 380). This should be contrasted against the duration of their ward based in hospital stays, with the mean duration spent in bed-based care (including all unexpected returns to bed based care during HITH admissions) of 44 days (range 9 to 97 total bed-based days). It is also important to note that once patients were transferred to a HITH service, the longest duration of return to bed-based care before being transferred back to HITH for ongoing terlipressin was 12 days, with the longest bed-based hospital stays (82 and 70 days respectively) being up-front admissions before initial HITH transfer. Overall, these significant differences in time between bed-based and HITH based care highlight the potential benefits of managing these prolonged infusions in a community setting including patient comfort, overall well-being, and reduction of resource utilisation on admitted in-patient based hospital services.

There are several strengths to our study. Our study captured all patients in a major regional hospital within a 5-year period and describes the use of a novel therapy within a HITH space which would typically be otherwise reserved for tertiary centres with a liver transplant service. Our HITH service liaised closely with both local and tertiary hepatology teams in managing the patients in our cohort and successfully bridged 3 patients to liver transplantation via a continuous home infusion of terlipressin. Patterns of reasons for unexpected escalations of care and return to bed-based services were captured. This is an evolving metric for service delivery and outcomes within a HITH service

which has not been previously well described for this patient cohort.

Our study also has several notable limitations. It is a single-centre trial in a regional centre, which may limit generalisability to other settings. Several patients ended their HITH care upon transfer to a tertiary hospital for further management, resulting in potentially incomplete documentation of their outcomes. Our sample size is also small and the data presented is retrospective yet captures real world experience by incorporating every patient to receive terlipressin via HITH in our centre for the past 5 years. This experience of terlipressin within a regional setting resembles the experience of that in tertiary centres and suggests that terlipressin can be safely administered in a HITH setting, although such patients are at high risk for unexpected escalation of care due to the nature of their underlying disease. This suggests that the use of terlipressin in HITH services under the guidance of a tertiary centre could be expanded and allow more patients access to this therapy as a potential bridge to liver transplantation.

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DATA SHARING

All authors had full access to all the data related to the study. The study data can be accessed by contacting the corresponding author.

CONFLICTS OF INTEREST

The authors have no conflicts of interest to disclose.

AUTHOR CONTRIBUTIONS

Writing – original draft: Justin Davis (Lead). Conceptualization: Justin Davis (Lead). Data curation: Justin Davis (Lead). Writing – review & editing: Alicia Abbas (Supporting), Sahan Withanage (Supporting), Sumaya Alukaidey (Supporting). Formal Analysis: Sahan Withanage (Supporting).

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