Early change in organ failure scores predicts survival in acute on chronic liver failure

Sreelakshmi Kotha[1], Alexandra Zirra[1], Andrew Jones[2], Philip Berry[1]

1) Department of Gastroenterology, Guy's and St Thomas' Foundation Trust, London, United Kingdom
2) Department of Critical care, Guy's and St Thomas' Foundation Trust, London, United Kingdom

PRESENTER DECLARATIONS
this presenter has the following declarations: none

Background

- Acute-on-chronic liver failure (ACLF) is characterised by acute decompensation of cirrhosis, organ failure, and high short term mortality[1].
- Identification of patients with ACLF who will benefit from ongoing support on intensive care unit (ICU) remains a challenge.
- There is no agreed marker of futility or time-point.
- There has been recent consensus regarding the definition of ACLF grades, and chronic liver failure-sequential organ failure assessment(CLIF-SOFA) score has been adopted[2].

Aim

- To determine if evolution in CLIF-SOFA or other markers of disease severity can predict mortality and survival in ACLF patients admitted to ICU.

Methods

Prospectively recorded data
- 120 cirrhosis patients admitted to ICU May 2013 – May 2016

Inclusion/ exclusion
- 48 patients with ACLF ≥ 1
- 52 excluded as ACLF = 0

D0, D2, D5, D7
- MELD, UKELD, Child-Pugh, ACLF and CLIF-SOFA scores
- Individual scores
- Evolution of scores (differences = Δ)

Statistical analysis
- Prediction of mortality at 90 days (Chi-square, T-test)
- ROC curves
- Survival analysis

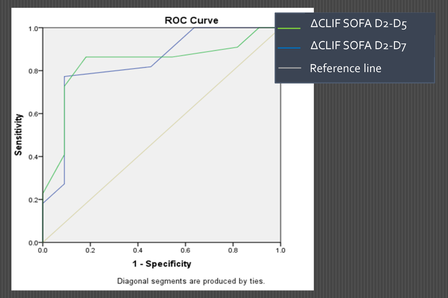
Results

- A total of 120 patients were identified and 48 patients with ACLF ≥ 1 were included.
- Mortality at 7, 28 and 90 days was 16/48(33.3%), 30/48(62.5%), 36/48(75%).
- The best predictive model proved to be difference in CLIF-SOFA ('delta C-SOFA') scores between D2 and D5 or D7 .
- Mean delta C-SOFA D2-D5 was -2.25+/-1.9 and mean delta C-SOFA D2-D7 was -3.36+/-2 for survivors compared to 0.19+/-1.73(p<0.001) and 0+/-2.58(p=0.001) for deceased at 90 days, with area under curve(AUC) of 0.839 and 0.835, respectively.
- Other prognostic scores at a single time point on D7 predicted survival at D28 and D90 with AUC of: CP (0.75/0.67), MELD (0.73/0.79), UKELD (0.79/0.84), ACLF (0.75/0.78) and CLIF-SOFA (0.75/0.83).

Demographics		n = 48
Age (mean+/- SD)		57.4 +/- 10.3
Gender male %		70.1%
Etiology* n (%)	Alcohol	34 (70.1%)
	Viral hepatitis	11 (22.9%)
	Other	3 (7%)
Reason for ITU admission** n (%)	Infection (+)	29 (60.5%)
	GI bleed (+)	11 (22.9%)
	Hepatic encephalopathy (+)	5 (9.5%)
	Multi-organ failure	3 (7%)

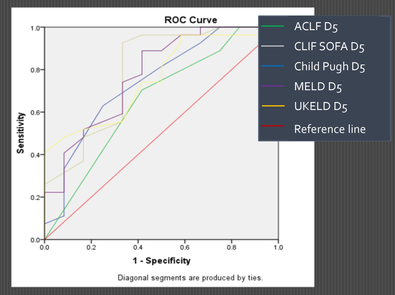
90 day survival is predicted best by Δ CLIF-SOFA D5-D2 and D7-D2

Delta SOFA D5_D2 and D7_D2



AUC 0.839 ΔCLIF SOFA D2 to D5
AUC 0.835 ΔCLIF SOFA D2 to D7

Survival D 90

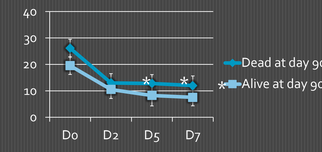


AUC for individual scores at D5 < 0.8

- 90D survival analysis shows that the AUCs for ΔCLIF SOFA D2-D5 and ΔCLIF SOFA D2-D7 (0.839 and 0.835) are better than for all the individual scores at D5 (ACLF D5 0.75, CLIF SOFA D5 0.75, CP D5, MELD D5 0.73, UKELD D5 0.79)

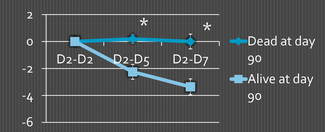
Evolution of CLIF -SOFA scores are important at predicting mortality at 90 days

CLIF-SOFA scores



CLIF-SOFA scores are significantly different at D2, D5 and D7 for survivors vs deceased at 90 days post ICU admission (p<0.05)

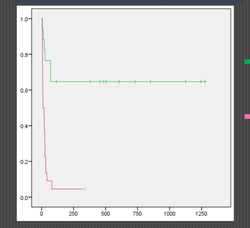
CLIF-SOFA score evolution



CLIF-SOFA scores improve significantly for survivors and worsen / stagnate for deceased at 90 days post ICU admission (p<0.01)

Mean survival time is similar for evolution of scores at D5 and D7

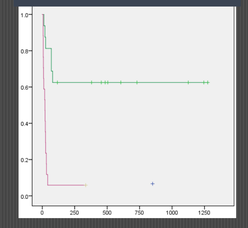
ΔCLIF-SOFA D2-D5



Improvement

Worsening/ no improvement

ΔCLIF-SOFA D2-D7



Survival	Improvement	n	Worsening / no improvement	n	P value
ΔCLIF SOFA D2-D5	837.1 (+/- 143.9)	12	33.8 (+/- 14.5)	36	.000
ΔCLIF SOFA D2-D7	814.4 (+/- 148.7)	12	37.6 (+/-18.2)	36	.000
P value	0.7		0.33		

- The mean survival time for patients who had an improvement in CLIF SOFA from D2 to D5 and from D2 to D7 (837, 814.4) greatly exceeds the survival for patients with worsening/no improvement in scores from D2 to D5 and from D2 to D7 (33.8, 37.6) – p value < 0.000.
- There is no statistical difference in the improvement groups at D5 and D7 (837.1 vs 814.4, p = 0.7) or between the worsening/no improvement groups at D5 and D 7 (33.8 vs 37.6, p = 0.33)

Conclusions

- The evolution in CLIF-SOFA score between D2 and D5/7 is superior to evolution in other scores and scores assessed at single time points when predicting 90-day survival.
- The delta C-SOFA at D5 and D7 are comparable, thus further research into utility of delta C-SOFA D2-D5 to guide therapeutic decisions is justified.

References

1. Gustot et al . (2015). Clinical Course of acute-on-chronic liver failure syndrome and effects on prognosis. Hepatology (Baltimore, Md.). 62. 10.1002/hep.27849.

2. Moreau, Richard et al. Acute-on-Chronic Liver Failure Is a Distinct Syndrome That Develops in Patients With Acute Decompensation of Cirrhosis. Gastroenterology , Volume 144 , Issue 7 , 1426 - 1437.e9