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Abstract Book

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Oral Presentations - Monothematic Conference on ACLF, Alcohol and Liver Transplantation

OPM1

1-year outcomes of patients with ACLF admitted to ICUs in the Netherlands

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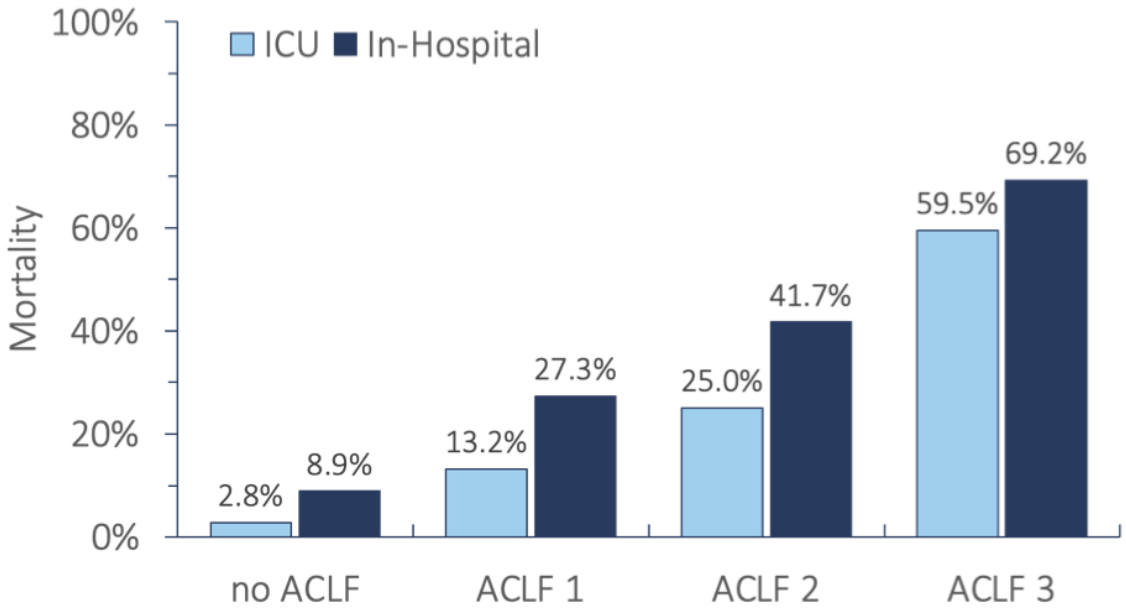
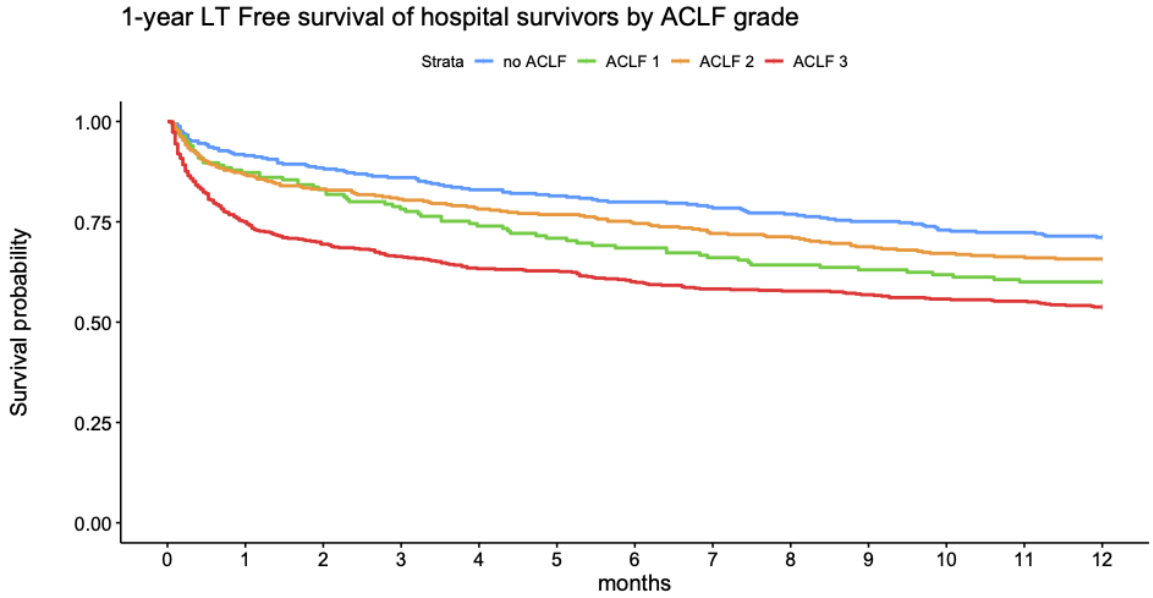
Background
Cirrhotic patients with Acute-on-chronic liver failure (ACLF) often require ICU admission. Data addressing the outcomes of these patients remains scarce, mainly limited to specialized liver transplant centres and predominantly focused on short-term outcomes. Our aim was to evaluate the 1-year outcomes of patients with ACLF admitted to all ICUs in the Netherlands.
Methods
We conducted a nationwide observational cohort study using data from the Dutch ICU quality registry (NICE). We included adult patients with an history of cirrhosis or first complications of cirrhotic portal hypertension admitted to all ICUs in the Netherlands between 2012 and 2020. ACLF grade was classified according to EASL-CLIF criteria.
Results
We included 3,055 patients, 1,819 (59.9%) had ACLF grade 3 at ICU admission. ICU and in-hospital mortality stratified by initial ACLF grade are shown in fig 1A. Within one year after ICU admission, 35 patients (1.2%) underwent liver transplantation (LT). As the severity of initial ACLF increased, the proportion of patients undergoing LT decreased (P=0.041). 1420 patients (46.9%) survived hospitalization after ICU admission. The overall 1-year LT-free survival after hospital discharge was 0.61 (95% CI 0.59-0.64). This rate was the highest in patients without ACLF (0.71[95% CI 0.66-0.76]) and lowest in those with ACLF-3 (0.53[95% CI 0.49-0.58])(Logrank P<0.0001)(Fig 1B). After adjusting for comorbidities and MELD-score, initial ACLF grade at ICU admission was not an independent risk factor for 1-year LT-free mortality after hospital discharge (P=0.56).
Conclusions
Initial ACLF grade is associated with in-hospital mortality of cirrhotic patients admitted to ICUs in the Netherlands. In those surviving hospitalization, initial ACLF grade is not an independent risk factor for 1-year LT-free mortality. Despite their limited 1-year survival prospects, only a small proportion of patients undergo liver transplantation after ICU admission for ACLF.

Figure 1A



ICU and in-hospital mortality stratified by initial ACLF grade

Figure 1B



1 year transplant-free survival after hospital discharge stratified by initial ACLF grade

Conflicts of interest

No conflicts declared

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OPM2

Results of the Swedish National Prioritization System for Liver Transplantation in Acute-on-Chronic Liver Failure

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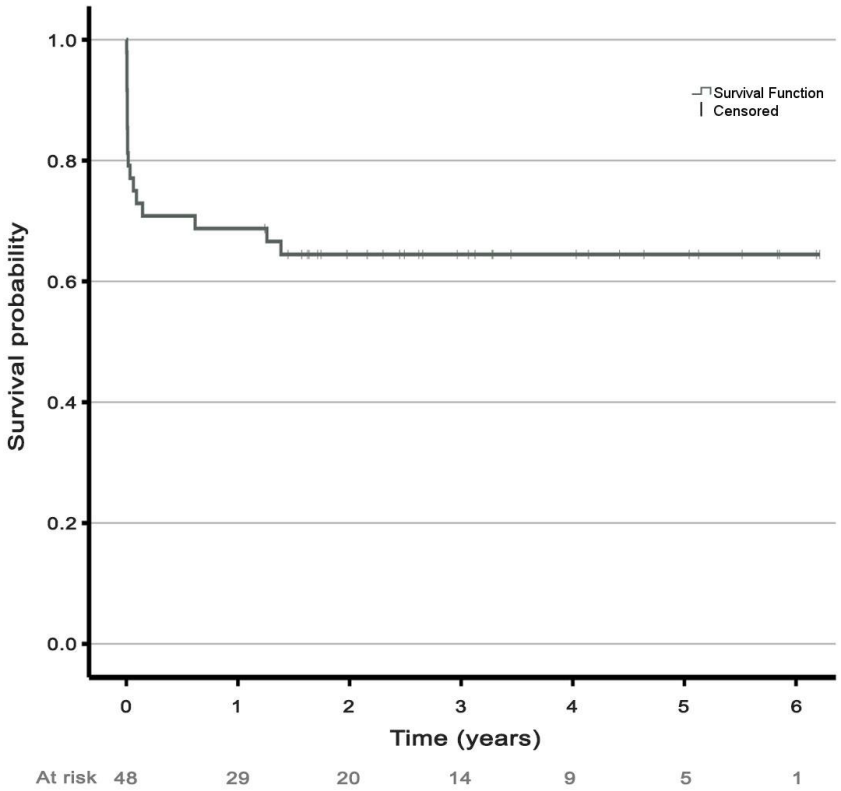
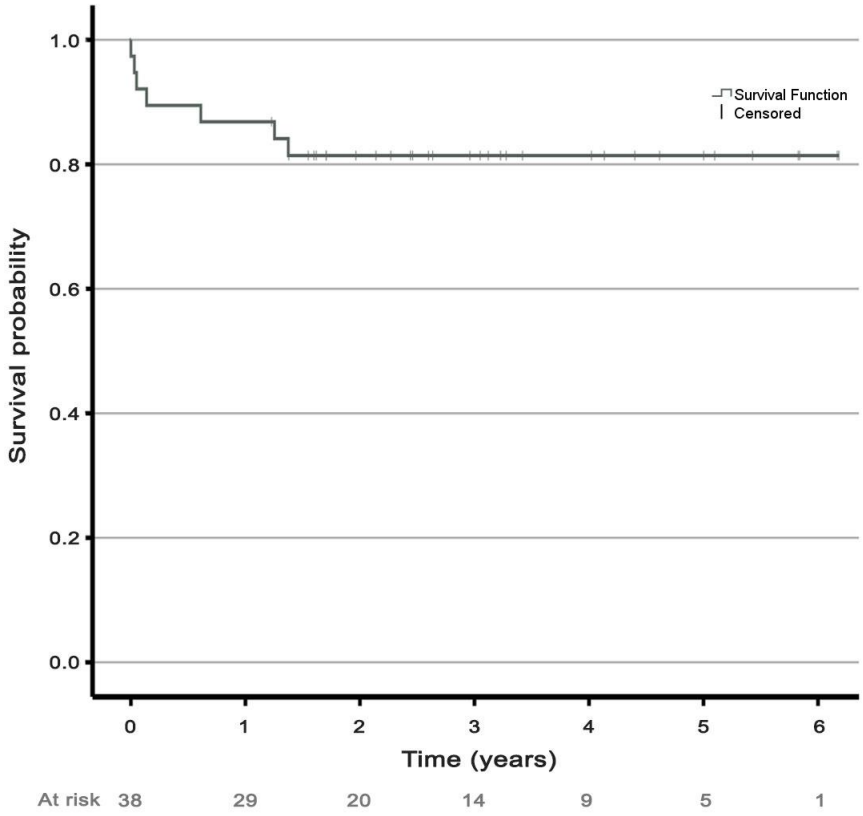
Background
Patients with acute-on-chronic liver failure (ACLF) have a high mortality without liver transplantation (LT). A national prioritization system for patients listed for LT with ACLF grade 3 (ACLF-3) was introduced in Sweden in 2017. We aimed to explore results and possible futility in patients listed according to the prioritization system.
Methods
All patients listed for LT according to the national prioritization system between January 2017 and December 2021 were included. All patients had a follow-up of at least 1 year. Survival from time of listing and LT, respectively, and risk factors for mortality were analyzed.
Results
During the study period, 48 patients with a median age of 56 years were listed for LT with ACLF-3. Thirty-eight (79%) underwent LT after a median of 5 (Interquartile range (IQR) 3 – 11) days. Of these, 31 (82%) were alive after a median follow-up of 1119 (IQR 722 – 1694) days. There were four (11%) early deaths within two months and three (8%) additional deaths within two years after LT. The intention-to-transplant 1-year survival was 69% and 1-year transplant survival was 87%. One-year graft survival was 84%. All patients not being transplanted died after a median of 3 (IQR 2 – 4.5) days.
Conclusions
The Swedish National prioritization system allowed a high proportion of patients with ACLF-3 to be transplanted within a few days. Patient and graft survival were excellent without signs of futility. These results reinforce suggestions that organ exchange organizations should consider a separate prioritization system for this patient category.



Kaplan-Meier survival function of patients listed for liver transplantation with ACLF grade 3, according to the national prioritization system (Intention-to-transplant survival).



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Kaplan-Meier survival function of patients who underwent liver transplantation after listing according to the national prioritization system for ACLF grade 3 (Transplant survival).

Conflicts of interest

No conflicts declared

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OPM3

Liver transplant pathway for acute on chronic liver failure: results of a single center study

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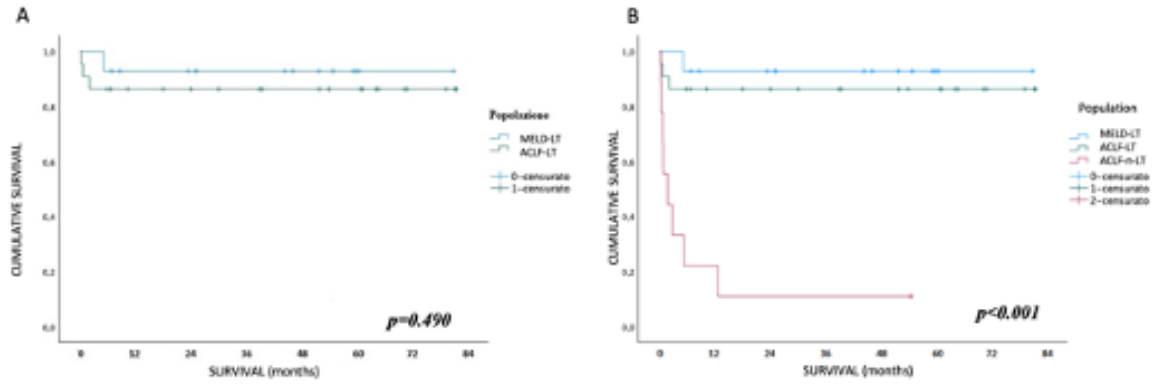
Background
While liver transplantation (LT) could represent the best therapeutic strategy for Acute on Chronic Liver Failure (ACLF), it is associated with high risk of pre-LT drop-out and post-LT complications. Therefore, LT indication for ACLF is still debated. The aim of our study is to evaluate the results and predictors of successful LT pathway in ACLF patients, comparing them to patients affected by severe cirrhosis.
Methods
A single-center, retrospective analysis of patients admitted to our Institution for ACLF between 2017 and 2023 was performed. Patients were divided into two groups: those who received LT for ACLF (ACLF-LT) and those who failed to achieve LT (ACLF-nLT). ACLF-LT patients were compared to patients transplanted in the same period for stable cirrhosis having MELD≥25 (MELD-LT).
Results
30 patients were admitted for ACLF, 15 of them received LT, while the others failed to reach transplantation. The most common cause of acute decompensation in ACLF was bacterial infection (10/30,35%). Compared with ACLF-LT, leukocyte count and INR were higher in the ACLF-nLT group (p=0.02 and 0.008, respectively). Consistently, both splenic artery and vein diameters were significantly smaller in ACLF-nLT vs ACLF-LT (p=0.007 and 0.06, respectively). MELD in ACLF-LT was 33, while in MELD-LT 26 (p=0.006). *Despite ACLF showed higher rate or liver, respiratory and kidney failure pre-LT,* early post-LT survival was comparable to MELD-LT (p=0.451) (Figure A). However, a slower post-LT graft recovery was highlighted in ACLF-LT. Conversely, ACLF-nLT showed worst survival compared to the other groups (Figure B).
Conclusions
Our study confirms the prognostic severity of ACLF in the absence of LT. Transplantation for ACLF and severe cirrhosis showed comparable survival rates, although graft recovery was slower in patients with ACLF. The impact of pre-LT coagulopathy and leukocytosis were critical variables to be investigated in the ACLF transplant pathway.



Conflicts of interest
No conflicts declared

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OPM4

Cognitive impairment in liver transplant candidates with AUD – a single liver transplant center pilot study

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Background
Patients with liver cirrhosis are prone to various cognitive impairment, what in alcohol-use-disorder (AUD) might be related to alcohol-induced neuroinflammation, decreasing hippocampal white matter with memory impairment, and reducing of the prefrontal cortex, critical to executive function and decision making.
Methods
To evaluate the occurrence of cognitive impairment in patients with AUD at listing to liver transplantation (LT) we included 101 consecutive adults with AUD (male 78%, mean age 53±11 years, mean MELD score 16±7 points) reported as potential candidates for LT treatment. In total, 17% had hepatocellular carcinoma (HCC), and 83% were evaluated to LT due to chronic liver failure. Cognitive function was assessed by the Addenbrooke Cognitive Test III (ACE III) with cut-off < 89 points for Mild Cognitive Impairment (MCI), and < 82 points for a high probability of dementia.
Results
In total, 86% patients had impaired cognitive results assessed by ACE III: 33% had only MCI and 52% met the criteria for dementia. Ammonia venous blood concentrations was 86±57 µg/dl with hyperammonemia in 45% individuals. The result of total ACE III in the entire cohort was 78±12 points with the worst results for verbal fluency and visuospatial abilities. The ACE III was significantly correlated with years of education (rho 0.39, P<0.001) and Child-Pugh Class (CPC) (rho -0.26, P<0.008). MELD score was linked with ACE III attention subdomain (rho -0.24) and ACE III language subdomain (rho -0.25), both P<0.05. Deceased patients had lower ACE III than the survivors (P=0.01). Patients with dementia had shorter period of education (P<0.001) and higher CPC (P=0.04), but there were no other clinical differences, comparing to patients with ACE III > 82. Finally, we found that CPC (OR 1.51, 95%CI 1.14 - 1.99, p = 0.004) and time of education (OR 0.65, 95% CI0.53 – 0.79) were independent risk factors for dementia. There were no differences in ACE III and its domains regarding LT status.
Conclusions
Disturbing frequency of severe cognitive impairment bordering on dementia in the group of AUD patients applying for LT treatment requires further research to develop an early detection and prevention program, especially since blood ammonia plays a minor role as a predictor of mental dysfunction in these individuals.
Conflicts of interest
No conflicts declared

OPM5

"Early" vs "standard" liver transplantation in patients with severe alcoholic hepatitis

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Background
Liver transplantation (LT) is an established therapeutic option for a subgroup of highly selected patients with alcoholic-hepatitis non-responder to medical treatment (MT). While some patients have a rapidly progressive disease leading to an early-LT, others initially improve with MT but need to be evaluated for a standard-LT in the following months for persisting decompensation.
Methods
Aim of the study is to describe the features of early-LT versus standard-LT for severe alcoholic hepatitis. One hundred consecutive patients with severe-AH referred to our center since April 2016 were considered, with those non responder to medical treatment being evaluated for LT.
Results
Fifty-three patients were non-responder to MT and 17 underwent early-LT within 27 days from admission. Of the 47 responder patients, 14 were subsequently listed with 13 being transplanted after a median of 166 days for persisting decompensation despite initial clinical improvement, Fig.1. Patients receiving standard-LT had lower MELD-Na scores at presentation compared to early-LT (27 vs 34; p=0.008) and a lower prevalence of ACLF-grade 2-3 (23% vs 82.4%; p=0.002). After multivariate analysis patients with MELD-Na≥30 at index hospitalization were 5.88(95%CI:2.31-16.41) times more likely to be non-responders to MT than those with a MELD-Na < 30, while those with ACLF grade 2-3 were 12.56 (95%CI:4.95-35.04) times more likely to be non-responders as compared to those with ACLF grade 0-1. (Fig.). Overall, 15 LT recipients (50%) suffered from depression and 10 (33%) received antidepressants post-LT. Three patients in all (10%) relapsed into any alcohol consumption. Twenty-nine (97%) are currently alive after a median follow-up of 32.2 months from LT.
Conclusions
Patients with SAH have different patterns of progression. Of those transplanted, 57% received an early-LT and 43% a standard LT. Overall, the transplant benefit was huge and relapse into alcohol consumption acceptable, 10%. Treatment of psychiatric comorbidities proved valuable to mitigate the risk of relapse.

