ISSN 2515-8260 Volume 09, Issue 03, 2022

TERLIPRESSIN'S EFFECT ON HEPATORENAL DISEASE: AN OBSERVATIONAL, DESCRIPTIVE, CROSS-SECTIONAL STUDY

Dr. Nitin N. Jadhav 1 Dr.Mrs. Patange Aparna P2 . Associate Prof , Dr. Virendra C. Patil 3, Prof.Department of Medicine , Krishna Institute of Medical Sciences, Krishna Institute of Medical Sciences Deemed to be University ,Karad

Email : nitinjadhavn@yahoo.com

ABSTRACT

With the help of clinical and biochemical tests, we will evaluate the relative benefits of Terlipressin in combination with albumin against albumin alone for treating hepatorenal syndrome. The eighty patients were divided evenly. Albumin was the sole treatment for Group 1, whereas Terlipressin was added to the mix for Group 2. The information was analysed with IBM SPSS 20. The tables were made using a combination of a frequency distribution and a cross-tabulation. The data is presented with a mean, standard deviation, and median (minimum–maximum). Student's t and Mann–Whitney tests were employed to compare continuous variables. "Analyzing categorical data with the Pearson Chi square and Fisher's exact test Less than 0.05 was considered statistically significant. The non-significant p value of 0.79 reveals no difference in etiology distribution between treatments. With the exception of SGOT ($p = 0.002$), which was lower in the Terlipressin + albumin treatment group (61.89± 47.83) than albumin alone, total bilirubin, SGPT, INR, and serum albumin were all the same in both groups (96.80±109.30). Terlipressin and albumin reduced serum creatinine. Serum creatinine dropped 50.14 percent (1.73 ± 1.49) from day 1 (3.47 ±1.68) to day 5. Albumin patients fell 9.33%. Serum creatinine decreased in the albumin group ($p = 0.237$)". Every measure, with the

exception of SGOT, which was much lower in the Terlipressin plus albumin treatment group and may indicate a better safety profile, was equivalent in both groups, including total bilirubin, SGPT, INR, and serum albumin. Blood creatinine levels upon admission and on day five revealed that patients who took Terlipressin with albumin fared better in terms of their health and biochemistry.

KEYWORDS: Terlipressin, Albumin, Creatinine, Serum Glutamic Pyruvate Transaminase, International Normalized Ratio, Serum Glutamate Oxaloacetate Transaminase.

INTRODUCTION

One of the many issues that might arise in patients with cirrhosis is the emergence of hepatorenal syndrome. Both the course and the outcome of this illness are quite harmful. The illness is normally curable and occasionally even reversible because HRS is typically an extended spectrum of prerenal azotemia. However, if the illness has advanced, the median survival period for a patient without a liver transplant or vasoconstrictor therapy is only two weeks.[1]

Typically, HRS cannot be identified until blood urea nitrogen and serum creatinine levels rise. The illness had already progressed to the point where it was terminal and had a poor outlook at that time. However, the condition can be anticipated using Doppler ultrasound to estimate the renal resistive index, which rises before a significant amount of time. As a result, actions can be taken to stop the disease's progression. These precautions include refraining from overusing nephrotoxic drugs and diuretics, avoiding large-volume paracentesis, and others. In addition to medical care, potential treatments for renal failure include the management of portal hypertension, liver transplantation, kidney transplantation into a recipient without cirrhosis, and liver transplantation.[2]

The cause of HRS is a considerable vasoconstriction of the renal circulation, which lowers glomerular filtration rate and renal blood flow noticeably. HRS eventually results from this. In all attempts to produce renal vasodilatation, the injection of vasodilator drugs has failed.

However, due to the studies' retrospective nature, small patient populations, or lack of randomization, the information supplied is constrained. Because of this, we tried to determine in the study we are currently conducting how terlipressin affects renal function and how likely it is that persons with cirrhosis and HRS will survive.

AIM

Patients with hepatorenal syndrome will undergo a series of clinical and biochemical tests to compare the efficacy and outcomes of Terlipress in combination with albumin to those of albumin alone.

SOURCE OF SAMPLE: This was a hospital-based study conducted at a single location with patients who had been admitted to the Intensive Care Unit (ICU).

