

INTRODUCTION

Chronic hepatitis B (CHB) infection is a nationwide public health concern, affecting more than 8% of the Vietnamese population [1]. Acute-on-chronic liver failure (ACLF) in CHB patients, most commonly caused by acute severe exacerbation of CHB, is a distinct clinical entity with extremely high morbidity and mortality rate [2] (figure 1). Studies of acute-on-chronic liver failure have shown that systemic inflammation correlates directly with the severity of the syndrome [3]. Therapeutic plasma exchange (TPE) has been proven to be effective as a bridging therapy to liver transplantation or in promoting spontaneous recovery in ACLF, however, data is scarce [4][5]. Its proposal mechanism is removal of plasma cytokines and drivers of systemic inflammatory cascade through plasma exchange (figure 2). We conducted this study to investigate the clinical characteristics, outcomes at 90 days, and predictors of successful TPE in hepatitis B flares associated with ACLF patients

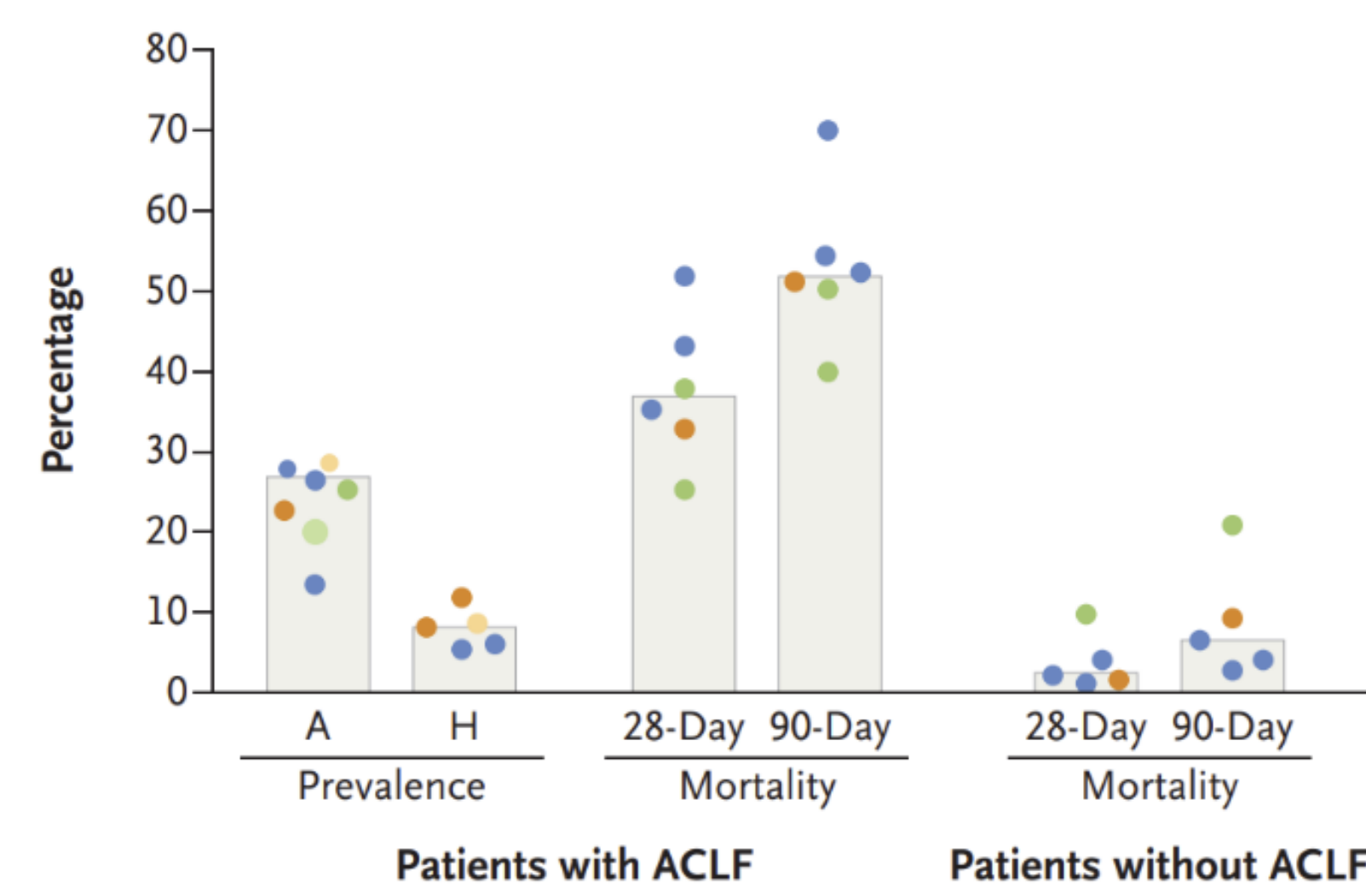
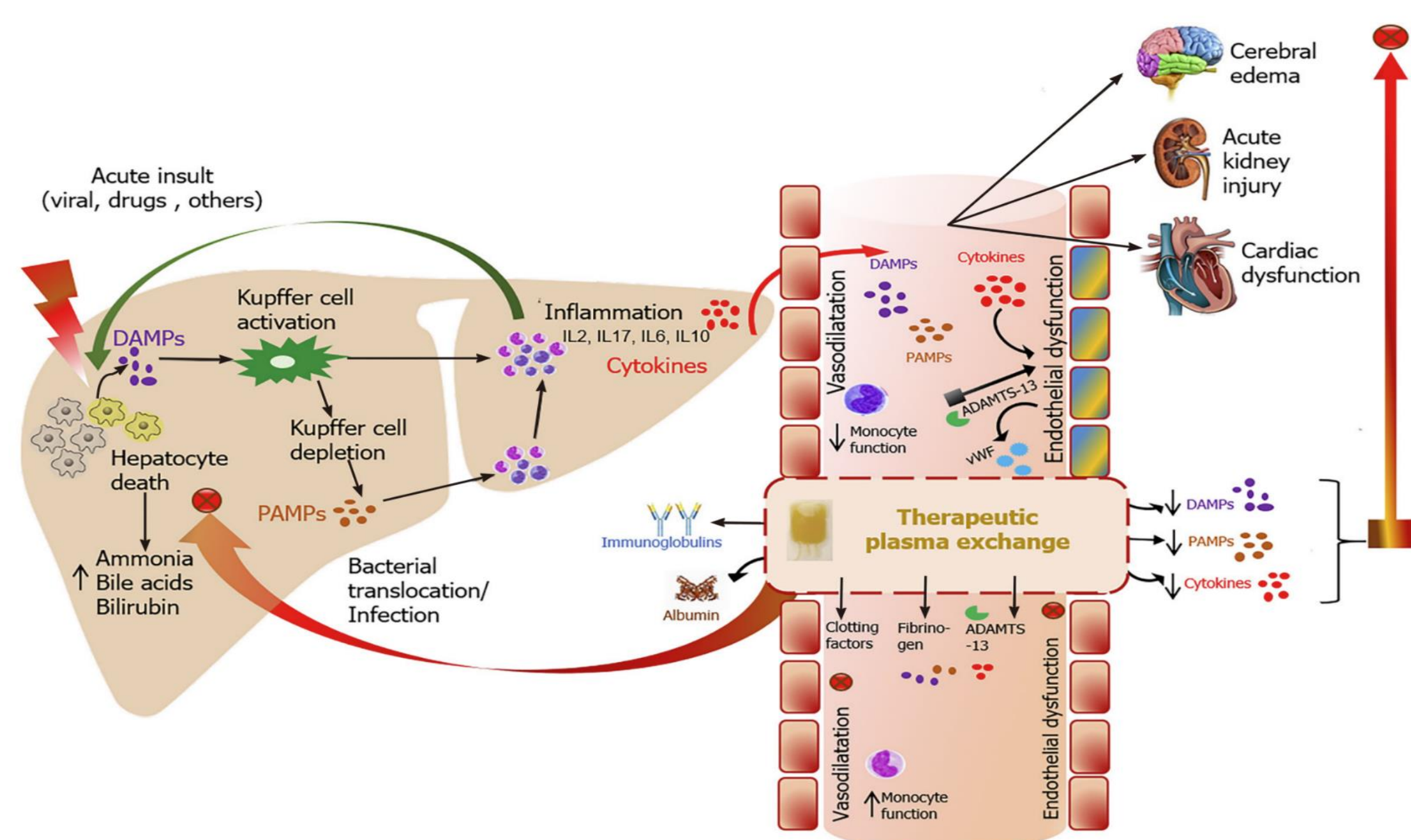