Conflicts of interest
No conflicts declared

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OPM6

If phosphatidyl ethanol (PEth) were the golden standard, this would be the portrait of post-liver transplant alcohol use: the RAULT study

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Background
Alcohol-associated liver disease (ALD) is a leading cause of liver transplantation (LT) worldwide. In this study, we aimed to assess alcohol relapse post-LT for ALD (RAULT) using phosphatidyl ethanol (PEth). We also aimed to identify risk factors and compare RAULT by PEth with RAULT by previous diagnostic criteria (1).
Methods
A prospective study on adult patients with ALD who were transplanted between May 2008 and June 2023. To diagnose RAULT, we introduced PEth testing in July 2020. We excluded patients who died <1 month post-LT. Data included demographics, clinical and laboratory variables, and for RAULT i) indirect biomarkers, and ii) quarterly PEth (defined as moderate: 0.05–0.3 µg/l; severe: >0.3 µg/l).
Results
Of 360 LT patients, 143 with ALD were analyzed, 29% female, mean age 56-yo. PEth identified RAULT in 46 patients (32.2%; severe in 16%). Time was an independent risk factor for RAULT (OR=1.17, P=0.0002) and severe RAULT (OR=1.14, P=0.0093). Overall, PEth detected 7% more RAULT cases than standard criteria; specifically, PEth confirmed true concordance between patient's and clinician's side in 68.5% (44% abstainers, 24.5% RAULT); in 7.7%, positive PEth disproved their concordance on abstaining; finally, negative PEth vindicated 23.8% of patients in whom clinicians suspected RAULT.
Conclusions
Measuring PEth changed 31.5% of RAULT diagnosed by accepted clinical criteria: vindicated one in four patients under suspicion of RAULT and revealed 7.7% unsuspected RAULT.
Conflicts of interest
No conflicts declared
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OPM7

Impact of first microbial infection on outcomes in natural history and trajectories in cirrhosis

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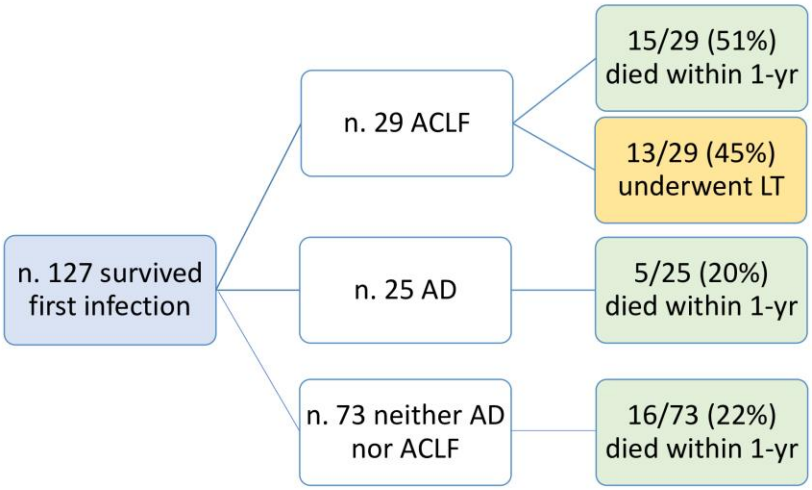
Background
Microbial infections are frequent complications in cirrhosis, resulting a common trigger of acute-on-chronic liver failure (ACLF). However, data about long-term impact are conflicting. Our aim was to prospectively evaluate epidemiology of microbial infections, their severity and impact on outcome of decompensated cirrhotic patients admitted at our unit.
Methods
All adult patients admitted at our unit between Jan 2017 and Dec 2022 with diagnosis of microbial infection were consecutively enrolled, analysing severity and source of infection. Outcome was assessed both during the first hospitalisation and within 1-yr, prospectively collecting further episodes of acute decompensation (AD) or ACLF or liver transplantation (LT).
Results
236 admissions with infections in 165 patients were evaluated. Patients were predominantly male (67.9%) with median age 57.4 years; the prevalent aetiology of cirrhosis was alcohol (47%). The most common source of infection was bloodstream (28%), followed by pneumonia and spontaneous bacterial peritonitis. Out of 140 culture-positive infections (59% of total), gram positive and MDR-strains were 52% and 43%, respectively. Only 47/165 (28%) patients were infected at admission, 42% presenting with ACLF. MELD score and qSOFA ≥2 were associated with ACLF development at multivariate analysis.
Overall, 38/165 (23%) died during first hospitalisation. Within 1-yr from discharge, ACLF occurred in 22% patients who survived first infection (n. 127) and was associated with cumulative mortality significantly higher than those who experienced AD (51% vs. 20%). All patients surviving ACLF, except one, underwent LT within 6 months from the episode. (image)
Conclusions
Microbial infection is associated with high in-hospital mortality, especially when ACLF occurs. More than 20% of patients experience ACLF within 1-yr after discharge; this condition is associated with poor survival and short time window for liver transplantation.



Conflicts of interest
No conflicts declared

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OPM8

Assessing Multidrug-Resistant Bacterial Colonization in Critically Ill Cirrhotic Patients in a Tertiary Center in Croatia: Burden, Risk Factors, and Outcomes

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Background
Considering the increasing multidrug-resistant organism (MDRO) prevalence and the heightened susceptibility of cirrhotic patients to infections, addressing the MDRO burden and impact is essential (1). The primary aim of this study was to determine the impact of MDRO colonization on outcomes in critically ill cirrhotic patients, with secondary objectives focusing on epidemiological and risk factors for colonization.
Methods
We conducted a retrospective cohort study involving 65 cirrhotic patients admitted to a tertiary center in Zagreb, Croatia, between 2018-2023. MDRO colonization was assessed through nasal, pharyngeal, and rectal swabs upon ICU admission and 7 days after. Clinical, demographic, and laboratory data were collected, including severity scores (CTP, MELD) and organ failure scores (SOFA, CLIF OF Scores).
Results
In the cohort, male patients constituted 67.9% of the cases, with alcohol-related liver disease prevailing at 80.4%. MELD avereged 27.18±7.964, MELD-Na 29.23±7.017, and the median SOFA score was 10 (4-21). ICU admissions were primarily due to infection (44.6%), with 82.1% having ACLF at admission (CLIF-ACLF score 59.89±9.99). Transplant-free survival during the ICU stay was observed in 57.1% of cases. MDRO colonization was found in 25% of cases pre-admission, with 24 isolates (Figure 1), consisting of 20.5% Gram-negative bacteria, 12.7% Gram-positive bacteria, and 8.9% both. Additionally, 16.7% (N=7) became colonized by day 7. However, colonization at ICU admission did not significantly affect outcomes. Only the MELD score (OR 1.137, CI 1.04 – 1.24) and CLIF ACLF score (OR 1.1, 9% CI 1.01 – 1.18) for the ACLF subgroup were independently associated with increased risk of death or transplantation. In univariate regression analysis, age at admission (p = 0.04, OR = 1.07, 95% CI 1.00 - 1.15), days hospitalized before ICU admission (p = 0.05, OR = 1.11, 95% CI 1.01- 1.22), and diabetes mellitus (p = 0.02, OR = 5.55, 95% CI 1.35 - 22.77) were identified as predictors of MDRO colonization.
Conclusions
Results highlight the predictive value of MELD and CLIF-ACLF scores for adverse outcomes in critically ill cirrhotic patients. MDRO colonization on ICU admission, while not directly impacting survival, underscores the importance of infection control. Nevertheless, it should be noted that the study population may be too small to validly assess the impact of colonization, warranting further research with larger cohorts.

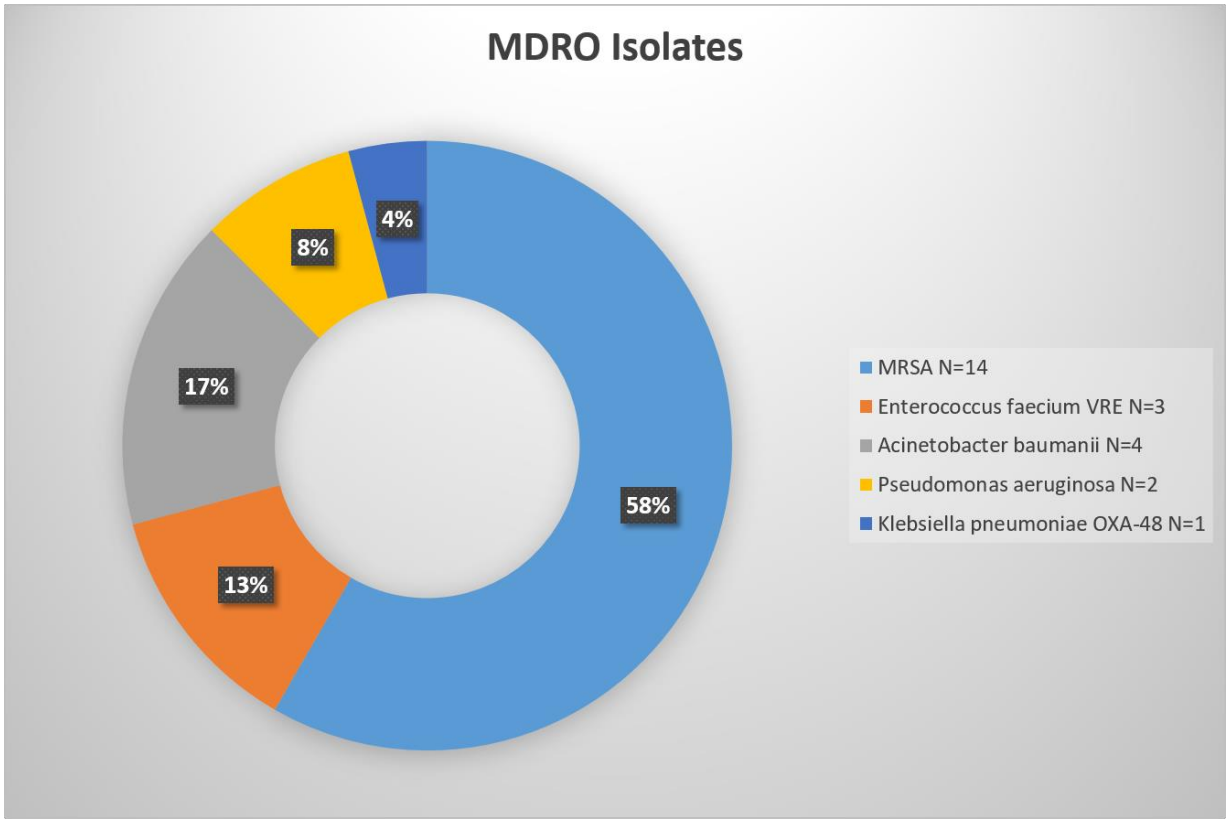

Figure 1: Isolates at the time of admission to the ICU; Abbreviations: ICU - Intensive Care Unit, MDRO - Multidrug-Resistant Organisms, MRSA - Methicillin-Resistant Staphylococcus aureus

Conflicts of interest
No conflicts declared

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Oral Presentations - Consensus Meeting on Liver Discard and Viability Assessment

OPC1

Sequential normothermic regional and end-ischemic ex-situ machine perfusion allows the safe use of very old DCD donors in liver transplantation (DCDNet trial)

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Background
In Italy, 20 minutes of continuous, flat-line EKG are required for death declaration. Despite prolonged warm ischemia time, Italian centers reported good outcomes in controlled DCD (cDCD) liver transplantation (LT) by combining normothermic regional and end-ischemic machine perfusion. This study aimed to evaluate the safety of the use of older cDCD donors with this approach.
Methods
All cDCD older than 70 years were evaluated during normothermic regional perfusion (NRP) and then randomly assigned to dual hypothermic (D-HOPE) or normothermic machine perfusion (NMP).
Results
From April 2021 to December 2023, 25 cDCD older than 70 years were considered. Sixteen (64%) liver grafts were transplanted, in 9 cases (36%) the graft was not considered suitable for LT (NRP or NMP parameters, histology, hepatic artery thrombosis at procurement, machine perfusion technical failure). The median donor age was 82 years (IQR: 79-84), being 9 (56%) older than 80. The mean functional warm ischemia was 39 ± 15 minutes. Grafts were randomly assigned to D-HOPE (9 grafts) or NMP (7 grafts).There were no cases of primary non-function. One patient (D-HOPE LT) experienced delayed non-function, treated with reLT. Four cases of post-reperfusion syndrome (25%, 50% D-HOPE vs 50% NMP group) and 2 cases (12%) of early allograft dysfunction were observed. At a median follow-up of 12 months, no vascular complications were reported, 3 patients experienced biliary complications: 2 anastomotic stenosis and 1 biliary fistula. No patients experienced ischemic cholangiopathy. No major differences were found in terms of post-operative hospitalization or complications based on the type of machine perfusion.
Conclusions
The implementation of sequential normothermic regional and end-ischemic machine perfusion allows the safe use of very old cDCD donor grafts in LT.
Conflicts of interest
No conflicts declared

OPC2

13C-Methacetin Breath Test Enables Assessment Of Liver Function During Hypothermic Oxygenated Machine Perfusion

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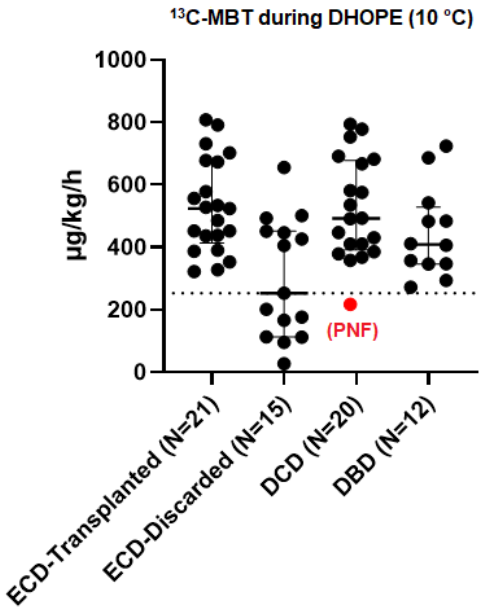
Background
Dual hypothermic oxygenated perfusion (DHOPE), performed at 10 °C, is proven to reduce (biliary) complications after transplantation. However, the low temperature restricts the capability to perform functional assessment on extended criteria donor (ECD) livers. Sequential controlled oxygenated rewarming and normothermic machine perfusion (COR-NMP) has emerged as testing protocol, but is expensive and labor intensive. The 13C-Methacetin Breath Test (13C-MBT) is a clinically validated cytochromal breath test to assess liver function before and after major liver surgery. We investigated the potential of ultra-sensitive 13C-MBT to assess liver function already during DHOPE.
Methods
We performed the 13C-MBT after 60 minutes of DHOPE in 32 livers primary accepted for transplantation and in 36 human grafts that underwent additional COR-NMP testing. Decision to transplant was independent of the 13C-MBT score. Median values are given with their interquartile range.
Results
Twenty (63%) of the primary accepted livers were derived from donors after circulatory death. One of these graft resulted in a primary non-function with immediate re-transplantation. This graft had the lowest score of all the transplanted livers (217 µg/kg/h), as shown in red in the figure.
Fifteen livers were declined after DHOPE-COR-NMP for transplantation based on biliary (N=6; 40%), hepatocellular (N=3; 20%) or combined acceptance criteria (N=6; 40%). The 13C-MBT score ranged from 27 to 808 µg/kg/h in the whole DHOPE-COR-NMP cohort. Transplanted livers had significantly higher 13C-MBT (524 [436-673] µg/kg/h) values, compared to the discarded livers (253 [140-449] µg/kg/h, p = 0.002).
Conclusions
In conclusion, ultra-sensitive 13C-MBT is feasible during DHOPE and enables the assessment of liver metabolism, even in the cold. This is the first real-time function test to assess donor livers, indicating very poor to excellent performance. This might make additional COR-NMP testing superfluous in these areas.
Conflicts of interest
No conflicts declared



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OPC3

Does prolonged hypothermic oxygenated perfusion (HOPE) provide other advantages than improved logistics for all liver types?

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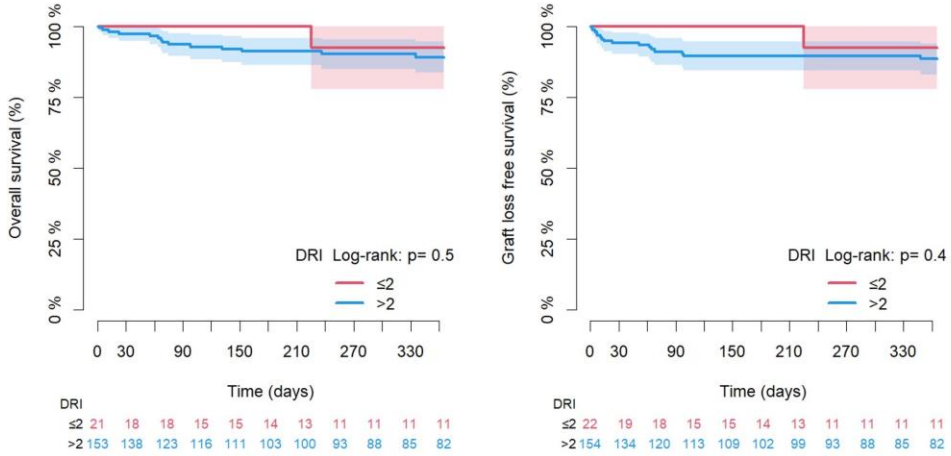
Background
Hypothermic oxygenated perfusion (HOPE) is increasingly used to extend liver preservation to improve transplant logistics. However, little is known about its benefits in high-risk liver grafts. We performed a national retrospective cohort study to investigate whether prolonged dual DHOPE provides benefits other than improved logistics for all liver types.
Methods
All Italian liver transplants between 2015 and 2022 preserved with DHOPE for ≥4h were included. The impact of risk profiles and preservation times on the transplant outcomes was assessed with univariate and multivariate regression models.
Results
Overall, 177 cases were included from 12 centers. The median DHOPE duration was 5h (IQR: 4.32–6.10). One-year graft survival was 89.1%. The incidence of acute kidney injury (AKI) was 30.5%, and biliary complications were 23.2%. No differences in transplant outcomes were observed according to DRI, Eurotransplant definition for marginal grafts, and balance of risk (BAR) score (Figure 1). DHOPE duration was associated with a lower risk of AKI in multivariable models adjusted for DRI [OR: 0.744 (95%CI: 0.554–1.000) p=0.050], Eutrotransplant marginal grafts [OR: 0.714 (95%CI: 0.532–0.958) p=0.025], and BAR score [OR: 0.735 (95%CI: 0.552–0.979) p=0.035] . The best cut-off for DHOPE duration in association with AKI was 5.25h. Prolonged HOPE of >5.25h confirmed its protective effect against AKI in a multivariable model adjusted for donor and recipient risk factors [OR: 0.390 (95%CI: 0.187–0.811) p=0.012].
Conclusions
Prolonged DHOPE is widely used to improve transplant logistics, provides good results with high-risk grafts, and seems associated with a lower risk of posttransplant AKI. These results provide further evidence of the metabolic role of DHOPE and promote its use in preventing posttransplant complications.