INCLUSIONCRITERIA

MAJORCRITERIA

i. “Chronicoracuteliverdiseasewithadvancedhepaticfailureandportalhypertension.

ii. Low GFR as indicated by serum creatinine > 1.5 mg/dL or 24 hr. creatinine clearance < 40 mL/min.

iii. Absence of shock, on-going bacterial infection, and current or recent treatment with nephrotoxic drugs and absence of gastrointestinal fluid losses (repeated vomiting orintense diarrhea).

iv. No sustained improvement in renal function (decrease in serum creatinine

≤1.5 mg/dLorincreaseincreatinineclearanceto≥40 mL/min) following diuretic withdrawal for 48 hrs. and expansion of plasma volume with 1.5 L of isotonic saline.

v. Nosonographicevidenceofobstructiveuropathyorparenchymalrenaldisease".

ADDITIONALCRITERIA

1. Serum sodium<130 mEq/L
2. Cirrhosis with ascites
3. Serum creatinine >133 μmol/L (1.5 mg/dL)
4. No current or recent treatment with nephro toxic drugs

EXCLUSIONCRITERIA

The exclusion criteria were as follows:

The presence of a severe extrahepatic disorder, such as cardiovascular (coronary and/or peripheral artery disease), neurological, hematologic, or hepatocellular malignancy.

STUDY DESIGN: This was an observational and descriptive study that used a cross-sectional design.

STUDY PERIOD: The current study was carried out over the course of 18 months, beginning in October 2019 and ending in March 2021.

MATERIAL& METHOD

The eighty patients were split evenly between two groups. The first group received simply albumin, while the second group received both Terlipressin and albumin.

SAMPLE SIZE: A total of 80 people with Hepatorenal Syndrome were studied.

STASTICAL ANALYSIS

IBM SPSS 20 (a social science statistics package) was used for all data analysis. Both a frequency distribution and a cross tabulation were performed in order to get the tables ready. The median, mean, and standard deviation (SD) of the results are presented (minimum – maximum). Data analysis and comparison of continuous variables were performed using both the Student's t test and the Mann-Whitney U test. Categorical data was examined using both the Pearson Chi square test and the Fisher's exact test. The threshold for statistical significance was set at p0.05.

RESULT

STUDY OF DISTRIBUTION OF ETIOLOGY BETWEEN THE STUDY GROUPS**.**

In this study, alcohol use was identified as the leading contributor (n = 71). The primary finding—that there was no discernible variation in aetiology distribution between treatments—was supported by a p value of 0.79, which is not statistically significant.

Etiology	Treatment		Total	P value
	Albumin	Terlipressin +Albumin		
Alcohol	35	36	71	0.79
Ca pancreas	1	0	1	
Cryptogenic	3	3	6	
Hepatitis B	1	1	2	
Grand Total	40	40	80	

Table 1: Study of Distribution of Etiology Between the Study Group

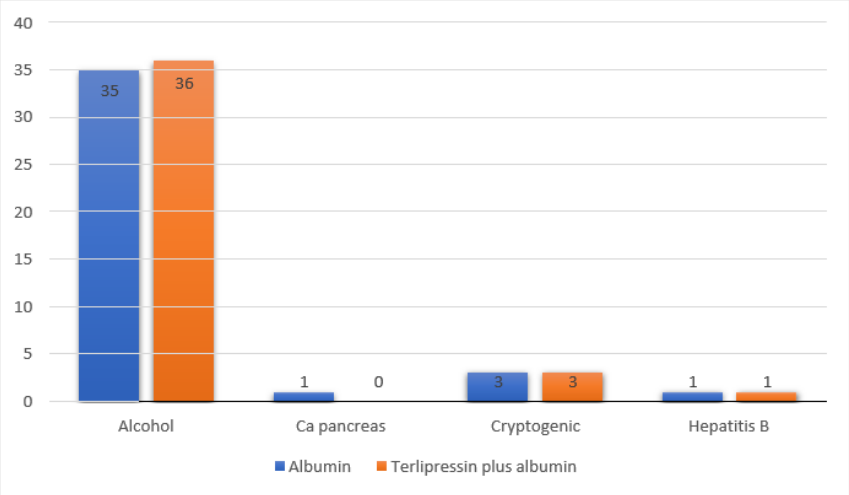

Figure 1: Study of Distribution of Etiology Between Two Groups

STUDY OF COMPARISON BETWEEN LFT PARAMETERS BETWEEN TWO GROUPS.