Figure 1

Therapeutic plasma exchange (TPE) has been proven to be effective as a bridging therapy to liver transplantation or in promoting spontaneous recovery in ACLF, however, data is scarce [4][5]. Its proposal mechanism is removal of plasma cytokines and drivers of systemic inflammatory cascade through plasma exchange (figure 2). We conducted this study to investigate the clinical characteristics, outcomes at 90 days, and predictors of successful TPE in hepatitis B flares associated with ACLF patients

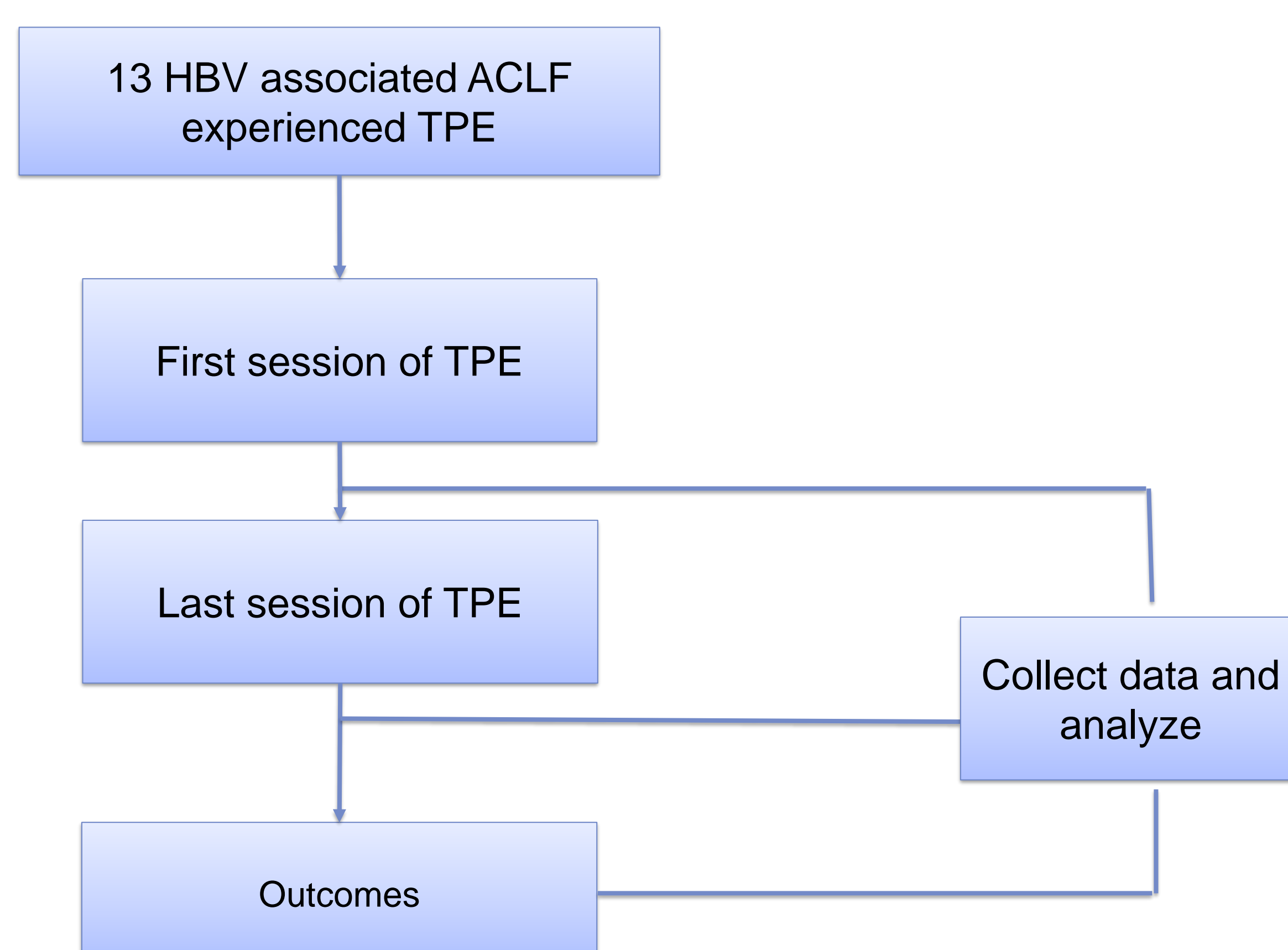


PAMPs: Pathogen-associated molecular patterns
DAMPs: Damage-associated molecular patterns