A



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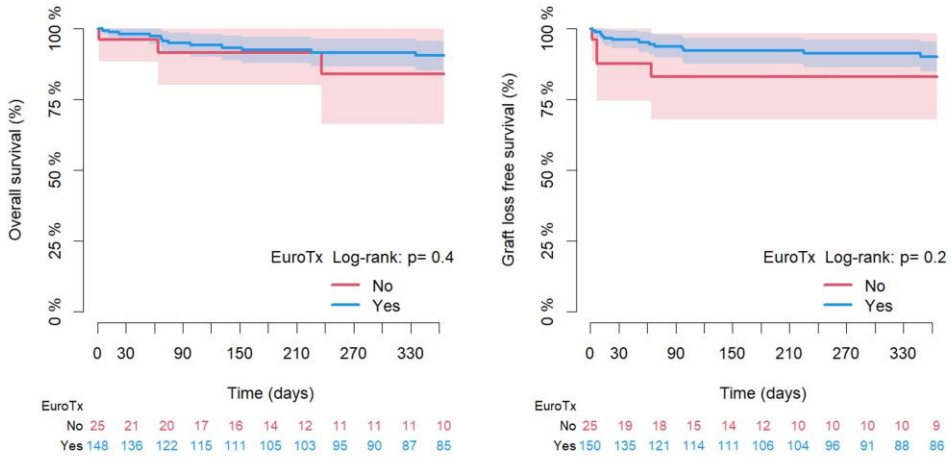

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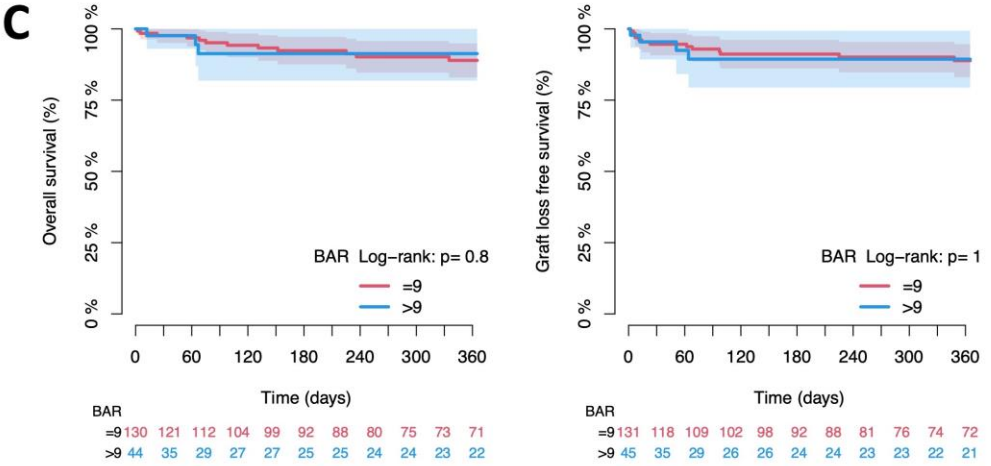

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Figure 1 – Patient and graft survival of groups of different risk according to DRI (A), Eurotransplant definition of marginal grafts (B), and BAR score (C). No significant differences in patient and graft survival were observed.

Conflicts of interest

No conflicts declared

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OPC4

Oxygen delivery and consumption during hypothermic oxygenated machine perfusion and their impact on post-liver transplant outcome

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Background
Hypothermic oxygenated machine perfusion (HOPE) has significantly enhanced the reconditioning of liver grafts. While maintaining a partial pressure of oxygen (pO2) above 600 mmHg (80 KPa) has been recommended for liver tissue oxygenation, recent findings highlight the negative correlation between increased carbon dioxide (CO2) production and graft damage. However, the intricate relationship between oxygen delivery (DO2) and consumption (VO2) during HOPE remains unexplored. This study aims to investigate the interplay between DO2 and VO2 during HOPE and their impact on post- liver transplant (LT) outcomes.
Methods
Cases of dual hypothermic oxygenated machine perfusion (DHOPE) conducted at our institution were categorized based on perfusate pO2 levels: >600 mmHg (H-DO2) and <600 mmHg (L-DO2). Achievement of pO2 <600 mmHg involved titration of post-liver pO2 (>120 mmHg). DO2 and VO2 were computed using the modified Fick equation.
Results
Twenty-seven livers underwent DHOPE and subsequent transplantation, comprising 12 from brain-dead and 15 from cardiac-dead donors. Among these cases, 13 (48.1%) were in the L-DO2 group, while 14 (51.9%) were in the H-DO2 group. In L-DO2 grafts, DO2 was 1.46±1.07 ml/min (pO2 233±89 mmHg), and VO2 was 0.82±0.44 ml/min, whereas, in H-DO2 grafts, DO2 was >5.06±1.95 ml/min (pO2>600 mmHg), and VO2 was >0.56±1.14 ml/min. The increase in DO2 was directly correlated with VO2 (r=0.56; p=0.056), and both were associated with portal flow (r=0.81, p=0.001; r=0.58, p=0.047), but the two groups exhibited no differences in portal flow (p=0.214). Notably, LT outcomes were comparable except for early allograft disfunction (EAD). EAD was observed in grafts with higher DO2 (p=0.021), but not VO2 (p=0.451). Grafts with steatosis ≤30% had higher VO2 than those with steatosis>30% (0.933±0.216 ml/min vs. 0.594±0.233 ml/min; p=0.038).
Conclusions
During DHOPE, portal flow exerted a greater influence on DO2 than pO2. Elevated DO2 may impact graft function post-LT, while steatosis may influence graft metabolic activation during HOPE. Consequently, titrating pO2 to achieve lower DO2, particularly in grafts with high portal flow, should be considered.
Conflicts of interest
No conflicts declared

OPC5

Assessment liver function with indocyanine green during clinical ex-vivo normothermic machine perfusion

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Background
Normothermic machine perfusion (NMP) enables pre-transplantation assessment of donor liver viability to increase (extended criteria) donor liver utilization. However, unambiguous objective criteria to determine integrated liver function during NMP to decide upon acceptance are still lacking. This study investigates whether the indocyanine green (ICG) elimination test can be applied to assess liver function during NMP.
Methods
Donor livers underwent dual-hypothermic oxygenated machine perfusion and NMP. The ICG elimination test (Figure) was improved during an optimization phase (n=10) and correlated to current functional perfusion parameters and post-transplantation outcomes in clinically perfused livers (n=32). The decision to accept the liver for transplantation was made regardless of the ICG elimination test outcome.
Results
The ICG plasma disappearance rate (PDR) during NMP was dependent on perfusion blood flow and liver weight. After correcting the PDR for these factors, the corrected PDR (NMP-PDR) was correlated to the hepatic extraction rate (R=0.923; P>0.001) and ATP-content in liver biopsies at 2-hours of NMP (R=0.692; P=0.027).
In the clinical phase, the length of the functional warm ischemia time in the donation process was inversely correlated to the NMP-PDR (P=0.042). Both individual acceptance criteria (lactate clearance, ability of self-regulate pH, Δbicarbonate, and ΔpH) and overall hepatocellular and cholangiocellular acceptance criteria were correlated to the NMP-PDR. The NMP-PDR was higher in the cohort accepted for transplantation (n=18) than in the non-transplanted cohort (n=14: 18.1 (14.0-22.7)%/L·Kg vs 11.8 (8.8-12.9)%/L·Kg; P<0.0001). Furthermore, the NMP-PDR correlated with the L-GraFT7 score post-transplantation (R=-0.551; P=0.027).
Conclusions
We demonstrate that the NMP-PDR separates good and poor performing livers during NMP and predicts short-term post-transplantation function. This simple objective test has the potential to increase donor liver utilization rate, while preventing hepatocellular complications post-transplantation.

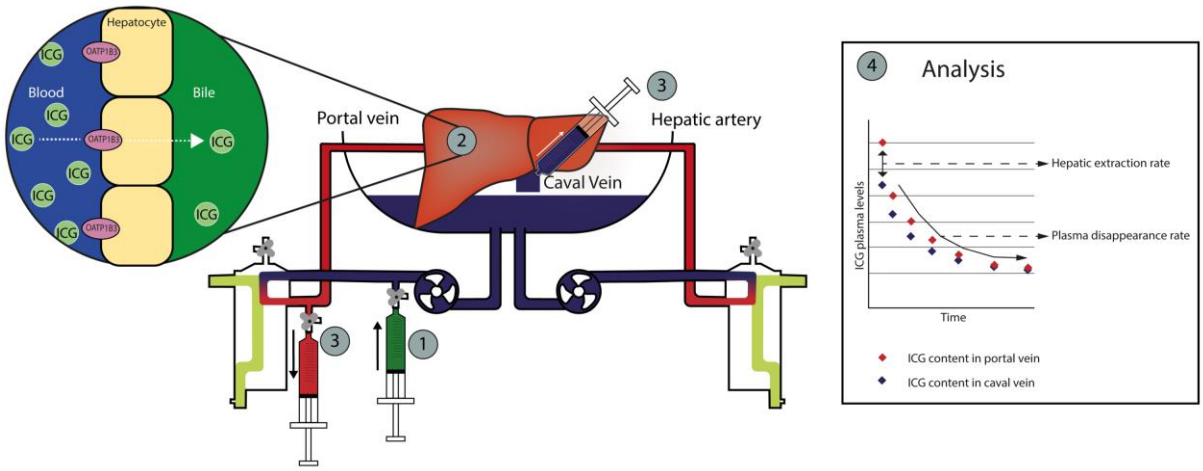

Figure consist of overview of performing the ICG elimination test in normothermic machine perfusion. (1) 20mg of indocyanine green (ICG) is administered. (2) ICG uptake into the hepatocyte occurs across the sinusoidal membrane (3) Blood samples are simultaneously taken from the portal circuit and the

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inferior caval vein. The samples are stored on ice and protected from light; subsequently, they are processed and stored at -80. The concentration ICG is measured in the samples on a wavelength of 805nm in a standard plate reader. (4) Analyses are performed

Conflicts of interest

No conflicts declared

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OPC6

Comparing ex situ function of DBD and DCD livers during normothermic machine perfusion

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Background
One of the main potential benefits of normothermic machine perfusion (NMP) is the ability to objectively assess ex situ liver function during preservation. To date, published viability criteria have not distinguished between DBD and DCD liver grafts. The aim of this study is to compare the ex situ function of these two donor types, which could have important implications in the development of future viability criteria.
Methods
All liver grafts perfused on the OrganOx metra device at a single centre between April 2019 and December 2023 were reviewed from a prospectively-maintained database. All livers were perfused after cold storage, on arrival at the recipient centre. Data pertaining donor and preservation characteristics as well as ex situ functional parameters were compared between DBD and DCD liver grafts. Specifically, markers of hepatocellular function were assessed through perfusate blood gas and biochemical analysis and cholangiocyte function through bile analysis.
Results
A total of 215 livers were perfused during the study period; 119 (55%) DBD grafts and 96 (45%) DCD grafts. Donor characteristics were similar between the groups with no significant differences observed. At 1h NMP, DCD grafts had a higher perfusate lactate than DBD grafts (3.04±2.59mmol/L vs 2.20±1.60mmol/L; p=0.007, respectively) but by 4h, values were comparable (p=0.9). DCD grafts displayed more acidosis (p=0.01) and required more sodium bicarbonate supplementation to maintain a pH>7.3 throughout the perfusion (40ml (10-125ml) DCD vs 30.5ml (10-95ml) DBD, p=0.0004). Perfusate ALT was significantly higher in DCD livers at 1h (p<0.0001), 2h (p<0.0001) and 4h (p<0.0001) and a higher percentage increase in ALT over time was also observed in the DCD group (1201U/L (17-8156U/L) to 1638U/L (280-9651U/L); 31% increase, vs 582U/L (46-12537U/L) to 759U/L (64-13685U/L); 23% increase, p=0.004). Significant differences in biliary parameters were also seen with a bile pH at 2h of 7.77±0.07 in DBD livers and 7.69±0.10 in DCD livers (p<0.0001) and median bile glucose at 2h of 4.6mmol/L (1-19mmol/L) in DBD grafts compared to 14.5mmol/L (1-41mmol/L) in DCD grafts (p<0.0001).
Conclusions
We demonstrate considerable differences between the ex situ function of DBD and DCD livers during NMP suggesting that these grafts should be considered separately when developing viability criteria.
Conflicts of interest
No conflicts declared

OPC7

Livers Undergoing Extended Ex Situ Normothermic Machine Perfusion Develop Glutathione- And Methionine-cycle Alterations That Reverse Following Transplantation

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Background
While *ex situ* normothermic machine perfusion (NMP) is a promising technique for preservation, evaluation, and treatment of livers, current protocols do not provide physiological conditions, and the metabolic state of the liver may be altered while on the device. We aim to evaluate adequacy of support provided during extended *ex situ* liver NMP by characterizing metabolic profiles pre- and post-NMP and post-transplant.
Methods
Porcine livers (N=8) were subjected to NMP during 24H performed using a blood-based perfusate. After 2H, continuous hemodiafiltration was initiated. Parenteral nutrition, vitamins, and trace elements were added after 4H. Insulin and/or glucose were also given, as needed. After 24H, grafts were transplanted into recipients, which were followed for 5D. Tissue samples were collected in the donor, at the end of NMP, post-transplant, and at the end of follow-up. Targeted metabolomic analysis was performed to evaluate 2 metabolites in the glutathione and 9 in the methionine cycles. PERMANOVA was used to study dissimilarities among samples and univariate analyses to compare differences among times. Principal component analysis was used to identify metabolites with highest explained variance.
Results
During 24H NMP, hepatic artery and portal vein flows, bile production, and biochemical parameters were stable. Grafts functioned well upon reperfusion in their respective recipients. Metabolic profiling was able to group the samples according to time (P=0.001), showing more similarities between baseline and 5D with respect to the end of NMP and 1H post-transplant (**Figure 1**). Metabolites with highest explained variance included GSH, GSSG, Spermidine, Choline, SAMe, SAH and Methionine (**Figure 2**).
Conclusions
Ex situ NMP performed for 24H with continuous hemodiafiltration and nutritional support maintains liver viability, though reversible metabolic derangements do arise. In the future, improved metabolic support is needed to reproduce physiological conditions and maintain homeostasis during extended liver NMP.

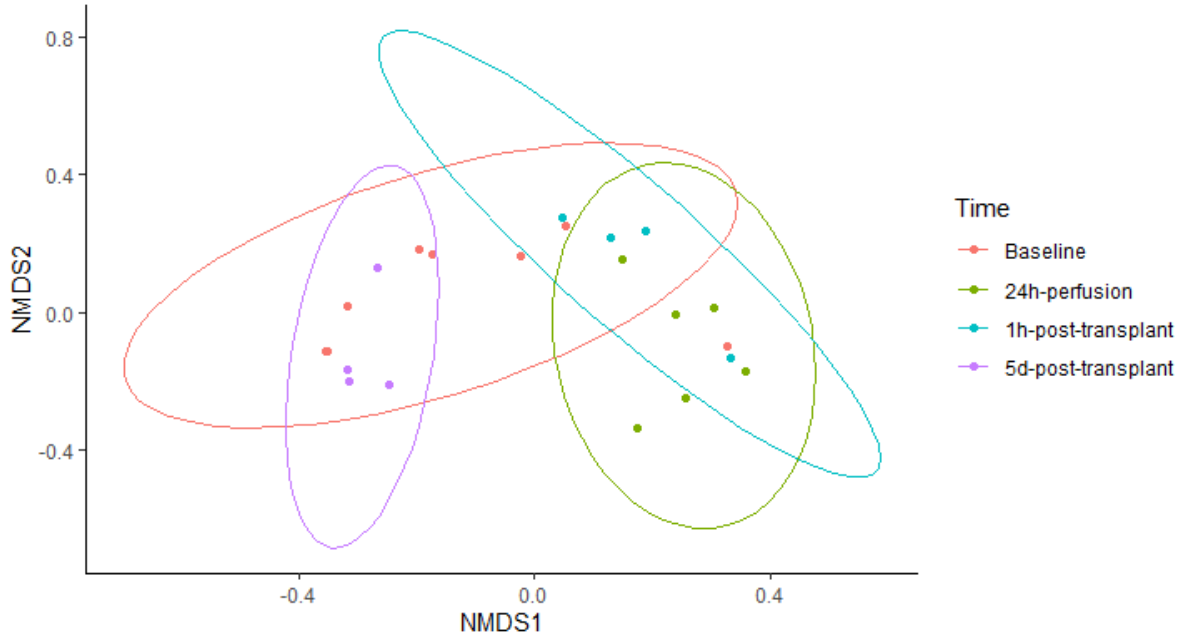

Figure 1. Representation of the dissimilarity index among samples calculated by the Bray-Curtis method for the time grouping variable: baseline, at the end of 24H *ex situ* NMP, 1H post-transplant, and 5D post-transplant. NMDS1 and NMDS2 axes represent the two main dimensions of the Non-Metric Multidimensional Scaling (NMDS) analysis.

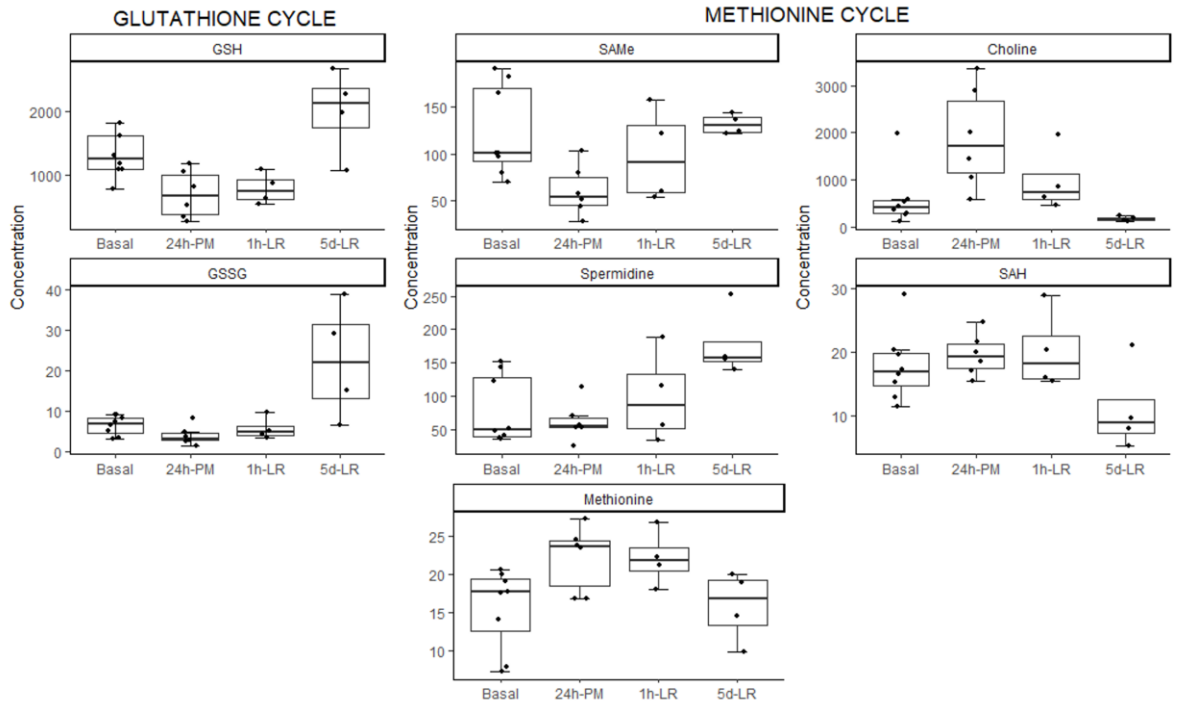

Figure 2. Distribution of metabolites with the highest variance explained by Principal Component Analysis at baseline, 24H in Perfusion Machine (PM), 1H of Liver-Reperfusion (LR) and 5 days of LR post-transplantation.