In the current study, "all of the parameters, including total bilirubin, SGPT, INR, and Sr. albumin, were discovered to be the same in both groups, with the exception of SGOT (p = 0.002), which was discovered to be significantly lower in the Terlipressin + albumin treatment group (61.89 ±47.83) in comparison to only albumin (96.80±109.30)".

Parameters	Treatment		Total	P value
	Albumin	Terlipressin +Albumin		
Total Bilirubin.	11.41±8.77	12.28±10.10	11.79±9.33	0.482
SGOT	96.80±109.30	61.89±47.83	81.53±89.12	0.002
SGPT	56.47±33.50	58.54±78.28	57.38±45.23	0.321
INR	2.34±0.51	2.59±0.67	2.45±0.59	0.631
Serum Albumin	2.47±0.53	2.37±0.74	2.43±0.63	0.246

Table 2: Study of Comparison between LFT parameters between two groups

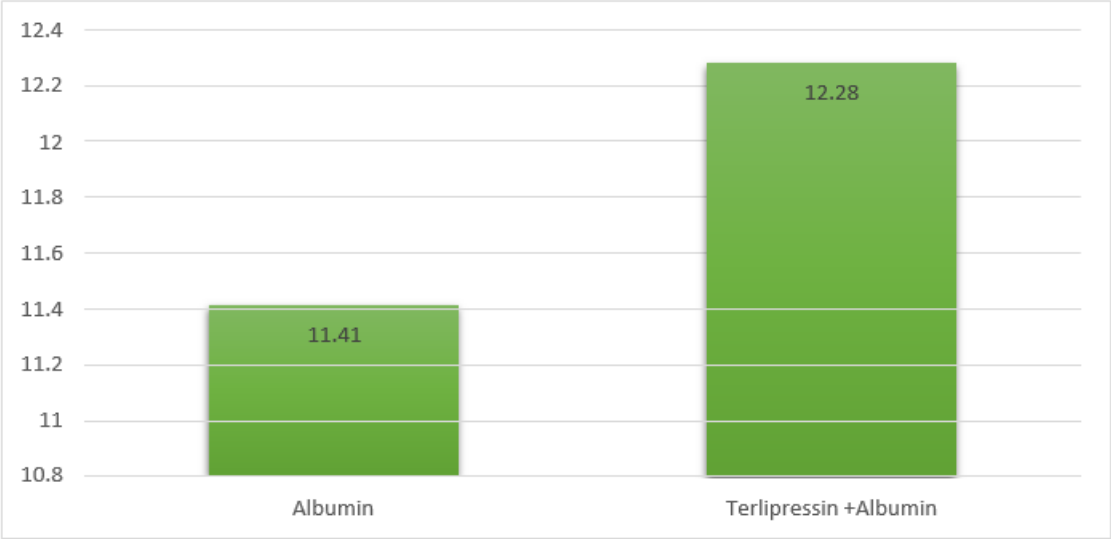

Figure 2: Total Bilirubin

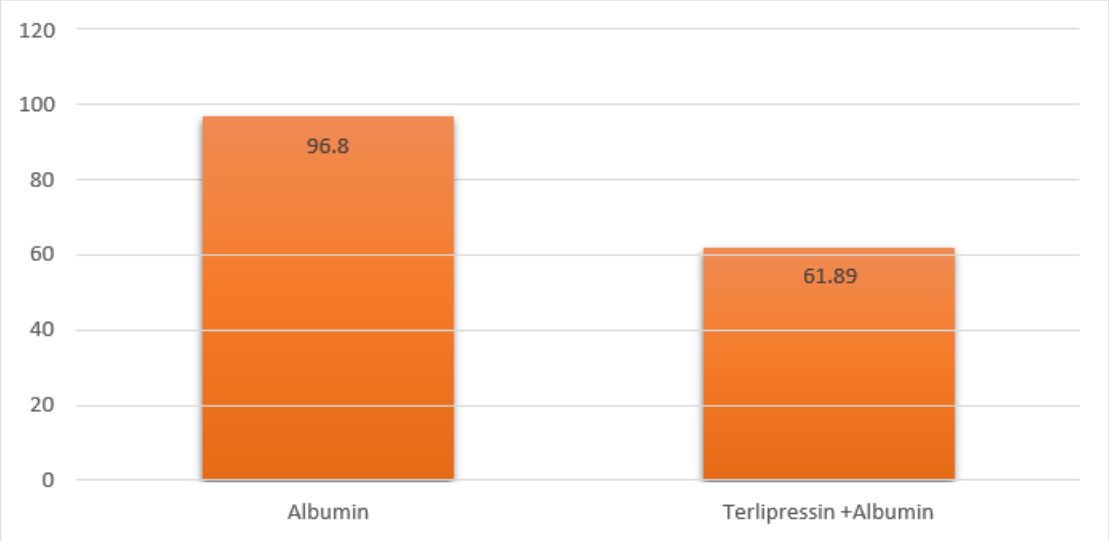

Figure 3: Serum Glutamate Oxaloacetate Transaminase

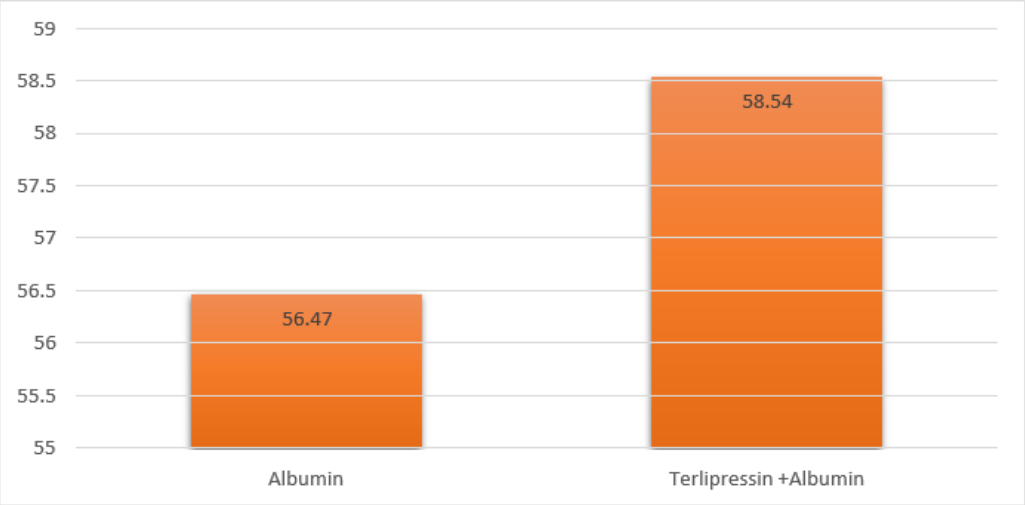

Figure 4: Serum Glutamic Pyruvate Transaminase

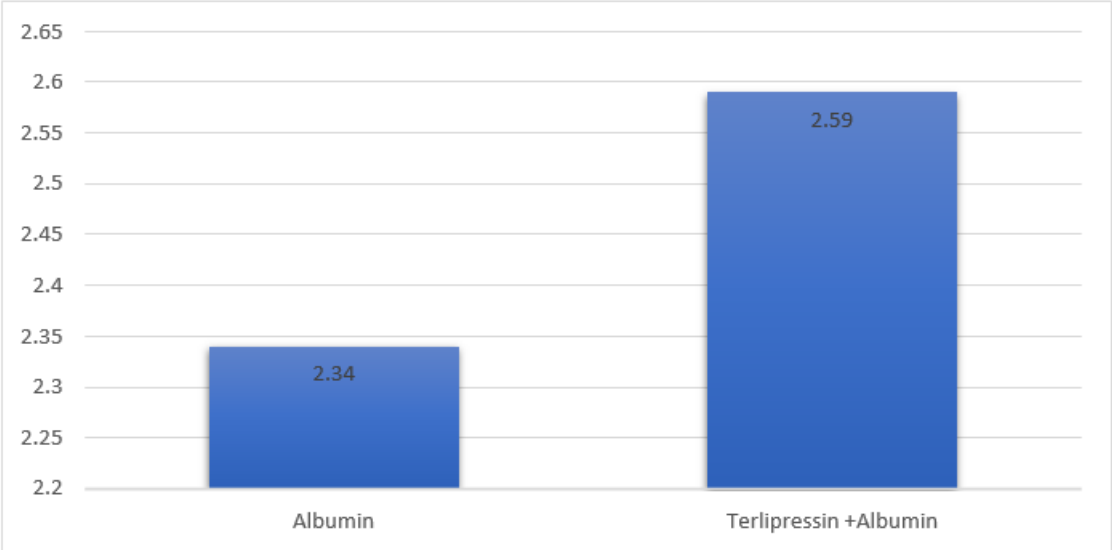

Figure 5: International Normalized Ratio

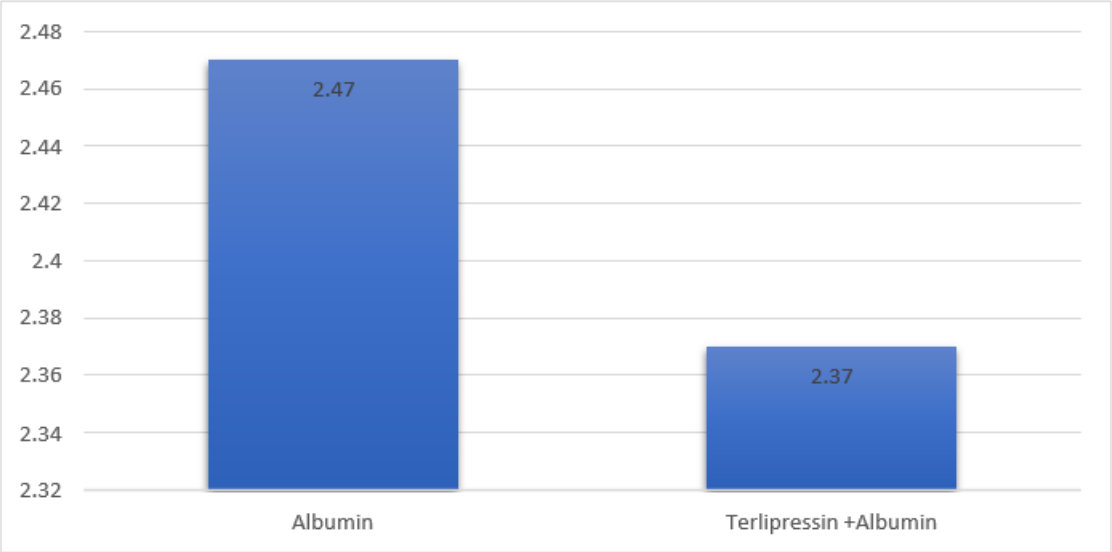

Figure 6: Serum Albumin

STUDY OF COMPARISON BETWEEN SERUM CREATIN IN ELEVELS IN BOTH THE GROUPS.

In the current investigation, participants whose serum creatinine levels were reduced by treatment with a combination of Terlipressin and albumin exhibited statistically significant improvement. On day 5, "the serum creatinine level was found to have significantly decreased from day 1 levels (3.47 ±1.68) to day 5 levels (1.73 ±1.49), resulting in a percentage decrease of 50.14%. In contrast, only a drop of 9.33% was seen in the group that was given albumin. In addition, a p value of 0.237 indicates that the decrease in serum creatinine seen in the albumin group was not significant".

Timeline	Treatment		Total	P value
	Albumin	Terlipressin +Albumin		
Day 1	3.88±2.46	3.47±1.68	3.70±2.15	0.582
Day 2	3.52±2.17	2.93±1.37	3.25±1.87	0.024
Day 3	3.57±2.49	2.44±1.30	3.08±2.12	0.031
Day 4	3.61±2.55	2.12±1.51	2.96±2.27	0.023
Day 5	3.51±2.41	1.73±1.49	2.73±2.23	0.001
% Decrease from Day 1	9.53	50.14		
P value	0.237	<0.001		

Table 3: Study of Comparison Between Serum Creatinine Levelsin Both the Groups.