Figure 2

MATERIALS AND METHODS

From October 2021 to March 2022, a total of 13 patients who experienced TPE for hepatitis B flares associated with ACLF were enrolled. ACLF was diagnosed based on APASL criteria. All of the patients were followed up for greater than 90 days. The non-response group includes patients who died within 90 days whereas patients who survived without liver transplantation after day 90 were response group. Laboratory data, AARC score, MELD, and MELD-Na score differences before and after the first TPE session were analyzed by Wilcoxon signed rank test in each group



The indication of TPE depended on the clinical manifestations and laboratory data at each time point.

RESULTS

Table 1: Baseline characteristics of participants

Characteristics	Statistics*
Age (years)	58.54 ± 7.89
Male: Female ratio	2.25:1
The duration of treatment (days)	16.85 ± 9.01
BMI (kg/m ²)	24.60 ± 4.74
Hepatic encephalopathy grade	3/4/2/3/1
AST (U/L)	356.15 ± 358.60
ALT (U/L)	281.77 ± 231.97
Total bilirubin (mg/dL)	31.59 ± 7.17
WBC (G/L)	9.3 ± 3.36
Hgb (g/L)	124.62 ± 20.69
Platelet (10 ⁹ /L)	116.68 ± 44.67
INR	2.58 ± 1.15
HBV DNA (IU/mL)	8.52E7 ± 2.06E8
Serum creatinine (mg/dL)	1.05 ± 0.52
Serum sodium (mmol/L)	131.38 ± 6.74
Lactate (mmol/L)	1.49 ± 0.69
Amoniac (umol/L)	93.9 ± 54.1
MELD score	30.15 ± 5.24
MELD-Na Score	31.69 ± 4.82
AARC score	10.23 ± 1.74
Number of TPE sessions per patient	2.69 ± 1.49
Died within 30 days	4 (30.77%)
Died from 30 to 90 days	4 (30.77%)
Survived after 90 days	5 (38.46%)

* Mean ± SD for continuous variable and count (%) for categorical variables

Table 2: The difference in laboratory data before and after TPE

Parameters	Before TPE	After last session of TPE	P value (**)
Total bilirubin	31.59 ± 7.17	18.44 ± 7.4	0.0005
AST (IU/L)	356.15 ± 358.6	176.23 ± 164.85	0.023
ALT (IU/L)	281.77 ± 231.97	106.15 ± 88.4	0.0035
Sodium (mmol/L)	131.38 ± 6.74	136 ± 4.58	0.013

** Mann-Whitney U test

Table 3: The change in laboratory data after 1st TPE session in response group (transplant-free survival after 90 days)

Parameters	Before TPE	After first session of TPE	P value (***)
Total bilirubin	30.47 ± 8.59	12.94 ± 4.63	0.008
MELD score	29 ± 2.92	21.6 ± 1.95	0.011
MELD-Na score	30.8 ± 1.79	23.4 ± 3.65	0.012
AARC score	9.6 ± 0.89	6.4 ± 0.89	0.01

*** Wilcoxon signed rank test

CONCLUSION

Plasma exchange could be an effective treatment for patients with HBV flares associated with ACLF by improving biochemical tests and proceeding to spontaneous recovery. After the first session of TPE, the decline in total bilirubin, MELD score, MELD-Na score, and AARC score may play a role in predicting survival at 90 days

References

1. Global Hepatitis report 2017.
2. Gustot T, Fernandez J, Garcia E, et al. Clinical Course of acute-on-chronic liver failure syndrome and effects on prognosis. *Hepatology* 2015;62:243-52.
3. Clària J, Stauber RE, Coenraad MJ, et al. Systemic inflammation in decompensated cirrhosis: characterization and role in acute-on-chronic liver failure. *Hepatology* 2016;64:1249-644.
4. Maiwall R et al. Therapeutic plasma-exchange improves systemic inflammation and survival in acute-on-chronic liver failure: A propensity-score matched study from AARC. *Liver Int.* 2021 May;41(5):1083-1096
5. Ocskay K et al. Uncertainty in the impact of liver support systems in acute-on-chronic liver failure: a systematic review and network meta-analysis. *Ann Intensive Care.* 2021 Jan 18;11(1):10.

Acknowledgements

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