Conflicts of interest

No conflicts declared

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OPC8

Lactate clearance during normothermic liver perfusion sufficiently predicts graft viability

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Background
The use of extended criteria grafts has become a mainstay in liver transplantation, especially in light of organ shortage. Normothermic perfusion (NMP) of marginal grafts is facilitated to omit the life threatening risk of primary graft non–function and to limit the incidence of poor function. The exact criteria for graft viability and function and the ideal duration of normothermic perfusion are not yet agreed upon.
Methods
Liver grafts from heart beating donation that underwent NMP with the OrganOx Metra from October 2019 to November 2023 at Muenster University Hospital were included. For this study, recipient, donor, graft and perfusion characteristics were analyzed. Lactate clearance during normothermic perfusion was applied for the determination of graft viability and evaluated for its predictive value for the incidence of primary graft non function. Secondary endpoints included short-term graft function and survival.
Results
146 NMP grafts were included, resulting in 131 liver transplantations. 15 grafts were discarded during NMP due to insufficient lactate clearance. The donor risk index of the perfused grafts was 1.85 (1.10-2.30). The duration of NMP was 835 (193-1653) minutes. Perfusate lactate < 2 mmol/l at 6 hours of NMP was highly predictive for initial graft function. The incidence of primary non function in these grafts was 1.5% (n=2), whereas 33.3% (n=2) of the 6 grafts that were transplanted outside these criteria showed primary non-function ($p < 0.001$). The rate of primary non-function was independent from the donor risk index, the MELD score and the duration of NMP. Additionally, poor lactate clearance was significantly associated with early allograft dysfunction.The clinical outcome of the recipients with an initially functioning graft was mostly determined by the MELD score.
Conclusions
Six-hour perfusate lactate clearance during NMP is a simple and reliable predictor of liver graft viability.
Conflicts of interest
No conflicts declared

OPC9

Continuous hemodiafiltration prevents sinusoidal endothelial failure during extended ex situ normothermic perfusion of porcine livers

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Background
Ex situ normothermic machine perfusion (NMP) is a promising strategy for liver preservation. There is still no consensus on requirements for optimal preservation of graft integrity. We aim to evaluate the impact of continuous hemodiafiltration (HDF) applied during extended liver NMP.
Methods
Porcine livers (N=16) were perfused for 24H using a blood-based perfusate. Nutrition, vitamins, and trace elements were added after 4H. Insulin and/or glucose were also given, as needed. In a subset of cases, continuous HDF was initiated after 2H (N=5). Perfusate was sampled serially during perfusion to analyze markers of injury, inflammation, and hepatocellular and biliary function. Liver parenchymal and biliary tissue samples were also taken at the start and end of perfusion to assess histological injury, hepatic stellate cell (HSC) activation (α-SMA), and endothelial cell (EC) response (eNOS, KLF2, CD31).
Results
During 24H NMP, AST and LDH levels progressively increased for the first 12H and were higher in grafts without HDF (Figure 1). HDF also improved glucose consumption and lactate clearance (Figure 1), though bile production and quality and histological biliary injury did not vary. Levels of pro-inflammatory IL-6 and IL-8 were significantly higher in grafts without HDF at 12 and 24H (Figure 2). Increased gene and protein expression of α-SMA reflected greater HSC activation, while decreased gene and protein expression of KLF2 and eNOS reflected reduced vasodilatory capacity of EC in grafts undergoing NMP without HDF (Figure 2). Consequentially, increased endothelial congestion and decreased EC area were observed among non-HDF livers (22±4% vs. 29±1% P=0.006).
Conclusions
During extended *ex situ* NMP, addition of continuous HDF is associated with a less inflammatory environment and maintenance of cellular mechanisms and responses necessary to maintain the normal microarchitecture and size of the sinusoidal lumen in isolated liver grafts.

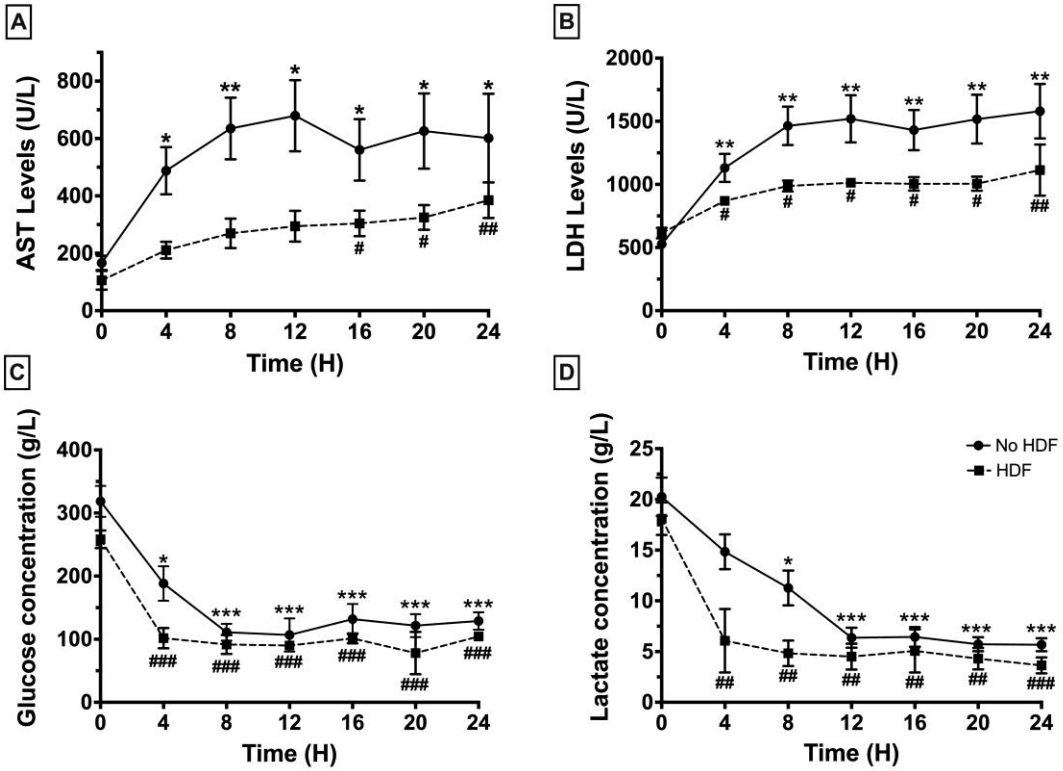

Figure 1. Levels of AST (A), LDH (B), glucose (C), and lactate (D) during 24H *ex situ* liver NMP, both with ("HDF") and without ("No HDF") continuous hemodiafiltration. * P<0.05; ** P<0.01: *** P<0.001

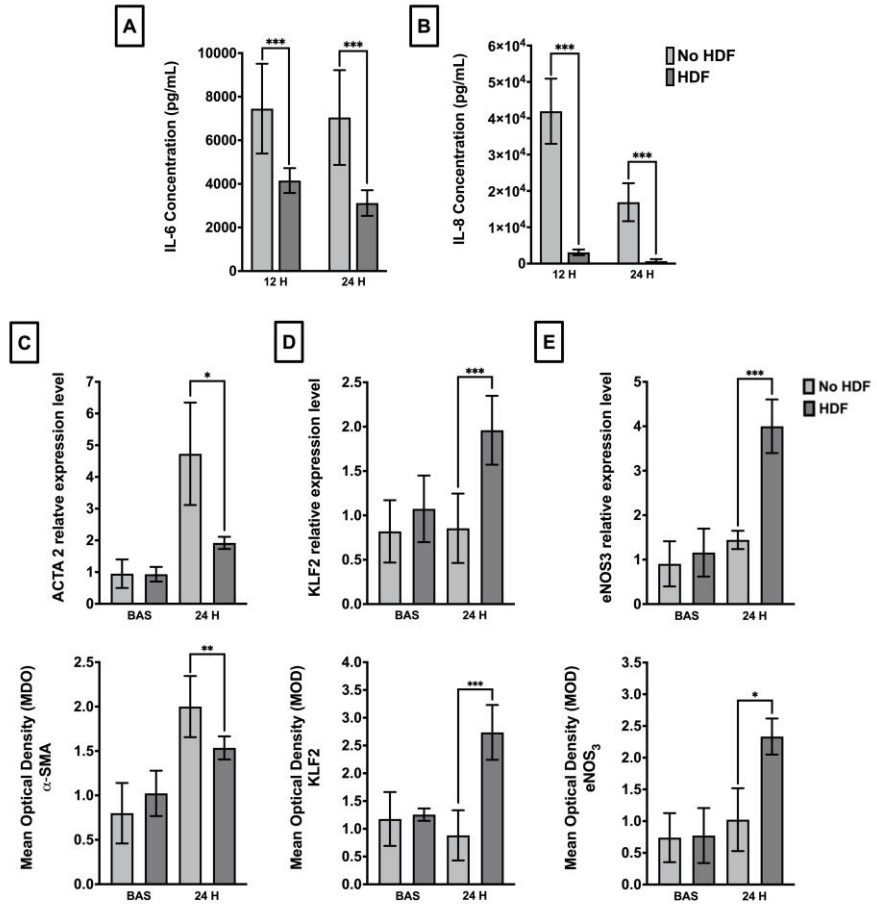

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Figure 2. Levels of IL-6 (A) and IL-8 (B) in perfusate and alpha-SMA (C), KLF2 (D), and eNOS3 (E) in tissue measured throughout 24H *ex situ* liver NMP, both with ("HDF") and without ("No HDF") continuous hemodiafiltration. Baseline levels of IL-6 and IL-8 are not expressed in the figure as they were negligible. * P<0.05; ** P<0.01: *** P<0.001

Conflicts of interest

No conflicts declared

References

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Posters – ELITA Summit 2024

PP01

Long-term high-risk of de-novo HBV-hepatitis (DNHB) in HBsAg-negative liver transplant recipients of anti-HBc positive grafts: a multicentre real-life experience

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Background
The use of Anti-HBc-positive liver grafts (cAbLG) can lead to de-novo HBV-hepatitis (DNHB) after liver transplantation (LT), being the risk related to both recipient's virological profile and the antiviral prophylaxis. Aim: to describe the long-term risk and predictors of DNHB in cAbLG recipients.
Methods
All HBsAg-negative/HIV-negative adult recipients of cAbLG in two Transplant Centres (Bergamo and Milan Policlinico) from 2003 to 2018 were retrospectively enrolled and followed-up until June 2023. According to pre-LT recipient's HBV virological profile, patients underwent prophylaxis with either Lamivudine (LAM), LAM+Immunoglobulins anti-HBs (HBIg) until 2015 and then LAM-monotherapy, or HBV monitoring. DNHB, i.e HBsAg and/or HBV-DNA positivity, was assessed *per* protocol every 6 months.
Results
Among the 1,557 transplanted patients, 178 (11%) receiving a cAbLG [76% male, 56 years-old, 37% previous HCC, 41% HBV *naïve* (antiHBc-/antiHBs-), 32% *Dual*+ (antiHBc+/antiHBs+), 16% *antiHBc*+, 11% *antiHBs*+] underwent prophylaxis with LAM (53%), LAM+HBIg (29%) or monitoring (18%). Overall, during 84 (4-284) months, 21 (12%) patients developed DNHB after a mean of 47 (4-126) months (67% LAM-resistance, 71% ALT >ULN, 48% HBeAg positivity, no DNHB-related death) with a 10-year cumulative risk of 15% (95%CI 10-23%), higher (p=0.012) in *naïve* (22%), *antiHBs*+ (16%), *antiHBc*+ (10%) than *Dual*+ (4%). No DNHB was reported during 43 (4-184) months of LAM+HBIg. Among the 159 recipients on LAM-monotherapy (*ab-initio* or after HBIg-withdrawal), DNHB occurred in 21, with a 10-year risk of 14%, being HBV *naive* (HR 2,64, p=0.036) the only risk factor for DNHB. Even analyzing only LT-recipients managed according to current guidelines (n=106), the 10 year-risk of DNHB was 14% (95%CI 7-25%; 89% in *naive*) in LAM-prophylaxed and 5% in monitored patients.
Conclusions
cAbLG in HBsAg-negative LT-recipients using LAM prophylaxis is hampered by the long-term risk of DNHB. Third-generation antiviral drugs should be considered at least in *naive* patients.
Conflicts of interest
No conflicts declared

PP02

Use of von Willebrand Factor Antigen for preoperative decision making in HCC patients subjected to resection or transplantation

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Background
Liver transplantation (LTx) and liver resection (LR) are potential treatment options for patients with hepatocellular carcinoma (HCC). We previously reported on von Willebrand factor antigen (vWF) as a predictor of post-hepatectomy liver failure (PHLF) and early mortality on the waiting list for LTx. In this study, we explore the use of vWF as a tool for perioperative decision-making in patients with HCC.
Methods
Included patients were diagnosed with HCC and underwent either LR or listing for LTx at Medical University of Vienna (MUV) and Mayo Clinic Rochester (MCR) between 2004 and 2022. VWF was evaluated prior to LR or at listing for LTx, respectively. The previously evaluated cut-offs at 182% and 291% vWF were used to divide the cohort into low- (≤ 182%), intermediate- (183% - 291%) and high-risk (> 291%) groups. Clinical course and overall survival (OS) were prospectively documented and retrospectively analyzed.
Results
443 patients were included: 106 patients underwent LR (MUV: 72, MCR: 34); 337 patients were listed for LTx (MUV: 214, MCR: 123), of those 199 underwent LTx (MUV: 124, MCR: 75). Patients in intermediate- and high-risk groups undergoing LR displayed higher incidences of PHLF (4.0% vs 27.5% vs 53.3%, p<0.001). Further, postoperative OS was significantly reduced in both these cohorts (median in months: 95.5 vs 46.7 vs 13.7, p=0.006). As previously reported, HCC patients with increased vWF had reduced survival on the waiting list (p=0.01). Yet, no difference in post-LTx OS was observed when comparing risk groups according to vWF (median in months: not reached vs 130.4 vs 116.6, p=0.343). Similarly, OS from listing was comparable between vWF risk groups (median in months: 108.7 vs 131.8 vs 90.0, p=0.390).
Conclusions
We here present an international bicentric evaluation of vWF as a perioperative decision-making tool for patients with HCC. Patients with high vWF prior to LR show an increased risk for PHLF and reduced OS and therefore seem to derive limited benefit from surgery. Further, increased vWF is associated with early mortality on the LTx waiting list. As post-LTx and post-listing OS was comparable between risk groups according to vWF, patients presenting with HCC and high vWF values may benefit from LTx listing. We conclude that vWF can optimize LR and LTx decision-making for patients with HCC.
Conflicts of interest
No conflicts declared

PP05

The development of a new healthcare professional: “The organ perfusionist and transplantation coordinator (OPTC).”

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Background
Rapid developments in machine perfusion uncovered the need for a new professional in the field; the organ perfusionist. In the Netherlands, the profession of organ perfusionist combined with transplant coordinator tasks (OPTC) was nationwide established in 2023. This new organ transplant professional, the OPTC, is homebased at the transplant center and is responsible for the organ offers, all logistical aspects related to organ transplantation, as well as the organ perfusion itself. At the University Medical Centrum Groningen (UMCG), OPTCs are involved in liver, lung, kidney, and heart perfusions. This integration streamlines the transplantation logistical process and enhances coordination and efficiency. Within a year the OPTC professional has become an essential and indispensable part of the organ transplantation chain, which has been successfully introduced and implemented at a national level.
Methods
To accommodate the education for this profession, the UMCG established the first international training course for organ perfusionists. This healthcare program covers liver-, lung-, kidney- and heart perfusion as well as in situ normothermic regional perfusion. The course consists of online interactive seminars and e-learnings and has three onsite practical training weeks over a duration of 11 months. Since 2022, 29 organ perfusionists from 6 countries have successfully completed the program.
Results
In 2023, 1328 organ offers were received by OPTCs at the UMCG. From these offers, 89 organs (65 livers, 13 lungs, 8 hearts and 3 kidneys) were preserved and resuscitated through machine perfusion. With the help of OPTCs, complex transplantations can be postponed to daytime hours, resulting in perfusion procedures that can continue for up to 24 hours. In the UMCG this workload is shared between 8 OPTCs and 2 organ perfusionists.
Conclusions
In conclusion, present-day liver transplantation requires a resource of well-trained and supported organ perfusionists.
Conflicts of interest
No conflicts declared

PP06

Pediatric transplant after circulatory determination of death and normothermic regional perfusion

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Background
Limited availability of suitable donors for children remains a challenge for pediatric transplantation. Although there are multiple studies in adults demonstrating the success of normothermic regional perfusion (NRP) in controlled donation after circulatory death (cDCD), little is known about pediatric recipients. We report our experience in pediatric transplantation with cDCD organs.
Methods
This is a retrospective, observational cohort study analyzing the outcomes of pediatric patients (18y) who underwent liver (LT), multivisceral (MVT), kidney (KT) and heart transplant (HT) using NRP in cDCD organs between 2021 and 2023.
Results
There were 31 cDCD transplants (5 LT, 3 MVT, 16 KT and 7 HT). The median of days on the waitlist was 30.4 (23.6-58.7) for LT, 273 (107-988) for MVT, 26.3 (11.5-85.6) for KT and 45 (17-64) for HT. The median functional warm ischemia time was 21.5 min (IQR: 7-30) and the median duration of NRP was 94 min (IQR: 53-191). One year graft survival was 80%, 67.7%, 87.5% and 83.4% for LT, MVT, KT and HT. No ischemic cholangiopathy or vascular complications occurred in liver recipients. Kidney recipients had an acceptable rate of delayed graft function (13.5%).
Conclusions
cDCD pediatric transplant with NRP represents an extra source of good quality grafts especially valuable for children with a longer waiting list time.
Conflicts of interest
No conflicts declared

PP07

Implementation of liver machine perfusion in the Netherlands: "A decade of pioneering"

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Background
Considerable developments have been achieved in the implementation of ex situ liver machine perfusion over the past decade. At the University Medical Center Groningen (UMCG), the Netherlands, organ perfusion has been transformed from a research pursuit into an indispensable part of current clinical practice.
Methods
The introduction of DHOPE-COR-NMP has significantly expanded the pool of available donor livers for transplantation in such a way, that in 2023 20% of all liver transplantations (17/83) in our center were performed after NMP (**Figure 2**). Since 2014, we have implemented dual hypothermic oxygenated machine perfusion (DHOPE) for livers donated after circulatory death (DCD) to improve outcomes and decrease post-transplant ischemic cholangiopathy rates. Additionally, prolonged DHOPE is currently used in both DCD and donation after brain death grafts to facilitate daytime transplantation (**Figure 1**).
Results
As a result, in 2023 (D)HOPE was used in 45% (37/83) of our liver transplant cases (**Figure 2**). Since 2017, normothermic machine perfusion (after an initial episode of DHOPE and controlled oxygenated rewarming (DHOPE-COR-NMP)) was introduced to allow for viability testing of high-risk donor livers that were initially deemed ineligible for transplantation. Over the years, approximately two-third of NMP-perfused livers are utilized for transplantation, and utilization rates remain stable (**Figure 1**).
Conclusions
In conclusion, machine perfusion has rapidly developed and established itself as an important resource and mainstay of our liver transplant program. We propose that all resources for machine perfusion should, therefore, standardly be incorporated in operational planning. In the UMCG, this has uncovered the need for a new professional in the field; the organ perfusionist.

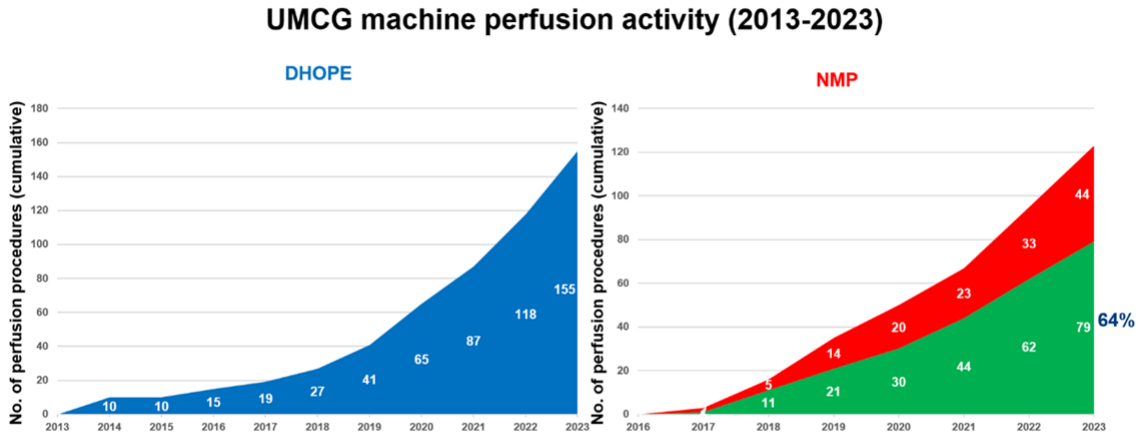

Figure 1: Cumulative number of dual hypothermic oxygenated machine perfusion (DHOPE) and normothermic machine perfusion (NMP) procedures at the University Medical Center Groningen (UMCG), the Netherlands.