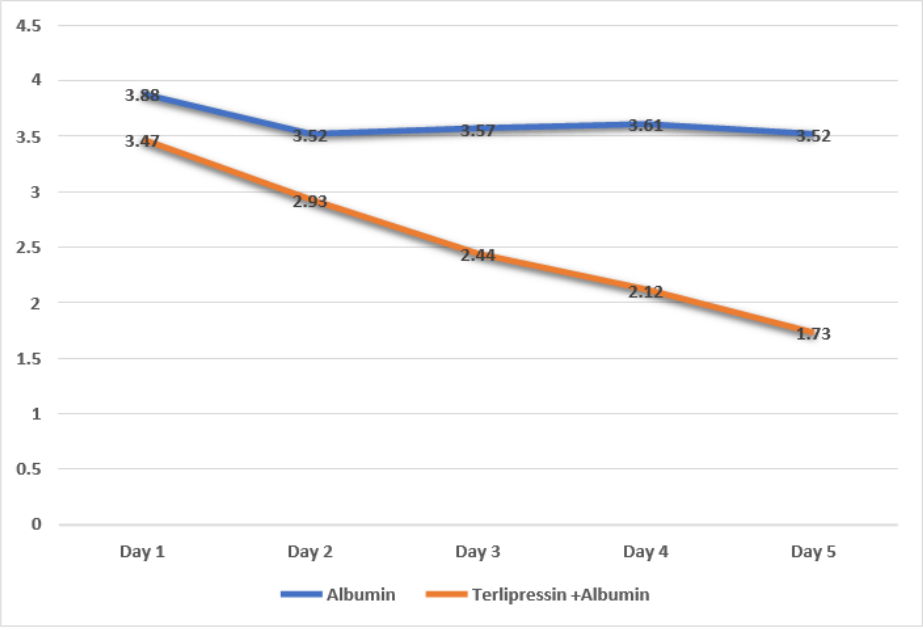

Figure 7: Comparing Serum Creatinine

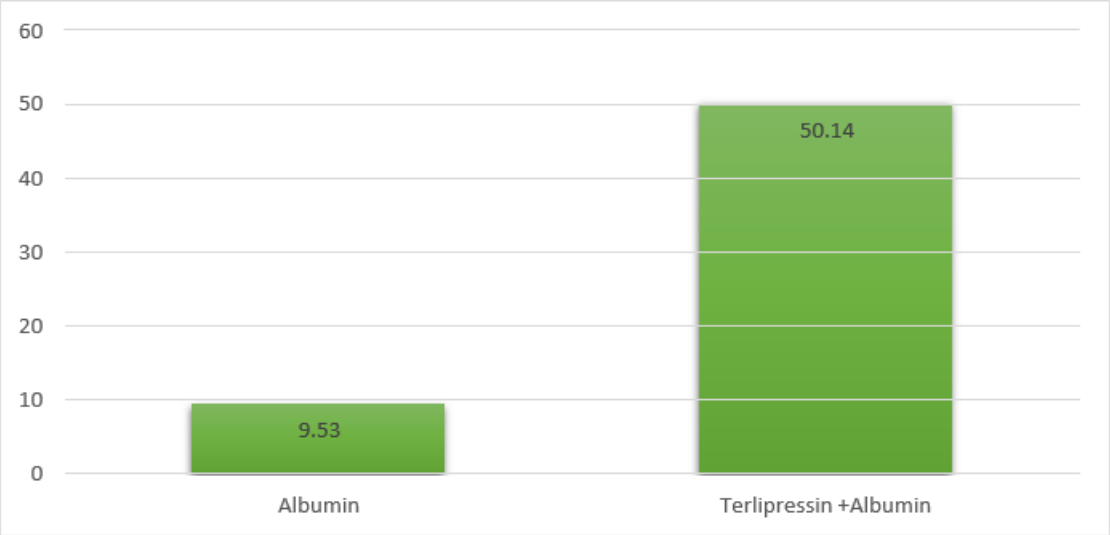

Figure 8: Mean Percentage Decrease of Serum Creatinine from Day of Admission and on 5th Day.