Figure 1

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ESOT Team askme@esot.org

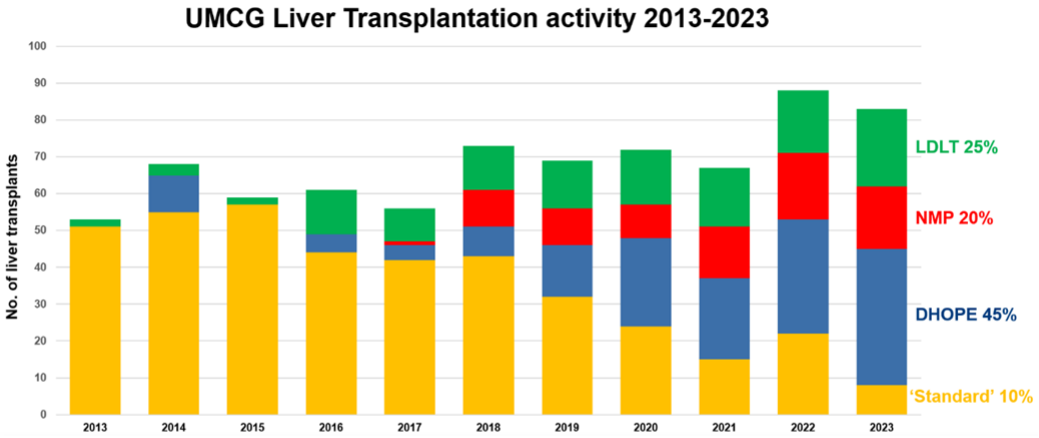

Figure 2: Annual number of liver transplantations at the University Medical Center Groningen (UMCG), the Netherlands, by number of dual hypothermic oxygenated machine perfusion (DHOPE) procedures, normothermic machine perfusion (NMP) procedures, living donor liver transplantation (LDLT) procedures, or transplantation without machine perfusion or living donation ('standard').

Figure 2

Conflicts of interest

No conflicts declared

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PP08

Predicting early recurrence of hepatocellular carcinoma after liver transplantation by using a Bayesian network model with preoperative data

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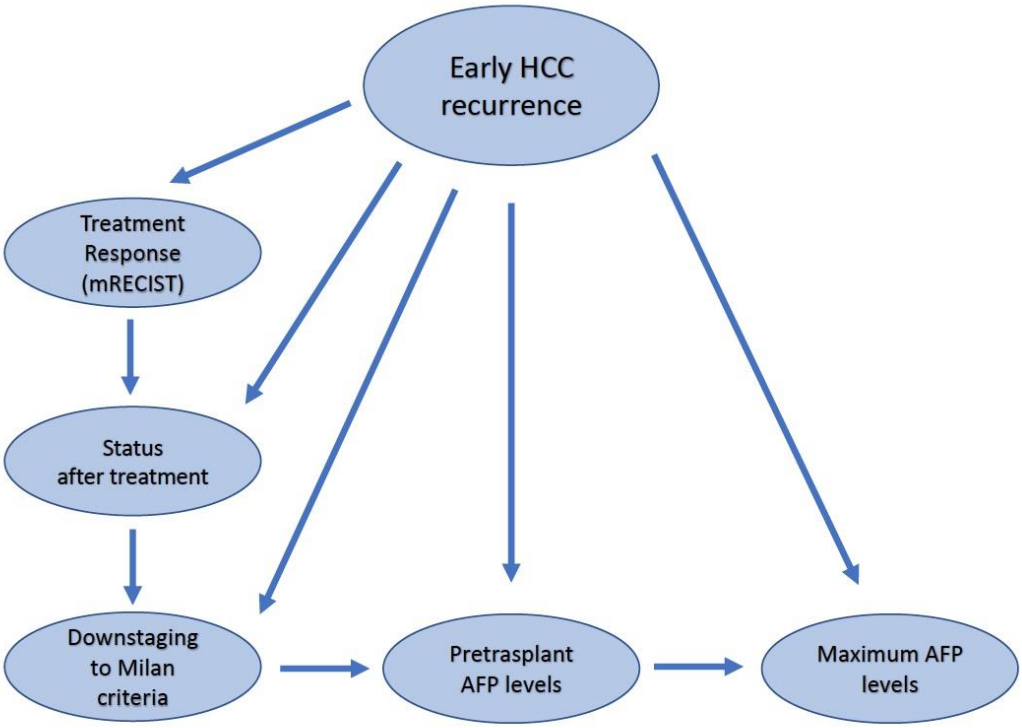
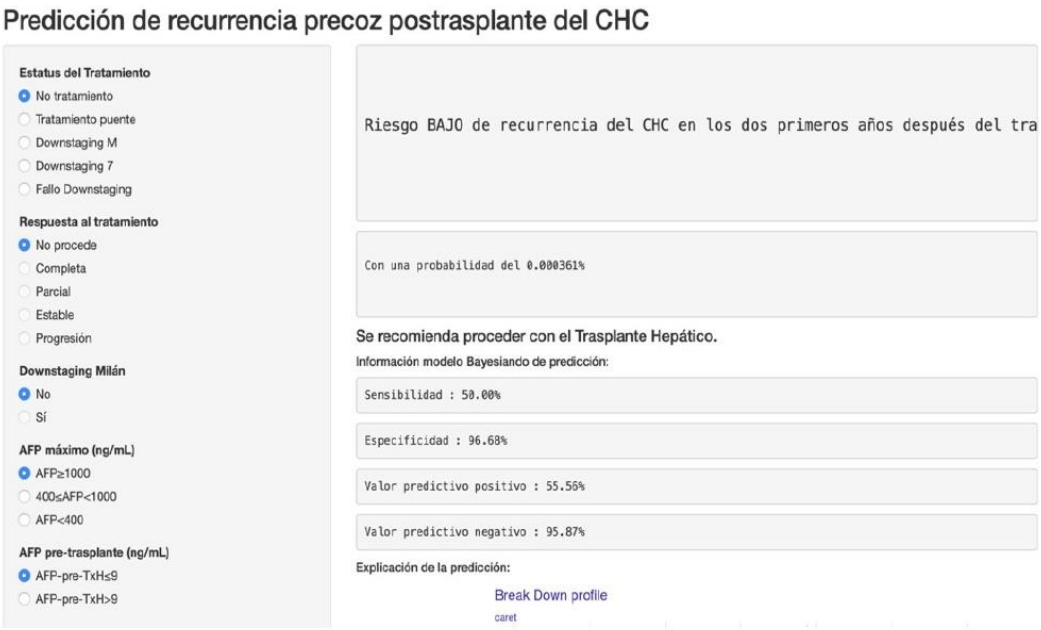
Background
Biological markers and response to locoregional treatment are key factors in accurately predicting the risk of early recurrence of hepatocellular carcinoma after liver transplantation (LT). Artificial intelligence and Bayesian network predictive models can be useful for analyzing the complex biological behavior of HCC. The aim of this study was to develop an artificial intelligence-Bayesian network predictive model to determine the probability of HCC recurrence within the first 2 years following LT, by using variables available only prior to transplantation, to identify more precisely patients with high risk of recurrence
Methods
We developed a Bayesian network model named the artificial intelligence–Bayesian network based on radiologic response and alpha-fetoprotein (ABANERA) model to predict HCC recurrence within the first 2 years after LT based on variables available prior to transplantation. The model was developed with a training group consisting of 385 patients from our center. Internal validation was performed with an independent group of 130 patients who underwent transplantation at the same center. Receiver operating characteristic curves and the area under the curve (AUC) were used to evaluate model performance. The following utility values were assigned to each possible outcome obtained by applying the model: true-positive = 1, false-negative = - 0,9, true-negative = 0,85 and false-positive = 0,25. Furthermore, we created an open-access web interface to facilitate practical application of the model
Results
The model performed very well when predicting early recurrence of hepatocellular carcinoma: AUC = 0.817 (95% confidence interval [CI] 0.717–0.888) in the training group and AUC = 0.889 (95% CI 0.792–0.985) in the validation group. The following performance values were obtained: sensitivity 52.3%, specificity 90.3%, positive predictive value 41.1%, and negative predictive value 93.6% (training group) and sensitivity 50%, specificity 93.7%, positive predictive value 55.6%, and negative predictive value 95.9% (validation group)
Conclusions
Our predictive model accurately determines the probability of HCC recurrence within the first 2 years following LT using variables only available prior to transplantation, with very high specificity values, and can be applied to clinical practice through an open-access web interface.



Graphical predictive model (ABANERA) based on a Bayesian network



Data inclusion form for the open access web application: http://oceano.uv.es:3838/RBRecidiva

Conflicts of interest

No conflicts declared

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PP09

Nor-ursodeoxycholic acid application during normothermic machine perfusion improves biliary markers

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Background
Normothermic machine perfusion (NMP) enables pharmacotherapy and monitoring of graft regeneration. Nor-ursodeoxycholic acid (norUDCA) has antiinflammatory, antifibrotic, and antilipotoxic properties. It modulates bile acid metabolism and was found to induce bile production with higher bicarbonate and lower cholesterol content. These properties might lead to reduced bile toxicity after ischemia and therefore reduced ischemia-reperfusion injury. We aimed to investigate the therapeutic potential of norUDCA during NMP and monitor its effect on the perfused liver.
Methods
During NMP of 23 secondarily declined livers, 10 grafts were treated with a bolus of 1500mg norUDCA after 2h of perfusion, total duration was 12h. Blood gas analysis of bile and perfusate including pH, bicarbonate, glucose, lactate, as well as additional analyses including lactate dehydrogenase (LDH), cholesterol, sodium, magnesium, calcium, was performed every hour. Liver and bile duct biopsies were collected before and after NMP.
Results
In NorUDCA grafts the bile bicarbonate was higher (240 min: p=0.013*, 300 min: p=0.019*) and the bile cholesterol was lower (240 and 360 minutes: p=0.007**); bile lactate was lower (600 minutes: p=0.015*) as well as bile LDH was lower in norUDCA grafts (360: p=0.042*, 480: p=0.003**, 600: p=0.109, and 720 minutes p=0.043*) ; bile sodium was higher (180: p<0.001**, 240: p=0.004**) in norUDCA livers.
Conclusions
The effect of NorUDCA on bile production during NMP seems to be comparable to previous animal model data. NorUDCA might be able to ameliorate the detrimental effects of bile on the damaged biliary tree after ischemia. Its diverse therapeutic effects make it an immensely promising agent for application during NMP in the context of liver transplantation.
Conflicts of interest
No conflicts declared

PP10

Organ Quality Assessment for Livers (OrQA-L): Real-time visual assessment of steatosis during retrieval using machine learning models

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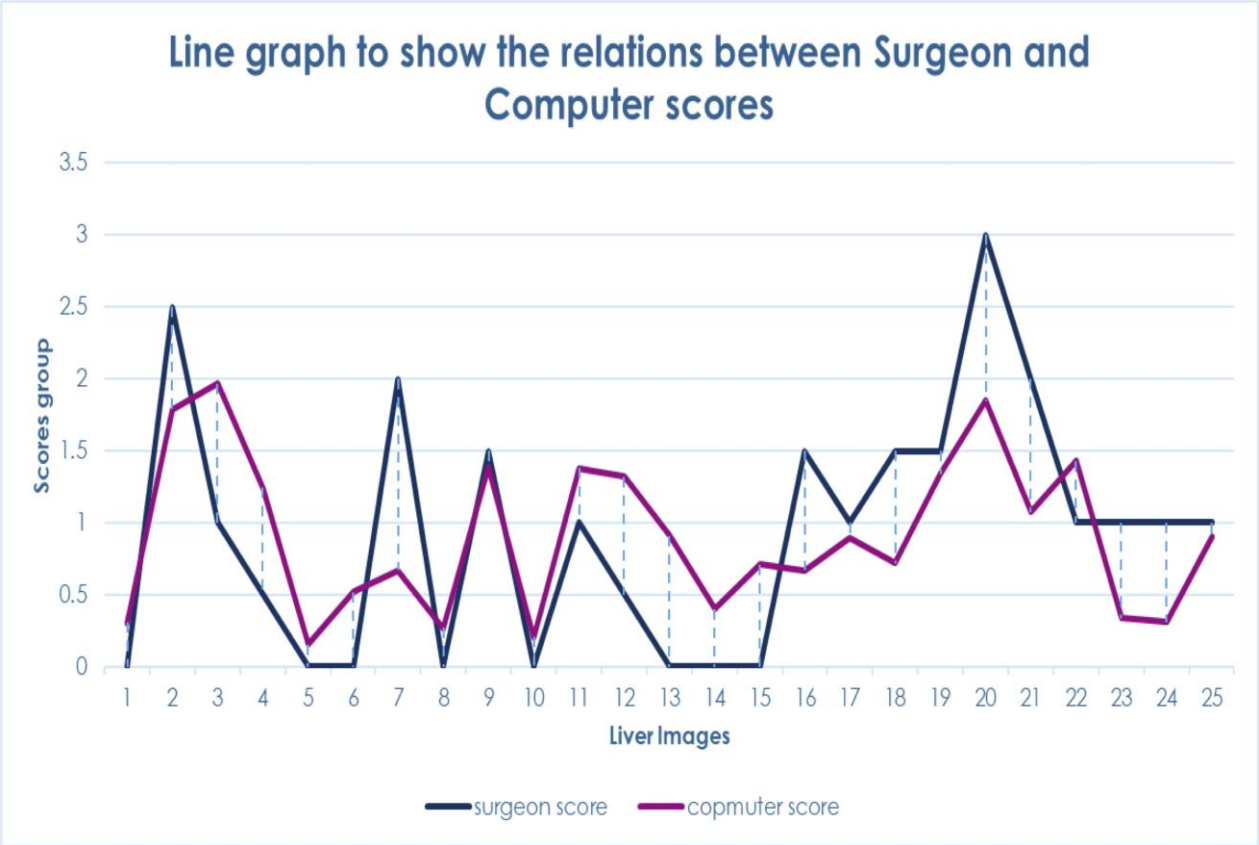
Background
Macroscopic assessment of liver steatosis during transplant retrieval is currently subjective and reliant on surgeons' experience. Inter-rater variability may lead to unwarranted discard of livers. In view of the rising incidence of fatty liver disease, developing an objective, reliable, and point of care assessment tool is crucial. Our aim was to develop a machine-learning-based (ML) decision aid to objectively assess hepatic steatosis using photographs at time of retrieval.
Methods
Liver transplant surgeons scored 226 images on a 0-3 steatosis scale (≤1 - None, ≤2 - Mild, ≤3 - Moderate, >3 - Severe). Post image augmentation, 404 images were split into 342 for training and 62 for testing. An additional 25 images from a separate collection were used for validation. The model aimed to predict these steatosis scores/categories and was benchmarked against surgeon scores. All assessments were done via a web portal.
Results
Among the 62 testing images, Pearson's correlation coefficient between the model's predictions and surgeon scores was 0.705 ($p < 0.001$), with a mean-absolute-error (MAE) of 0.551 (SD 0.350), and AUROC of 0.66. For the 25 validation images, the Pearson's correlation coefficient was 0.606 ($p = 0.0013$), with a MAE of 0.575 (SD 0.398), and AUROC of 0.74. All images underwent processing and scoring in under 10 seconds.
Conclusions
The model demonstrates a consistent level of agreement with experienced liver transplant surgeons in the assessment of liver steatosis, highlighted by the small MAE between the model's predictions and the actual surgeon scores. Larger validation sets are required for formal performance assessment. The quick processing time indicates its potential as a point-of-care tool.



Conflicts of interest
No conflicts declared

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PP11

New skeletal muscle indexes to assess sarcopenia in patients with ACLF on alcoholic liver disease: a single center real-life study

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Background
Patients with acute-on-chronic liver failure (ACLF) due to alcoholic liver disease (ALD) have a high short-term mortality. Sarcopenia, assessed by skeletal muscle area (SMA) and skeletal muscle index (SMI=SMA/h^2) using CT imaging at L3, is frequent in such patients and impacts prognosis. New indexes are under evaluation: PMI (psoas area/h^2), PMVI (psoas volume/h^3) and IPMVI (iliopsoas volume/h^3), but scarce data exist. Aim of this study was to evaluate the accuracy of these indexes for describing sarcopenia and their association with outcomes.
Methods
A single-center retrospective real-life study enrolled ALD patients consecutively admitted the Liver Transplant Center of Bergamo from January 2016 to January 2023 for ACLF. SMI, PMI, PMVI and IPMVI were retrospectively obtained using MOOSE (an AI-based solution), ImageJ/Fiji and 3D Slicer on venous CT-scan performed at admission and compared with overall survival. Sarcopenia was defined as SMI ≤50 in male and ≤39 cm^2/m^2 in female.
Results
40 ALD patients were enrolled: 88% male, 58 years, BMI 25 Kg/m^2, 15% diabetes, 13% active HCC, 78% previous acute decompensation, CPT score 12 (7-15), MELD 29 (19-39), ACLF score 50 (38-78), CLIF-sofa 10.5 (7-17). Infection (68%), alcoholic hepatitis (15%), hemorrhage (10%) and alcoholic hepatitis+infection (7%) caused ACLF (grade I/II/III in 38%, 35% and 27%, respectively). All except 2 male patients (95%) had sarcopenia. Median muscle indexes were: SMI 37 (27-53) cm^2/m^2, PMI 3.8 (1.2-6.9) cm^2/m^2, PMVI 41.2 (13.1-75.7) cm^3/m^3 and IPMVI 98.9 (63.7-154.2) cm^3/m^3. Fifteen (38%) underwent liver transplant after 1.3 (0.4-10.2) months but overall 19 (48%) patients died during 6.5 (0.1-72) months of follow-up. PMI at admission was significantly associated with different ACLF grades [I: 4.5 (2.5-6.9) cm^2/m^2, II: 3.8 (1.2-5.8) cm^2/m^2, III: 3.1 (1.9-4.7) cm^2/m^2, p=0.026], although was not related to survival.
Conclusions
Sarcopenia is almost always present in ACLF patients, higher PMI is associated with lower grade of ACLF.
Conflicts of interest
No conflicts declared

PP12

Combined Liver-Kidney transplantation in children. Long-term outcomes

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Background
Combined liver-kidney transplantation (CLKT) is an effective but complex surgical procedure for end-stage chronic kidney disease with associated liver disease. However, the experience with CLKT in children is limited due to the low incidence of these pathologies. Our aim is to describe our experience in CLKT and its long-term outcomes.
Methods
A retrospective single-center study was performed in patients who underwent CLKT between 1997-2023. We analyzed demographic, clinical and laboratory variables collected pre-transplantation, intraoperatively and postoperatively.
Results
Twenty-three patients (14 males, 9 females) were included, with a median age of 10.8 years (Q1-Q3:9.8-14.5 years) and median long-term follow-up of 10.5 years (Q1-Q3: 1.5-24.3 years). Underlying diseases were: polycystic kidney disease (n=9), primary hyperoxaluria (n=8), Alagille syndrome (n=2), nephronophthisis (n=2), methylmalonic acidemia (1) and atypical hemolytic-uremic syndrome (n=1). In all patients both grafts were obtained from the same cadaveric donor (median donor age 12 years, one split liver, one DCD donor). Liver ischemia mean time was 6.7±1.7 hours, anhepatic phase 50.4±4.5 minutes and cold renal ischemia 11.2±2.8 hours. Mean hospital stay was 38.9±17.6 days. At long-term follow-up, the graft survival rate was 90.9% and the overall patient survival rate was 95.5%. One patient required liver re-transplantation 48 hours after CLKT due to hepatic artery thrombosis. A single episode of acute renal rejection was observed 1 month after transplantation. One patient died 5 years after CLKT due to non-compliance with immunosuppressive treatment.
Conclusions
Our series of CLKT presents encouraging outcomes, with adequate graft function and high long-term survival, probably due to the immunoprotective effect of the liver on the renal graft. This fact must be considered in specific pathologies with liver and kidney involvement before inclusion for transplant.
Conflicts of interest
No conflicts declared

PP14

Antiplatelet prophylaxis reduces the risk of early hepatic artery thrombosis following liver transplantation in high-risk patients

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Background
The prevention of hepatic artery thrombosis (HAT) is pivotal for graft survival immediately after liver transplantation (LT). This study aimed to identify the surgical, donor and recipient related risk factors (RF) for early HAT (eHAT) and assessed the benefit of antiplatelet prophylaxis (AP).
Methods
This retrospective single-centre study included 854 patients who underwent primary LT between 2007-2022. Surgical RF for eHAT were predefined as arterial reconstruction, arterial anastomosis redo, arterial conduit, intraoperative arterial clotting during implantation resolved by immediate thrombectomy, or intraoperative fragile aspect. AP for three months was considered in patients with predefined surgical RFs (N=205) and administered in N=136 (66.3%). Primary endpoint was eHAT (i.e. HAT occurring within two months from LT).
Results
Overall, 6% of patients developed eHAT. In the multivariable analysis, the use of AP prophylaxis (aHR = 0.14), anastomotic redo (aHR = 4.64), arterial reconstruction (aHR = 4.46), recipient age below 45 (aHR = 2.28) and a diabetic donor graft (aHR = 2.63) were independently associated with eHAT. In patients with predefined surgical RFs who received AP, eHAT rate was significantly lower (2.9% vs. 29%, p<0.001) than those who did not receive AP (RF+,AP-) and one-year graft and patient survival was comparable to patients without any surgical RFs. In contrast, the RF+,AP- group showed significantly worse one year graft survival (72.2% vs 87.8%, p=0.003). AP use was not associated with increased bleeding complications (p = 0.37).
Conclusions
The main RFs for eHAT include surgical factors, donor diabetes and recipient age below 45. Implementing antiplatelet prophylaxis in patients with predefined surgical RFs significantly reduced eHAT development and improved graft and patient survival to a level comparable to recipients without any surgical RFs.
Conflicts of interest
No conflicts declared

PP15

Bulevirtide progressively improves liver function in liver transplant candidates with advanced HDV cirrhosis and severe portal hypertension

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Background
Chronic Hepatitis Delta (CHD) is the most severe viral hepatitis, remaining a prevalent indication for liver transplantation (LT). Bulevirtide (BLV) treatment has been approved for compensated CHD but data in patients with most advanced liver disease are lacking. Aim of this study was to describe BLV efficacy and safety in CHD patients in the LT waiting-list.
Methods
All consecutive CHD patients indicated for LT due to advanced cirrhosis at the LT Centre of Bergamo who started BLV were included in this prospective study. HDV-RNA was quantified by Robogene 2.0 (LLQ 6 IU/mL).
Results
All three Caucasian non-HCC patients with neither HCV/HIV infections nor alcohol use [2 male, 39 (31-43) years, CPT B8 (B7-B9), MELD 17 (15-17), qHBsAg 4,320 (2,336-6,124) IU/mL, HDV RNA 55,238 (27-355,260) IU/mL, AFP 9 (1-10) ng/mL] were on effective ETV treatment. All patients had severe portal hypertension [platelets 27 (26-38)*10^3/mmc, spleen 21 (17-26) cm, liver and spleen stiffness 25 (17-30) and 44 (28-45) kPa] with esophageal varices, previously band-ligated in 2. During the median 24 (20-32) weeks of BLV treatment no adverse events occurred, all patients achieved virological response (≥ 2 Log10 HDV-RNA decline) including two with undetectable HDV-RNA. CPT and MELD remained stable [B8 (B7-B8) and 16 (14-17)], there was an improvement in quality of life (EQ-5D-3L and VAS) and on LFTs compared to baseline [ALT 35 (30-50) *vs* 61 (35-79) U/L, AST 41 (32-74) *vs* 67 (35-105) U/L, bilirubin 2.5 (2.6-3.1) *vs* 2.5 (2.5-4.7) mg/dL, albumin 3.4 (3.2-3.7) *vs* 3.3 (3.2-3.4) g/dL, PCHE 3,051 (2,232-6,081) *vs* 2,498 (2,250-5,336) U/L, INR 1.6 (1.4-1.8) *vs* 1.7 (1.4-1.9)] and an asymptomatic increase of biliary acids: 112 (102-138) vs 55 (22-69) µmol/L.
Conclusions
BLV use in most advanced CHD cirrhotic patients is safe and showed a virological response and a progressive biochemical and clinical improvement postponing the need for LT.
Conflicts of interest
Alessandro Loglio speaker for Gilead sciences.Mauro Viganò speaker for Gilead sciences.

PP16

MicroRNA profile as biomarker of liver injury in different types of liver donor

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Background
Grafts from donors after circulatory death present disparate results in terms of post-transplant complications and survival. Certain microRNAs have emerged as potential early biomarkers of liver injury in the context of transplantation. Finding markers of graft viability will provide objective measures to expand the use of marginal donors. The objective of this study is to analyze the expression of microRNAs in different types of donors.
Methods
Prospective, observational, single-center study that quantifies the expression of hepatotoxic miRNAs (miR-122, miR-148, miR-155, miR-22, miR-222) by RT-qPCR in serum, liver tissue and perfusion fluid in different liver donors between 2019 and 2021. Normalization of the samples is carried out using endogenous microRNAs (miR-103a, miR-191, miR-16, miR-30, miR-let7a) and the relative expression between groups is calculated with the method 2^(−ΔΔCq).
Results
10 donors after brainstem death (DBD) and 10 donors after circulatory death (DCD) with normothermic regional perfusion (NRP) are compared with no demographic or liver function differences. In the post-transplant setting, both groups are comparable in terms of early allograft dysfunction (2 (20%) Vs 2 (20%); p 1.0), CCI index (10.59 Vs 23.86; p 0.114) and survival (8(80%) Vs 10(100%), p 0.474), in DBD and DCD respectively. In preservation solution, the relative expression of miR-148, miR-222 and miR-22 is 3.03 (p 0.02), 1.97 (p 0.03) and 2.23 (p 0.04) higher in DBD than DCD. In liver biopsy and serum, there are no differences in expression between donors.
Conclusions
The relative expression of hepatotoxic microRNAs does not show differences between brain-dead donors and donors after circulatory death with NRP in liver tissue or serum. In the back-table, the preservation solution presents a differential expression of miR-148, miR-222 and miR-22 that could correspond to down-regulation in DCD or up-regulation in DBD as an early biomarker of liver injury.
Conflicts of interest
No conflicts declared
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PP17

Using Perfusate as an Effective Tool for Improving Liver Graft Preservation for Transplantation Purposes

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Background
Efficient preservation of steatotic livers during liver transplantation (LT) is vital to minimize ischemia-reperfusion injury (IRI), which occurs during liver extraction and static preservation before LT. The challenge lies in integrating stages to mitigate IRI and enhance graft quality. Preservation solutions play a crucial role in improving graft quality at all LT stages, starting with static preservation. In this study, we examined the biochemistry of perfusate from obese Zucker rat livers after 24 hours of cold storage at 4°C, using University of Wisconsin (UW), Histidine-Tryptophan-Ketoglutarate (HTK), and IGL-2 solutions. We slightly modified the IGL-2 solution, naming it IGL-2M, to improve stability.
Methods
Male obese Zucker rat livers underwent 24 hours of cold storage at 4°C using UW, HTK, IGL-2, and IGL-2M, with a SHAM group following identical procedures without preservation. Rinsing with Ringer's solution generated eluates for analyses. Key parameters (ALT, AST, GLDH, lactate, nitrites, nitrates, uric acid, syndecan, succinate, pH, glucose, ATP, and oxidative stress) were evaluated.
Results
HTK preservation led to significantly higher levels of transaminases (ALT, AST), GLDH, uric acid, and oxidative stress. IGL-2M, unlike IGL-2, showed increased nitrites and nitrates. UW resulted in elevated syndecan levels, possibly linked to glycocalyx degradation. IGL-2 and IGL-2M exhibited similar succinate release, highlighting comparable outcomes.
Conclusions
Examined markers provide potential utility in assessing hepatic status through eluate analyses. IGL-2 and IGL-2M, with PEG35, show promising results, characterized by lower oxidative stress and improved preservation. Evaluation of eluates can be extended to perfusion solutions during HOPE to determine the quality of the graft and preservation.
Conflicts of interest
No conflicts declared

PP18

Liver transplantation in patients with surgical contraindication for portal vein anatomy treated with portal vein recanalization via transjugular intrahepatic portosystemic shunt: a single center experience

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Background

Despite advances in surgical technique for liver transplantation (LT), there are still absolute contraindications with respect to portal vein (PV) anatomy. Thrombosis, hypoplasia, and cavernomas may therefore preclude LT regardless of the clinical indication. Transjugular intrahepatic portosystemic shunt (TIPS), a procedure intended to treat complications of portal hypertension, may be a possibility for PV recanalization in this population.

Methods

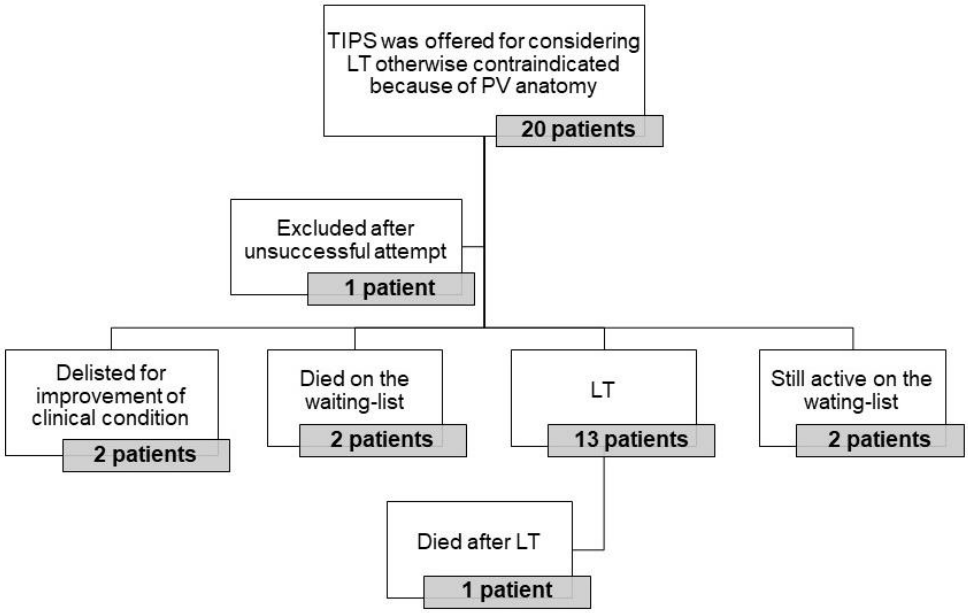
to describe our single-center experience of PV recanalization via TIPS in patients who are candidates for LT due to clinical conditions but deemed contraindicated because of PV anatomy. We included consecutive patients undergoing TIPS at our center from February 2014 to October 2023. Patients with previous LT were excluded. Clinical variables at TIPS placement and LT were collected.

Results

we found 20 patients (15 male, mean age 57±6 years) in which TIPS was offered for considering LT otherwise contraindicated because of PV anatomy. Five showed PV thrombosis, 7 had PV hypoplasia because of voluminous porto-systemic shunts, and 8 had cavernoma. Indication to LT was mainly driven by hepatocellular carcinoma history (5 treated and 4 with active cancer at the time of TIPS), whereas mean Model for End-Stage Liver Disease (MELD) was 16±3. TIPS was successfully placed in all but one patient. In 7 patients a trans-splenic access was adopted and in one subject a mesenteric one. Concurrently, 6 patients underwent porto-systemic shunts closure through endovascular procedures. All the patients were listed after TIPS with MELD value at listing higher than pre-TIPS-MELD (23±5 vs.16±3, $p<0.001$). Overall, two patients were delisted for improvement of clinical condition, two died on the waiting-list (WL), 13 underwent LT, while two are still on the WL. LT was technically feasible in all patients, without major periprocedural vascular complication. One patient died 141 days after LT because endocarditis, while another was successfully re-transplanted because of primary non-function.

Conclusions

TIPS may be a strategy to make LT possible in patients otherwise excluded due to PV characteristics. This approach needs high technical expertise and often at the expense of a worsening in liver function.



Abbreviations: TIPS: transjugular intrahepatic portosystemic shunt; PV: portal vein; LT: liver transplant

Figure 1. Flow chart of the study population.

Conflicts of interest

No conflicts declared

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PP20

100 Hypothermic Oxygenated Perfusion liver transplants in a Portuguese centre

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Background
Machine perfusion is a novel method for graft preservation before transplant. Hypothermic oxygenated perfusion reveals promising results concerning the lower complication rate, further allowing the use of extended criteria grafts. Previous non-anastomotic biliary strictures (NAS) incidence in our centre was 16.7%. This work presents the results from the first 100 HOPE cases in a portuguese liver transplant centre.
Methods
Between august 2020 and july 2023, HOPE was used efectively in 100 liver transplants. We analyzed data from the donor, graft and receptor, as well as data from the intraoperative and postoperative period. Furthermore we analyzed the development of non-anastomotic strictures (NAS), after excluding arterial complication patients and biliary cast syndrome.
Results
Recipients: 80% male, median age 62 years (IQR 55-66), MELD-Na 17 (IQR 11-24), transplanted for HCC in 45% of cases, 3% retransplants. Donors: median age 72 years (IQR 60.5-76.5) (18% aged ≥80 years), median BMI 26.62 Kg/m2 (IQR 24.30-29.07), 100% DBD, D-MELD ≥1600 in 20%. Median CIT of 231.5 (IQR 192.5-258.5)), and CIT+HOPE of 368 (IQR 344-412). There was 1 case of primary graft failure. Median peak AST 778.5 U/L (IQR 506.75-1606.0), peak ALT 657.5 U/L (IQR 386.75-1222.0), 7th day Bilirubin 1.5 mg/dL (IQR 0.9-3.0), and 7th day INR 1.12 (IQR 1.06-1.23), with 17 cases of early graft dysfunction (of these, none had graft loss). There were 57 cases of ischemia-reperfusion injury. The incidence of NAS was 6.98% (N=86). In the analysis of cases with > 6 months of follow-up (N=65), the incidence was 7.69% (N=65).
Conclusions
HOPE allowed for more extended criteria grafts utilization, and we emphasize good graft function on the immediate postoperative period. Also, NAS rate decreased in our centre.
Conflicts of interest
No conflicts declared

PP22

Alcoholic aetiology and severity of liver disease is correlated with worse Stanford Integrated Psychosocial Assessment for Transplant (SIPAT) in liver transplant candidates (LT) and correlates with post-transplant adherence

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Background
The SIPAT is a validated interview tool to assess psychosocial well-being in candidates for organ transplantation. Adherence to immunosuppression and clinical follow-up is essential to obtain maximum survival benefit. ALD can decrease candidacy for LT and post-transplant compliance with physicians' prescriptions.
Methods
We retrospectively analysed (2019-2022), 163 candidates for liver transplantation, 134 finally enrolled, with median (DS) age 57,8 yrs (9,5), MELD score 13,9 (6,3), ALD aetiology 50%, clinical significant portal hypertension 78%. All patients underwent administration of SIPAT during evaluation for LT. Correlations between final admission to the waiting list for LT, clinical characteristics, SIPAT, outcome of those transplanted and evaluation of adherence to immunosuppression by the analysis of the Medication Level Variability Index (MLVI) were performed.
Results
During evaluation for LT, 77/134 (57%) were considered at high risk according to SIPAT lever ≥ 21, which significantly correlated with MELD score, ALD aetiology (70%), presence of encephalopathy (28%) and age. 85 patients were listed for LT, and 51 were transplanted; amongst those, 25/51 (49%) showed an MLVI higher than 1.8, suggestive of non-adherence to immunosuppression. In these patients, 68% had a SIPAT score ≥ 21 prior LT. During follow-up, there was only a single recidivism of alcohol abuse (2%).
Conclusions
Patients with worse psychosocial characteristics also have higher MELD scores, thus to be prioritised for LT, but possibly less adherence to medical prescriptions after transplantation. This specific subset of patients could be submitted to early psychological pre-habilitation before LT.
Conflicts of interest
No conflicts declared
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PP23

Cognitive impairment in liver transplant candidates – the role of blood ammonia level and three-point evaluation of brain MRI – a single liver transplant center pilot study

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Background
Some patients present varying degrees of cognitive impairment (CI) after liver transplantation (LT) and up to 30% of LT recipients still have neurological sequelae, suggesting other that hepatic encephalopathy (HE) origin of central nervous system damage.
Methods
To focus on the role of hyperammonemia and routine evaluation of brain MRI in consecutive LT candidates with alcohol-use-disorder (AUD) related liver cirrhosis in single transplant center we included 52 adults (male 36 (69%), mean age 51±11 years, mean MELD score 16±6 points) with AUD reported as potential candidates for LT treatment. Cognitive function was assessed using the Addenbrooke Cognitive Test III (ACE III) with cut-off < 82 points for a high probability of dementia. Data regarding their Child-Pugh (CPC) and MELD scores and blood ammonia levels were collected. Routine three-point description of brain MRI included assessment of cortical-subcortical atrophy of the brain, semi-quantitatively assessed vascular-origin changes and features of chronic HE.
Results
In total, 73%, 62% and 29% of patients had radiological changes in brain MRI related to HE, vascular-origin changes and cortical-subcortical atrophy of the brain, respectively. Moreover, 46 (88%) patients had impaired cognitive results assessed by ACEIII and 30 (58%) met the criteria for suspected dementia. Ammonia blood level in the entire cohort was 93±67 µg/dl with hyperammonemia in 24 (46%) individuals. Patients with radiological signs of HE had lower score in language subdomain of ACEIII (p=.033) and a trend with higher CPC (p=.083). There were no differences comparing clinical data and ACEIII results in patients with and without vascular-origin changes and cortical-subcortical atrophy in MRI. Moreover, there were no correlations between radiological impairment and ammonia level, ACEIII results, as well liver-related death.
Conclusions
These preliminary data indicate a disturbing frequency of severe cognitive impairment bordering on dementia and substantial frequency of radiological impairments in brain MRI of patients with AUD at listing to LT. However, the findings of routine three-point MRI neuroimaging were not linked with clinical variables i.e. ammonia or cognitive screening test, with limited usefulness in these issues.
Conflicts of interest
No conflicts declared

PP24

Maximum liver function capacity test (LiMAx) during abdominal normothermic regional perfusion as predictor of graft function after transplantation