DISCUSSION

"Hepatorenal syndrome (HRS) is one of the worst outcomes of advanced liver disease, and acute kidney injury, especially hepatorenal syndrome type 1 (HRS-1), is a powerful predictor of death risk in patients with cirrhosis. It has been demonstrated that terlipressin, a synthetic vasopressin analogue, has vasoconstrictor effects in both the splanchnic and systemic vasculature".

Because of this process, hypertension in the portal system is alleviated and blood flow through the portal veins is decreased. This is the main reason why advanced cirrhosis causes blood flow problems. The subsequent redistribution of blood volume improves systemic hemodynamics by increasing renal perfusion pressure and diverting blood flow from the splanchnic to the systemic circulation.

In addition, the enhanced renal hemodynamics is a result of the lower compensatory renal and systemic vasoconstrictor activities caused by the elevated effective arterial volume. Patients

with HRS-1 have been the subject of a variety of studies looking into the efficacy and safety of terlipressin in randomised, multicenter, placebo-controlled trials with varied sample sizes. Patients with hepato-renal syndrome were compared between two treatment groups: albumin only and albumin with terlipressin. Patients admitted to our hospital's Intensive Care Unit (ICU) between October 2019 and March 2021 were the subjects of a descriptive and observational cross-sectional study.

In the current study, we looked at the distribution of etiology between two different groups. In the current investigation, alcohol use was the most common cause (n = 71). The non-significant p value of 0.79 reveals that there was not a significant difference found between the two groups in terms of the distribution of etiology.

In the current study, serum creatinine dropped a lot in the people who got Terlipressin and Albumin. On Day 5, "serum creatinine was much lower (1.73±1.49) than on Day 1 (3.47±1.68), representing a 50.14% decrease. In the albumin group, however, just a 9.53% decrease was recorded. Furthermore, with a p value of 0. 237, the drop in serum creatinine in the albumin group was negligible. The current study's findings were comparable to those of Martn-Llah M et alwho showed that in patients who responded to terlipressin and albumin treatment, serum creatinine dropped from 256 71 to 115 18 micromol/L (P =.005) and mean arterial pressure raised from 75 13 to 84 18 mm Hg (P =.02). There were no significant changes in these parameters in patients who did not respond to terlipressin or albumin treatment (362 195 vs 433 248 micromol/L and 68 10 vs 69 12 mm Hg, respectively; P = ns for both).[10] Similarly, Neri S et al. observed that patients treated with terlipressin plus albumin showed a significant improvement in renal function as measured by creatinine (from 248 96 to 112 32 lmol/l) compared with patients treated with albumin alone (from 256 104 to 188 43 lmol/l); changes of serum creatinine were significantly different (p = 0.001) between the two groups, with worse values in patients treated with albumin alone (p = 0.001)".[13]

In the current trial, "60% of patients receiving Terlipressin plus albumin had a complete response, while 40% had no response. The majority of those receiving albumin alone had no

response (85%), and only 15% had a complete response to therapy. With a p value of 0.000032, the comparison was determined to be significant. The current study's findings were comparable to those of Martn-Llah M et al. who showed that renal function improved in 43.5% of patients treated with terlipressin and albumin compared to just 8.7% of control patients treated with albumin alone (P =.017).[10] Similarly, Neri S et al. found that in group A, 21 patients (80%) had a complete response to terlipressin with albumin therapy, four (15%) had a partial reaction, and one had no response. In group B, five patients (19%) had a complete response to albumin-only therapy, 11 (16%) had a partial response, and ten (30%) had no response. These findings were consistent with the outcomes of our investigation".[13]

CONCLUSION

"Total bilirubin, serum glutamic pyruvate transaminase, international normalised ratio, and serum albumin were all found to be comparable in both groups; however, SGOT was found to be significantly lower in the Terlipressin plus albumin treatment group, which may suggest a better safety profile. Terlipressin plus albumin had a better clinical and biochemical outcome, as shown by a statistically significant difference in blood creatinine levels between the two groups on admission and again on day five of treatment".

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