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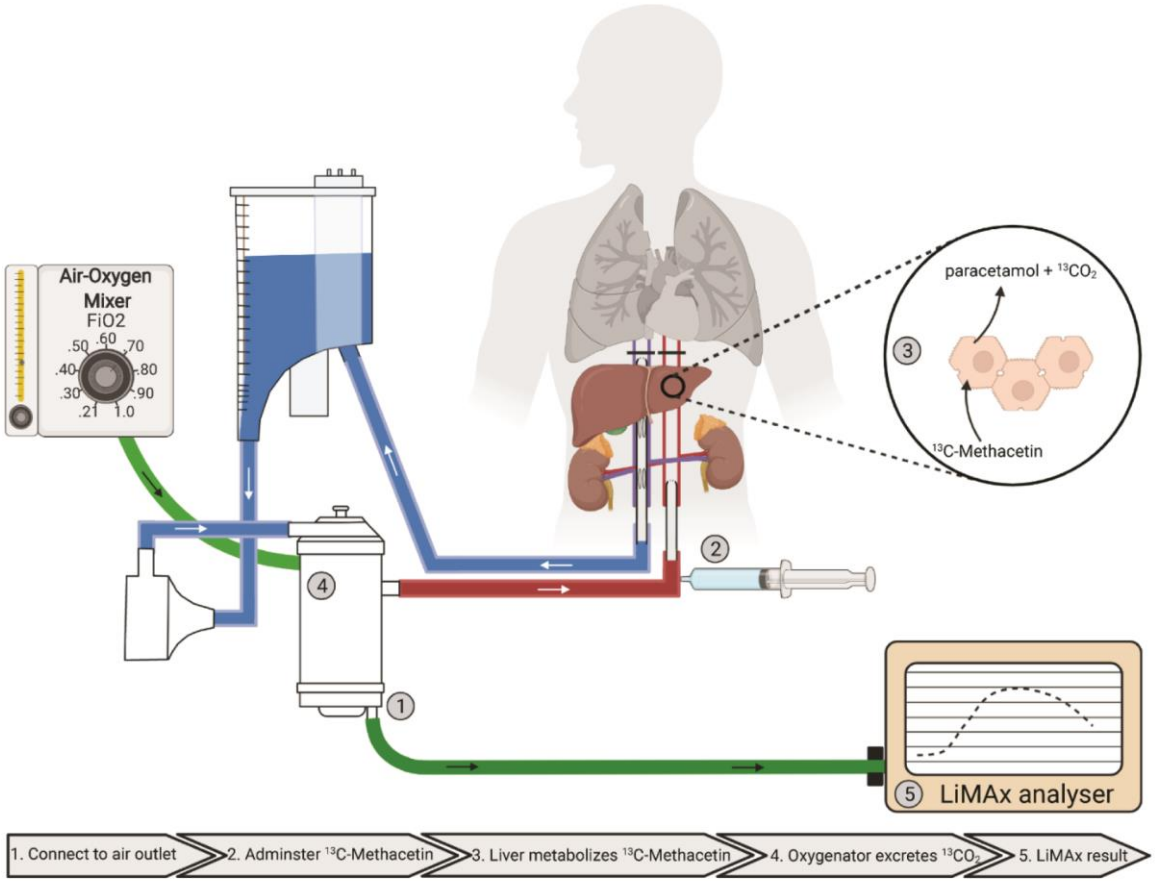
Background
Abdominal normothermic regional perfusion (aNRP) enables assessment of donor liver viability during donation after circulatory death (DCD). However, a gold standard to evaluate liver function is lacking, and livers are usually subjectively assessed, with the risk of under-utilization. We aimed to assess the value of the maximum liver function capacity (LiMAx) test to objectively grade liver function during aNRP.
Methods
aNRP was performed for salvage of extended criteria DCD liver grafts in 18 donors. After one hour of aNRP, the LiMAx test was performed, using the aNRP circuit.
Results
The LiMAx test was performed successfully in 17 aNRPs (94%). During aNRP, LiMAx scores of livers with good lactate clearance were significantly higher compared to livers with impaired lactate clearance (396(301-451) versus 105(70-158) µg/kg/h; P=0.006). Furthermore, livers that demonstrated a stress hyperglycemia peak (>20mmol/l glucose) had a higher LiMAx score compared to grafts without glucose peak (P=0.032). LiMAx scores significantly correlated with ALT (R=-0.755; P<0.001) and AST (R=-0.800;P<0.001) levels at the end of aNRP. LiMAx scores of 13 transplanted grafts were significantly higher compared to 4 non-transplanted grafts (397 (346-453) versus 155 (87-206) µg/kg/h; P<0.001). Transplantation was successful in 12 recipients, as one recipient suffered from portal vein thrombosis, resulting in graft loss. LiMAx scores during aNRP did not correlate with post-transplantation hepatic injury markers, but it significantly correlated with lactate levels at 24 hours (R=-0.585; P=0.045).
Conclusions
The feasibility of LiMAx testing during aNRP provides a comprehensive reflection of both injury and function, suggesting its potential as an objective tool in the decision-making process concerning the acceptance of extended criteria donor livers



Conflicts of interest
No conflicts declared

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PP25

Characterization of the changes in the liver ex-situ bio-molecular phenotype and metabolism during rat NMP

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Background
Viability assessment during ex situ normothermic perfusion (NMP) should be based on ex situ liver metabolism rather than in vivo derived parameters. However, the partial understanding of the biological events that occur during NMP, especially during prolonged perfusion, may hinder the proper assessment of liver viability. The aim of our study was to implement a rat model of NMP to characterize the specific changes on biomolecular phenotype and metabolism due to ex-situ perfused organs.
Methods
Livers (n=5/group) were procured and subjected to 4h (NMP4h) or 12h (NMP12h) NMP using a perfusion fluid supplemented with an acellular oxygen carrier. Organs not exposed to any procedure served as controls (Native).
Results
All perfused organs met clinically derived viability criteria at the end of NMP. Factors related to stress response and survival were increased after prolonged perfusion. No evidence of oxidative damage was observed in either NMP group. Evaluation of metabolite profiles showed a shift in liver metabolism throughout the perfusion time, which was peculiarly different from the Native group. Indeed, while mitochondrial function was preserved, activation of the Cori cycle, induction of lipolysis, acetogenesis and ketogenesis in the liver became evident over time. Increased levels of metabolites involved in glycogen synthesis, glucuronidation, bile acid conjugation and antioxidant response were also observed.
Conclusions
In conclusion, profound changes in cellular homeostasis were demonstrated to maintain a newly developed equilibrium, although liver viability and function were preserved during 12 hours of perfusion. These events suggest not only the need for specific ex-situ viability criteria based on the deep investigation of this new homeostasis, but also the need to maintain ex-situ metabolism to avoid detrimental effects of NMP on graft quality.

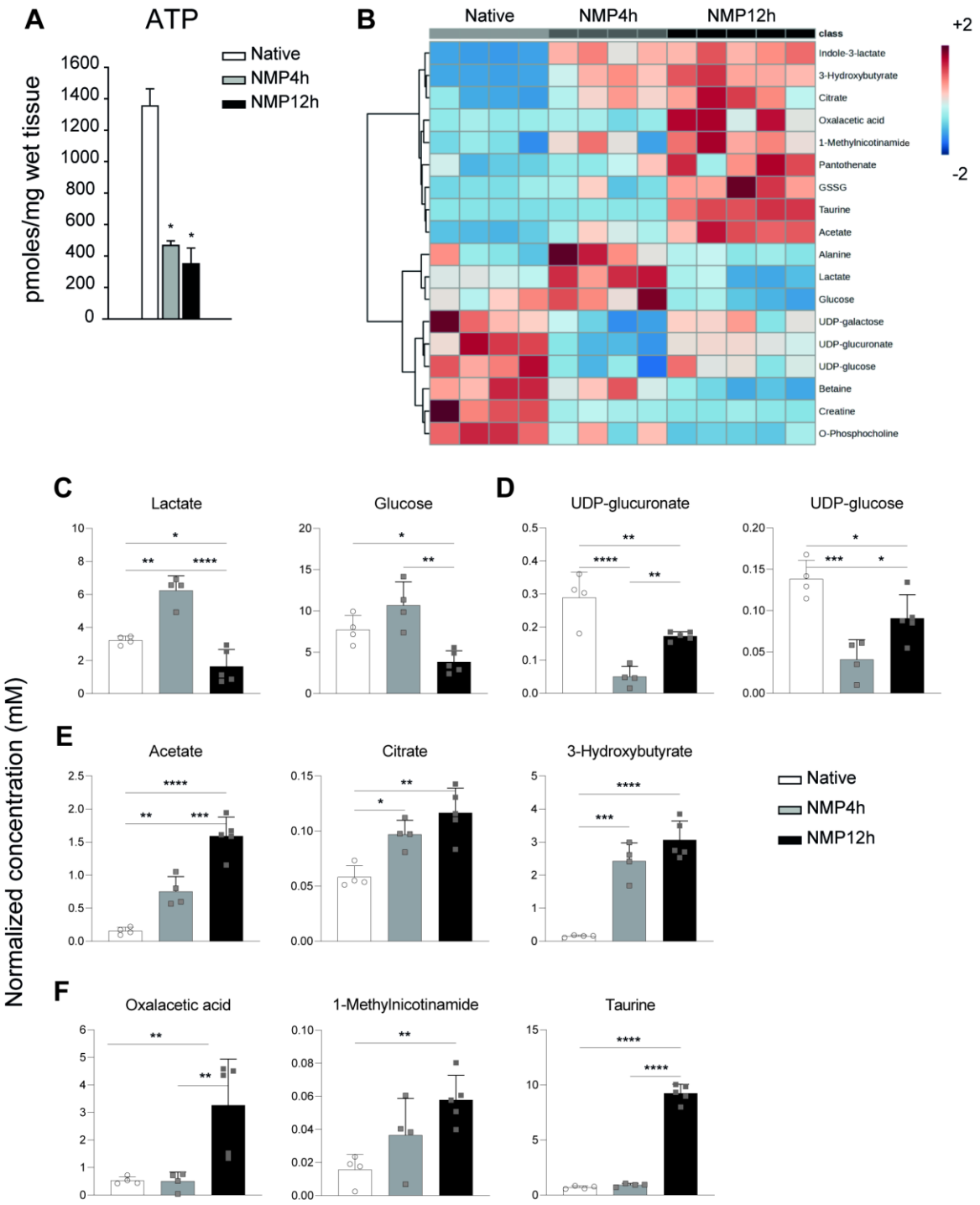

Figure 1. Cell metabolism and energy charge in livers subjected to NMP compared to Native group.
A) ATP content in liver tissue biopsies.Bars denote mean±SEM; One-way ANOVA, Tukey's post hoc test; p value vs native: *p<0.05 NMR spectroscopy-based metabolomic analysis was performed to assess the concentration of specific metabolites in liver homogenates.
B) Top 18 significant metabolite heatmap illustrating individual sample metabolite concentration variation; Ward clustering algorithm, auto scaled concentration values between -2 and 2 (red - high, blue - low).
C) Energy metabolism-related metabolites lactate and glucose showed a reduced concentration in livers exposed to prolonged NMP.
D) UPD-glucuronate and UDP-glucose content was lower in perfused organs compared to native livers.

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E) acetate, citrate, and 3-hydroxybutyrate were induced by both short-term and prolonged NMP.
F) oxalacetic acid 1-methylnicotinamide, and taurine displayed increased concentrations in the NMP12h group. Bar pots illustrate mean ± SD; One-way ANOVA, Fisher's post hoc test. White bar, white circles, native group; light grey bar, grey squares, NMP4h; black bar, grey squares, NMP12h. **** p<0.0001,*** p<0.001,** p<0.01, * p<0.05.

Conflicts of interest
No conflicts declared

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PP26

Impact of graft selection on short- and long-term outcomes of liver transplantation in recipients with Non-Alcoholic Steatohepatitis (NASH): The Toronto experience

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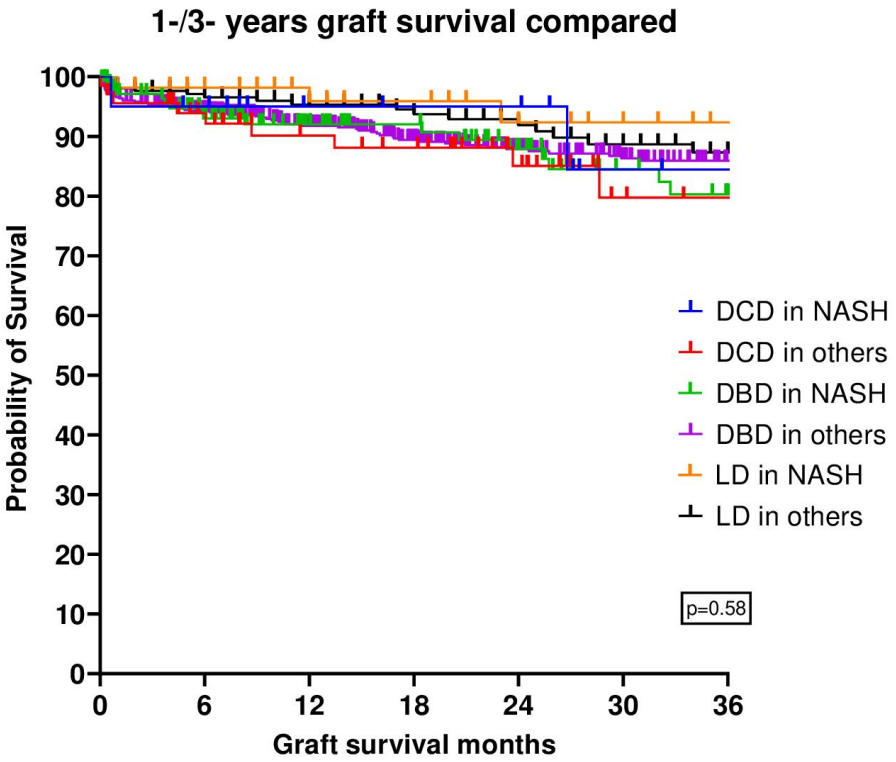
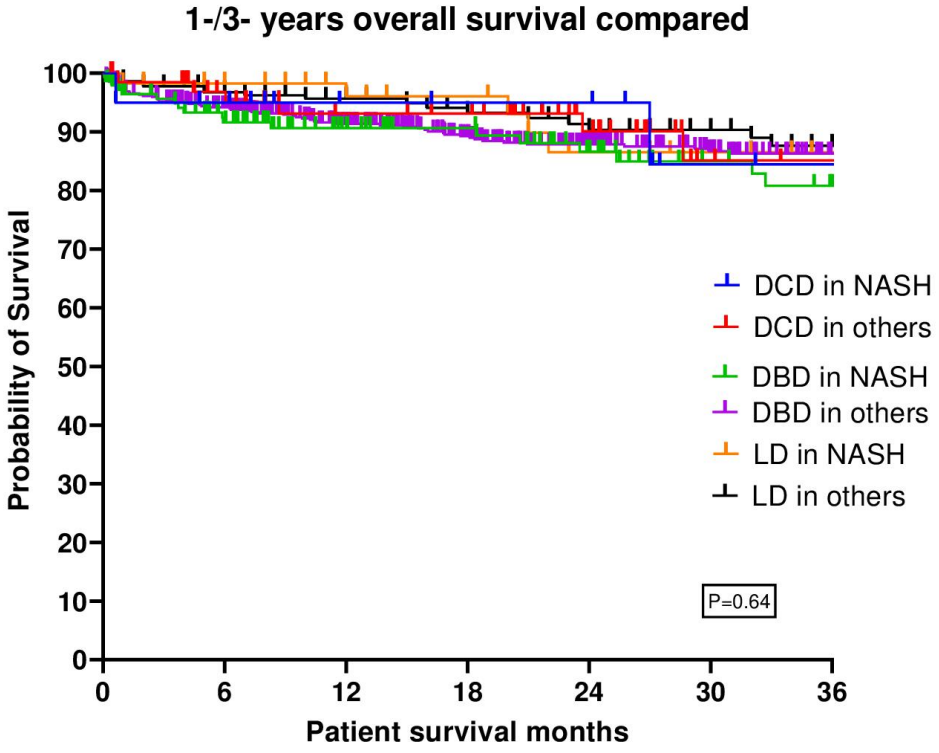
Background
Increasing prevalence of Non-Alcoholic steatohepatitis (NASH) has made it one of the leading indications of liver transplantation in North America and worldwide. However, there is paucity of existing literature on effect of graft selection on outcome of liver transplantation in patients with NASH.
Methods
This was a single-centre study from January 2016 to December 2021. The cohort was divided into donation after brain death (DBD), donation after cardiac death (DCD) grafts and Living donor (LD) groups and further subdivided into recipients with and without NASH.
Results
Of the total 807 patients undergoing deceased donor liver transplant (DDLT), 170 (21%) had underlying NASH, 2.5% from DCD donors (n=20) and 18.6% from DBD donors (n=150). In LD cohort (n=292), 59 recipients had underlying NASH (20.2%). There was no difference in the incidence of biliary strictures in recipients with NASH vs those without in all 3 groups (DCD: 20% vs 13.2%, p=0.48; DBD: 6.7% vs 5.8%; p=0.67 and LD: 13.5% vs 10.7%; p=0.35). The 1- and 3- year graft survival rates were similar between recipients with NASH vs without NASH (Figure 1). There was no significant difference between the Overall patient survival as well (Figure 2). Cox proportional hazards model in DDLT cohort revealed a significant association of underlying NASH with advanced donor age (HR: 1.032 95% CI: 1.004-1.062; per 10 years increase in donor age, p=0.01) in impacting graft survival.
Conclusions
Patients with underlying NASH have comparable outcomes of liver transplantation (both deceased donor and living donor) with those without NASH, although advanced donor age could be a potential deterrent while donor selection for these patients.



Comparison of 1- and 3- year graft survival between DBD, DCD and LD cohorts in recipients with and without NASH (Log rank test)



Comparison of 1- and 3- year overall patient survival between DBD, DCD and LD cohorts in recipients with and without NASH (Log rank test)

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Conflicts of interest
No conflicts declared
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PP27

Histology assessment of liver biopsies during normothermic machine perfusion - correlation with viability parameters

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Background
The objective of normothermic machine perfusion (NMP) in liver transplantation is to minimise ischemia/reperfusion injury and allow the use of more marginal grafts. Lactate clearance, pH, and bile analysis have become common in assessing graft viability during NMP, but evaluation of liver biopsies is not standard. This analysis aimed to histologically assess pre-NMP, post-NMP and post-transplant biopsies and correlate the findings with traditional markers of viability and post-transplant outcome.
Methods
Liver biopsies obtained from DBD (n=30) and DCD (n=15) liver grafts underwent NMP with Metra device (Organox). Pre-NMP, post-NMP, and post-reperfusion biopsies were graded for neutrophil clusters (G0-G5), necrosis (G0-G8), and small droplet steatosis (G0-G4) described by T Vogel et al. Sequential histological findings were correlated with viability criteria and post-transplant outcome.
Results
40% (12/30) of DBD and DCD (6/15) grafts had a routine post-transplant course with no sequential histological changes identified on assessment.50% (15/30) of DBD and 53% (8/15) of DCD grafts had moderate histological changes on sequential analysis.This consisted of an increase in cell death between biopsies taken pre- and post-NMP and a moderate increase in neutrophil infiltration between biopsies taken post-NMP and post-reperfusion. These grafts met the viability criteria and were characterised by elevated transaminitis (mean peak AST: DBD:2564(1066-9474); DCD: 3244(1071-9428)). All patients had a routine postoperative course.
10% of DBD (3/20) and <1% of DCD (1/15) had significant graft dysfunction requiring retransplantation. Marked histological changes were identified in all grafts. An increase in cell death was observed between pre- and post-NMP biopsies from (G0 to G5) and then between post-NMP and post-reperfusion biopsies from (G5 to G7). The same biopsies showed no increase in neutrophil infiltration between pre-and post-NMP but an increase in neutrophils in post-reperfusion biopsies. All four livers met viability criteria and had a mean peak AST of 3637(1272-3969).
Conclusions
Increased cell death between pre-and post-NMP could be another pre-transplant marker of graft viability. Neutrophil infiltration in post-transplant biopsies is associated with severe graft dysfunction.
Conflicts of interest
No conflicts declared

PP28

A meta-analysis comparing viability assessment criteria during normothermic machine perfusion and transplant outcomes of DCD and DBD livers

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Background
Liver grafts from donation after circulatory death (DCD) are utilized less often than donation after brain death (DBD). Normothermic machine perfusion (NMP) provides an opportunity to assess grafts prior to transplantation. It is unclear whether commonly adopted viability parameters accurately predict clinical outcome between donor types. Therefore, the aim of this meta-analysis was to compare viability assessment criteria and transplant outcomes of DCD and DBD livers subjected to NMP.
Methods
PubMed, Web of Science, EMBASE, and the Cochrane Library were searched for publications reporting livers placed on NMP, during which metabolic and perfusion parameters are used for viability assessment prior to transplantation. Out of 625 unique articles, 12 were included in this meta-analysis. Effect size (ES) was calculated using Cohen's d and log odds ratio. When I2 was 0.5 or lower, a fixed effects model was used, otherwise, a random effects model was used to account for heterogeneity.
Results
A total of 382 livers subjected to NMP, of which 179 DBD and 203 DCD were analyzed. DBD livers had longer cold ischemia times (ES: 0.51, I2=0.07, p<0.001), however, there were no significant differences in donor age, BMI, liver weight or machine perfusion duration. Furthermore, the only binary viability assessment criterion which differed was bile production, 83.5% of DBD livers produced bile compared to 70.2% of DCD livers (ES:0.93, I2=0.36, p=0.004). After viability assessment, DBD livers where transplanted significantly more often than DCD livers, with 81.6% and 71.9% utilization rates, respectively (ES:0.55, I2=0.29, p=0.03). Post-transplantation, there were no significant differences in clinical outcomes, such as early allograft dysfunction (ES:-0.08, I2=0.00, p=0.822), non-anastomotic strictures (ES:-0.60, I2=0.00, p=0.115), one-year death censored graft (ES:0.73, I2=0.00, p=0.325) and patient survival (ES:-0.10, I2=0.00, p=0.908).
Conclusions
DBD livers were transplanted more often than DCD livers after NMP, with only small differences in viability assessment criteria and perfusion parameters. Livers from both donor types had very similar post-transplant clinical outcomes. This study suggests that potentially more livers will be accepted for transplantation by using viability assessment during NMP without rejecting grafts due to donor criteria.
Conflicts of interest
No conflicts declared

PP29

Single center evolution of DCD donor utilization for liver transplantation: from perceived marginality to routine and beyond

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Background
Donation after circulatory determination of death (DCD) has raised concerns in the past due to adjunctive donor warm ischemia, which can have detrimental effects on liver graft function. In Italy those grafts have been long considered marginal, as the legislation imposes 20 minutes of no-touch time before harvest. The aim of this study is to assess DCD donor utilization for liver transplantation at a single center from the beginning of DCD program, to evaluate if increasing experience has influenced the utilization of those organs.
Methods
Consecutive recipients of liver transplant from DCD donors have been prospectively enrolled for the study from 2016 to 2023. The patients have been categorized in two eras, from 2016 to 2021 and after 2021, and compared to assess donor and recipient characteristics, as well as liver transplantation outcomes.
Results
Seventy three (73) recipients have been enrolled, 44 of which (60.3%) have been transplanted in the second era. During the second era, we transplanted recipients with higher Liver Transplant Risk Score (1 [0-2] vs. 1 [0-1], p=0.007) utilizing more often extended criteria donors (95.5% vs. 75.9%, p=0.025) and donors with higher age (median 72 vs. 62, p=0.010), number of extended criteria (median 2 vs. 1, p=0.004) and EuroTransplant Donor Risk Index (median 3.05 vs. 2.66, p=0.011). Graft function and survival, as well as surgical complications, results comparable between the two eras.
Conclusions
With increasing experience in managing DCD donors and recipients it was possible to utilize more marginal donors and perform transplantation in recipients at higher risk, maintaining similar outcomes
Conflicts of interest
No conflicts declared

PP30

The effect of donor and donation parameters and viability assessment criteria during normothermic machine perfusion of the liver on the decision to transplant: a meta-analysis

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Background
During normothermic machine perfusion (NMP), a variety criteria are used to gauge the suitability of an organ for transplantation. However, the influence of donor and donation factors on these criteria are poorly understood. The aim of this meta-analysis was to investigate the effect of donor and donation parameters and viability assessment criteria on the decision to transplant a liver subjected to NMP.
Methods
A comprehensive search was performed in PubMed, Web of Science, EMBASE, and the Cochrane Library for publications reporting livers placed on NMP, during which metabolic and perfusion parameters are used for viability assessment prior to transplantation. Out of 625 unique articles, 11 were included in this meta-analysis. Effect size (ES) was calculated using Cohen's d and log odds ratio. When I2 was 0.5 or lower, a fixed effects model was used, otherwise, a random effects model was used.
Results
A total of 374 livers were subjected to NMP and following viability assessment 283 were transplanted and 91 were rejected. Livers from donors after brain death (DBD) were transplanted significantly more frequently than livers from donors after circulatory death (DCD) (ES: 0.657, I2=0.41, p=0.011). Furthermore, livers with shorter cold ischemia time (CIT) (ES: -0.301, I2=0.08 p=0.015) and lower liver weight (ES: -0.535, I2=0.14, p<0.001) were transplanted more often. Donor age (ES:-0.138, I2=0.00, p=0.262), BMI (ES:0.103, I2=0.89, p=0.891) and warm ischemia time (WIT) (ES:0.08 , I2=0.00, p=0.640) did not differentiate between livers accepted for transplantation and those rejected after viability assessment during NMP. Significant binary viability assessment criteria include lactate clearance (ES:2.32, I2=0.50, p<0.001), glucose metabolism (ES:2.31, I2=0.00, p<0.001), perfusate pH (ES:3.00, I2=0.00, p<0.001), bile pH (ES:1.97, I2=0.00, p<0.001) and bile production (ES:1.01, I2=0.00, p=0.003).
Conclusions
After viability assessment during NMP, livers from DBD donors, with shorter CIT and lower weight were transplanted more often. Donor age, BMI and WIT did not differ significantly between the transplanted and rejected groups. This study suggests that donor characteristics that determine clinical outcome are not necessarily equivalent to factors predicting the decision to transplant during NMP.
Conflicts of interest
No conflicts declared

PP31

Acute-on-chronic liver failure in severe acute alcoholic hepatitis: impact on management, prognostication, and urgency of liver transplantation

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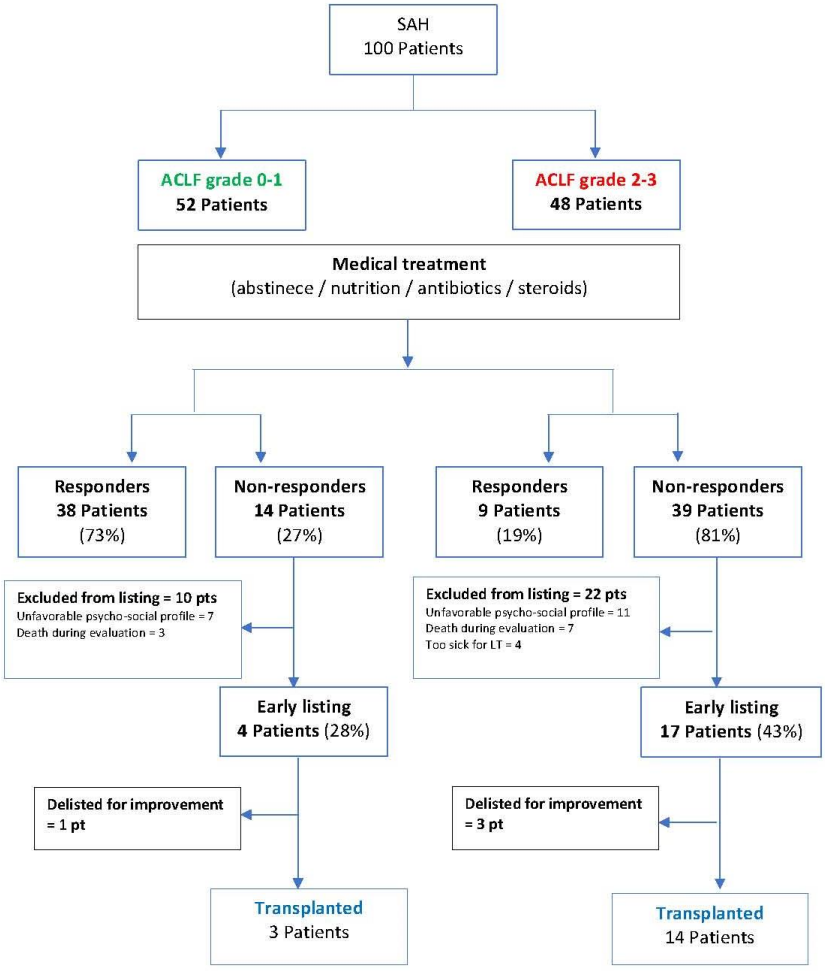
Background
A better identification of factors predicting the course, outcome, and need for urgent liver transplantation in patients with severe acute alcoholic hepatitis (SAAH) is needed. Acute-on-chronic liver failure (ACLF) can occur in SAAH, and its impact on management, prognostication, and need for urgent liver transplantation in SAAH should be clarified.
Methods
Aim of the stusy is to to describe the impact of ACLF on management, prognostication, and need for urgent liver transplantation in SAAH. Patients with SAAH referred to our center between April 2016 and May 2023 had been considered, with those non-responders to medical treatment (MT) being evaluated for LT
Results
One hundred patients were included, with a median Maddrey Discriminant Function of 72 and a median MELD-Na score of 28. At presentation, 52 patients had ACLF grade 0-1, and 48 ACLF grade 2-3 (31 grade 2, 17 grade 3) (see Figure 1). In the latter group, circulatory failure was present in 3 (6.25%), and respiratory failure in 4 (8.3%). SAAH was the only precipitant factor in 50 (96%) and 36 (75%) patients with ACLF grade 0-1 and ACLF grade 2-3, respectively, with infection being an associated factor in 1 (2%) and 8 (17%), and GI bleeding in 1 (2%) and 5 (10%), respectively.
Non-response to MT was significantly higher in patients with ACLF grade 2-3 (39/48, 81%) than in those with ACLF grade 0-1 (14/52, 27%). ACLF grade 2-3 was associated with a corresponding higher need of early LT (ACLF grade 2-3: 14/48, 29% vs ACLF grade 0-1: 3/52, 5.7%; p = 0.004).
ACLF status at presentation (ACLF grade 2-3 vs ACLF grade 0-1) resulted a better predictor of outcome (death or LT) than MELD-Na (>= or <30) (4.42 [2.67; 7.33] vs 2.50 [1.51; 4.12]).
Conclusions
ACLF is a frequent presentation of SAAH. Severe ACLF predicts non-response to MT, indicating the urgency of liver transplantation.

Figure 1



Conflicts of interest
No conflicts declared

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PP33

Exploring the Impact of HDV Co-infection on Hepatocellular Carcinoma Outcomes in Liver Transplant Patients from Romania

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Background
Hepatocellular carcinoma (HCC) is continuously increasing as indication for liver transplantation (LT) in Romania. The impact of the HDV virus on the likelihood of developing HCC is a subject of debate, with some arguing in favour of an elevated risk of HCC occurrence in the presence of HDV co-infection, while others oppose this notion.
Methods
We retrospectively analyzed the outcomes of a consecutive cohort of 263 patients (70.9% males, median age 56 years) transplanted for HCC and followed-up for 5 years (until December 2023) for overall survival and HCC recurrence, separated in 2 time periods 2001-2017 and 2018-2023. The aim was to analyze the changing pattern of HCC as indication for LT, as well as the effect of HBV-HDV co-infection on overall survival and HCC recurrence following LT in patients with HCC transplanted in Romania since 2001.
Results
Patients from the last 5 years had the following characteristics: lower number of intraMilan tumors (p=0.07, marginal significance); older patients (p=0.0004); higher HBV/HDV (p=0.02) and alcohol etiology (p=0.001) and lower HCV-related HCC (p=0.01); higher MELD score (p=0.03). Overall patient survival was 82.9% at 1 year, 59.8% at 5 years of follow-up. There was no survival difference between patients with HBV/HDV and other etiologies (p=0.17); however at 1 years and 5 years the overall survival in HBV/HDV/HCC cohort was 84% and 65.4%. The independent risk factors for the whole cohort for overall mortality at 5 years after LT were: HCC recurrence (p<0.0001), number of nodules (p=0.04), AFP value (p=0.008), but etiology of liver cirrhosis had no influence. When analysing only patients with HBV and HDV coinfection, the single independent risk factor for survival was HCC recurrence.
Conclusions
HBV/HDV coinfection alone has no effect on the post-transplant HCC overall survival or HCC recurrence. Other factors that influence HCC recurrence related to tumor biology should be further investigated in our transplanted patients.
Conflicts of interest
No conflicts declared

PP34

A Long Wait for Those with a Short Gut: An increasing challenge in Paediatric Intestinal Transplantation in the UK

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Background
Intestinal transplant (IT) is the standard of care for intestinal failure (IF)
Methods
Retrospective case review of paediatric patients referred for consideration of intestinal transplant from 1998-2024 in a single centre in the UK.
Results
44 children with intestinal failure were transplanted between 2009-2024.
Median age was 7 years (range 7 months- 16 years). Grafts included: 13 isolated small bowel (SB) (30%). 4 SB and colon (9%). 8 liver and SB (18%); 10 multivisceral transplants (23%); 1 multivisceral plus colon and kidney (2%);
2 were living donor grafts. 6 required retransplantation. Currently there are 9 patients active on the waiting list.
The one-, two-, and five-year survival is 93%, 86% and 71% respectively.
4 patients have died on our waiting list, of which, 2 died in the last 24 months.
Median time on the waiting list was 215 days (range 13-1248 days). Due to the prolonged waiting times and severity of IFALD, a further 8 patients (18%), initially listed for small bowel and liver containing grafts, required an isolated liver transplant as a life-saving measure while awaiting suitable organs.
Conclusions
More recent surgical innovations in paediatric IT in our centre have included liver and bowel reduction transplants and living donor liver and SB transplant. Compared to data from the UK intestinal transplant registry from 2012-2022, time was almost 4 times higher in our cohort- median 215 days compared with 54 days in an adult population. As a life saving measure, isolated LT is being increasingly utilised in our centre in patients with severe IFALD awaiting IT. This is due to increasing wait times and increasing risk of mortality while awaiting suitable size matched grafts. In order to optimise successful outcomes in IT, increased paediatric donors and increased use of living related grafts are needed.
Conflicts of interest
No conflicts declared

PP35

Real-life assessment of long-term adverse events related to immunosuppression after liver transplantation: data from a cohort of patients followed-up in a non-transplant centre

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Background
Long-term exposure to immunosuppressive drugs and their cumulative adverse effects, including metabolic syndrome, cardiovascular events, and cancer, contribute to morbidity in liver transplant (LT) recipients. Minimisation of immunosuppression is a clinical mainstay, although its possible real-life beneficial effect has not yet been thoroughly investigated.
The aim of the study was to assess the impact of cumulative exposure to immunosuppressants (cyclosporine [CS], tacrolimus [TC], mycophenolate mofetil [MMF], and everolimus [EVL]) on post-LT dyslipidaemia, diabetes mellitus [DM], and hypertension, on major cardiovascular events, and on malignancy (non-hepatocellular cancer [HCC] and non-melanoma skin cancer [NMSC]).
Methods
All liver transplant recipients transplanted between January 1990 and June 2022 and followed-up at our clinic were retrospectively included in our study. Indications for combined EVL-TC therapy or EVL monotherapy were LT for HCC or moderate kidney impairment. Cumulative exposure to CS, TC, EVL and MMF was estimated by multiplying the time of exposure (years) by median values of trough levels or daily dosage in milligrams for MMF.
Results
A total of 236 patients were included in the study. The median duration of follow-up was 9 (4-14) years. Pre-LT smoking was the only factor associated with cardiovascular events (OR 3.6, p=0.04 – Table 1). Exposure to EVL vs no exposure was independently associated with dyslipidaemia (OR 2.4, p=0.04), regardless total exposure load. High exposure to EVL (>75° percentile) was independently associated with NMSC (OR 4.3, p=0.03). Prevalence of DM was higher in patients treated with TC (30.9% vs 17.2%, p=0.03).
Conclusions
Pre-LT smoking is associated with increased risk of cardiovascular events. Exposure to EVL and TC is linked to higher prevalence of dyslipidaemia and DM, respectively. These adverse effects appear to be manageable as they do not lead to increased cardiovascular risk. NMSC were more frequent in patients highly exposed to EVL.

	Cardiovascular disease				Univariate analysis	Multivariate analysis		
	Y		N					
	n/median	%/IQR	n/median	%/IQR	p-value	OR	CI	p-value
Age (years)	56	51-63	52	45-57	0.001	1.060	0.002-1.120	**0.042**
Post-LT hypertension	32	23.7	103	76.3	0.017	1.434	0.518-3.972	0.488
Post-LT diabetes	17	29.8	40	70.2	0.016	0.986	0.347-2.807	0.979
Post-LT dyslipidaemia	21	28	54	72	0.012	1.1468	0.570-3.783	0.426
Pre-LT smoking	23	23.3	76	76.8	0.064	3.630	1.092-12.065	**0.035**
Pre LT AUD	12	31.6	26	68.4	0.031	1.112	0.393-3.142	0.842
eEVL exposure >75° percentile	14	28.6	35	71.4	0.239			
eTC exposure >75° percentile	16	22.2	56	77.8	0.211			
eEVL exposure	24.8	16.0-33.0	20.0	9.3-39.7	0.530			
eTC exposure	37.5	20.3-56.7	27.2	14.0-43.4	0.114			

Table 1 *Multivariate analysis for cardiovascular disease. Abbreviations: Y=yes; N=no; IQR=inter-quartile range; OR=odds ratio; LT=liver transplantation; AUD=alcohol use disorder; e=estimated; EVL=everolimus; TC=tacrolimus*

Conflicts of interest
No conflicts declared

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PP37

Characterization of Emergency Department Visits Within First Year Post Liver Transplant in Pediatric Patients

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Background
Liver transplantation has been indicated as a cure for many conditions leading to end-stage liver disease and can lead to a great improvement in quality of life. Emergency department visits represent an indicator of quality of life as well as the rate of complications. While few studies have assessed emergency visits of adult liver recipients, literature is scarce when it comes to assessing emergency visits of pediatric liver recipients. The aim of this study is to characterize and assess emergency visits for pediatric liver recipients and identify the most common complaints.
Methods
This was a retrospective study in which electronic medical records were reviewed for all patients younger than 18 years old who underwent liver transplantation at King Faisal Specialist Hospital and Research Center and presented to the emergency department within the first year after transplantation discharge in the period between January 2013 and January 2022. The following data were collected: demographics (age, sex, relation to donor), comorbidities, transplantation data (indication, date of transplant, complications, type of transplant), and emergency visit data (duration between discharge and emergency department visit, presenting complaint, procedures during visit, and outcome of visit).
Results
A total of 378 patients were included in the study, with a total of 1358 emergency visits. 94.5% of the patients underwent living donor transplants, with 82% of the donors being related to the patients. Emergency visits within the first 30 days post-discharge accounted for 28% of total visits, and within 6 months, they had increased to 87% of total visits. First and second visits accounted for 41% of the total visits. Patients had a mean of 3.7 emergency visits and a mean length of stay of 3.6 ± 6.8 days. 43% of total visits resulted in inpatient admission. 43% of patients had at least one comorbidity, with coronary artery disease, chronic kidney disease, and dyslipidemia being the most common ones. Gastrointestinal (24%), infectious (11%), and respiratory symptoms (9%) were the top three reasons for emergency visits.
Conclusions
The first year presents a critical period for pediatric liver recipients, which requires closer observation. Further studies are needed to assess the emergency visit patterns and their prognostic value, the outcome of inpatient admissions after emergency visits, and the prognostic value of different presentations.
Conflicts of interest
No conflicts declared
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PP38

Liver transplantation for ACLF in actively drinking patients: a single centre experience

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Background
The excessive consumption of alcohol is the second most common precipitating factor of Acute-on-Chronic Liver Failure (ACLF). Liver transplantation (LT) is often considered a treatment option for ACLF patients; however, its role in alcohol-related ACLF is controversial due to concerns about ongoing alcohol use and the potential risk of non-adherence after LT.
Methods
Here we describe our centre's experience with three patients with alcohol-triggered ACLF who underwent LT after meticulous selection.
Results
Upon admission, all patients (two women and one man, with a mean age of 55) had grade 2-ACLF, with a mean CLIF-OF 12 and CLIF-ACLF score 57. Only one patient had significant comorbidities, including chronic kidney disease (CKD 2). In 2 patients, beyond alcohol use, triggering factors were gastrointestinal bleeding and non-MDRO bacterial infection. One patient required intensive care unit (ICU) admission before LT and needed renal replacement therapy. The average duration of alcohol consumption was 12 years, with an average of 10 alcohol units per day. Toxicological evaluation revealed an average of 238 pg/mg of ethylglucuronide in hair upon admission. Two patients had a history of failed alcohol use disorder treatment. No psychiatric disorders were identified, the average SIPAT was 27. All patients had good family support and all of them were available to alcohol-rehabilitation treatment after LT. All the selected patients underwent LT with a grade 2 ACLF, with a mean CLIF-OF 10.3 and CLIF-ACLF score 54 at transplant. Before LT, the mean white blood cell level was 12.13x10^9/L, and the mean arterial lactate level was 2.3 mmol/L. One patient died 17 days after LT due to viral myocarditis. The two surviving patients had a mean length of stay in ICU of 14.5 days and a mean post-LT hospitalization time of 34.5 days. One patient experienced early post-LT complications, including ischaemic stroke. Neither of them was re-hospitalized in the 30 days after discharge. Six months after LT, none returned to drink alcohol.
Conclusions
Despite the small sample, these findings suggest that LT can be an effective treatment for ACLF patients who are actively drinking, if performed with strict criteria. Thorough patient selection with a multidisciplinary approach and solid familial support assessment seem critical in achieving favourable outcomes.
Conflicts of interest
No conflicts declared

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