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ORAL PRESENTATIONS (OP)

OP-01

LIVER TRANSPLANTATION (LT) USING DCD DONORS WITH 20 MINUTES NO TOUCH PERIOD: PRELIMINARY ITALIAN EXPERIENCE AT NIGUARDA CA GRANDA HOSPITAL

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Introduction: Donation after cardiac death (DCD), since long considered in EU and USA to expand the donor pool, is possible also in Italy with the ALBA project since 2009 (1). Due to the long "no touch period" (20 minutes) requested by the Italian law after cardiac arrest to declare death(much longer if compared to 5 – 10 mins of France or Spain), liver transplantation (LT) has never been considered, major concerns being the long warm ischemia time (WIT) and the possible major liver injury. With strict entry criteria for donors (1), the constant use of normothermic regional perfusion (NRP, regional ECMO),an option for hypothermic machine perfusion (hMP) and very selected recipients, a LT program from DCD donors was started at Niguarda Ca Granda H in September 2015 (2). Since then and up to now (August 2016), eight LT procedures were performed at Niguarda Ca Granda H (Milan). Aim of this preliminary report is the description of our results, (FU period 60- 320 dd).

Methods: Between Sept 2015 and July 2016, eight (over eleven possible) controlled (2, cDCD) and uncontrolled (6, uDCD) DCD donors were considered fordonation aiming at LT. Median age was 49 yo(range 31-63), median WIT in uncontrolled donors was 126 minutes (including no touch and low flow periods), median NRP time 240 mins (before in situ cold perfusion of the liver graft). hMPwasused in 5 donors (3 uDCD, 2 cDCD) for a median time

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of 170 minutes. The median cold ischemia time (CIT) in the eight donors used for LT was 340 mins (range 270 – 425 mins). At the end of NRP, median pH was 7.26 (range 7.38 – 7.18), lactates 8 mMol/L (range 6 – 12), AST 390 UI/ L (range 55 – 550). As per protocol, after ad hoc informed consent, eight MELD < 20 (median 10)/CHILD A (median 5) candidates suffering for HCC were considered for LT (males 7/8). Median recipients' age was 55 yo (range 54-59).

Results: The follow up period ranges from 60 to 340 dd: survival rate at POD 60 is 100%: at July 30 2016 all the 8 pts are alive, at home and fit. Incidence of primary graft non function (PGNF) and early allograft dysfunction (EAD)(3) were 0 and 12.5% respectively. Median length of surgery was 402 min (345 – 585 min), while median estimated blood loss was 1500 ml (500 – 5000 ml). Median intraoperative requirement of packed red cells was 2 U (0-8), median intraoperative fluids infusion was 4600 ml (crystalloids, 4000; albumin 600 ml), with a median total diuresis of 2000 ml and a median CVP ranging from 8 to 11 mmHg in the various phases of LT. At the end of the procedure, median pH was 7.35, median lactate 5 Mmol, median Hb 10.5 gr/dL. From 12 to 20 hours after the end of surgery 7/8 pts were extubated (median postop intubation time 15 hours). On POD 2, Lactates were 1.2 Mmol, ALT 768 UI/L, Bilirubin 1.9 mg / dL, PT (INR) and aPTT(R) 1.35 and 1.39 respectively, pCreatinine 1.08 mg/ dL. As at August 20, no major surgical complications and ischemic cholangiopathy have been recorded. One pt had biliary stricture due to technical reasons. Moderate and severe acute kidney injury were absent (median pCreatinine at discharge from H 1.1 mg / dL, range 0.7 – 1.6) Two pts (25%) had major infections episodes (one intraabdominal, one pulmonary) and recovered completely. Median ICU and H LOS were 5 (range 3-7) and 23 (17 – 44) days respectively.

Conclusions: In spite of a long "no touch period" (20 mins), preliminary results of this first Italian LT series performed with DCD donors (2) are at the moment favourable and at least comparable with the most recent EU experiences (4). Key points able to impact on this favourable outcome, might be (but should not be limited to…) (a) the constant use of NRP,able to reduce liver injury, possibly inducing, after circulatory arrest, a sort of ischemic preconditioning before the cold ischemia period (5,6). NRP should allow a much safer prolongation of the WIT; (b) quite a short CIT; (c) an extremely favourabledonor age. The role of hMP, indeed an interesting optin, has yet to be clarified, both in our series and in the literature. In conclusion, DCD donation for LT, with a mandatory and strict selection of both donors and recipients might become , also in Italy, a concrete option to expand the donor pool notwithstanding the long"no touch period". Further studies and much larger experience are of course mandatory to make more solid these preliminary results.

References:

1. Geraci PM, Sepe V. Non-heart-beating organ donation in Italy. Minerva Anestesiol. 2011 Jun;77(6):613-23.
2. De Carlis L, Lauterio A, De Carlis R, Ferla F, Di Sandro S. Donation After Cardiac Death Liver Transplantation After More Than 20 Minutes of Circulatory Arrest and Normothermic Regional Perfusion. Transplantation. 2016 Apr;100(4):e21-2. doi: 10.1097/TP.0000000000001136.
3. Olthoff KM, Kulik L, Samstein B, Kaminski M, Abecassis M, Emond J, et al. Validation of a current definition of early allograft dysfunction in liver transplant recipients and analysis of risk factors. Liver Transpl. 2010 Aug;16(8):943-9. doi: 10.1002/lt.22091.
4. Savier E, Dondero F, Vibert E, Eyraud D, Brisson H, Riou B, et al. First experience of liver transplantation with type 2 donation after cardiac death in France. Liver Transpl. 2015 May;21(5):631-43. doi: 10.1002/lt.24107.
5. Oniscu GC, Randle LV, Muiesan P, Butler AJ, Currie IS, Perera MT, et al. In situ normothermic regional perfusion for controlled donation after circulatory death - the United Kingdom experience. Am J Transplant. 2014 Dec;14(12):2846-54. doi: 10.1111/ajt.12927. Epub 2014 Oct 3.
6. Mathur AK, Heimbach J, Steffick DE, Sonnenday CJ, Goodrich NP, Merion RM. Donation after cardiac death liver transplantation: predictors of outcome. Am J Transplant. 2010 Nov;10(11):2512-9. doi: 10.1111/j.1600-6143.2010.03293.x.

OP-02

Renal perfusion, function and oxygenation in the early postoperative period after liver transplantation

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Introduction: Acute kidney injury (AKI) after liver transplantation is a common complication with an incidence of approximately 50% [1], associated with high morbidity and mortality. Little is known about the early effects of liver transplantation on renal perfusion, filtration and oxygenation. This information is needed in order to increase the possibilities to prevent/treat AKI after liver transplantation.

Objectives: The aim of this study was to gain insights into renal perfusion, filtration and oxygenation in the immediate postoperative period after liver transplantation and to compare these data to those obtained from a group of patients undergoing major surgery with no postoperative renal impairment.

Methods: Informed consent was obtained preoperatively from twelve patients with normal renal function accepted for liver transplantation. Glomerular filtration rate (GFR) was measured pre-operatively by plasma clearance of Cr-EDTA. The patients were studied after liver transplantation in the ICU in the immediate postoperative period, sedated and mechanically ventilated. Systemic haemodynamics and renal variables where obtained during two 30-min periods. Renal blood flow (RBF) and GFR were measured by the renal vein retrograde

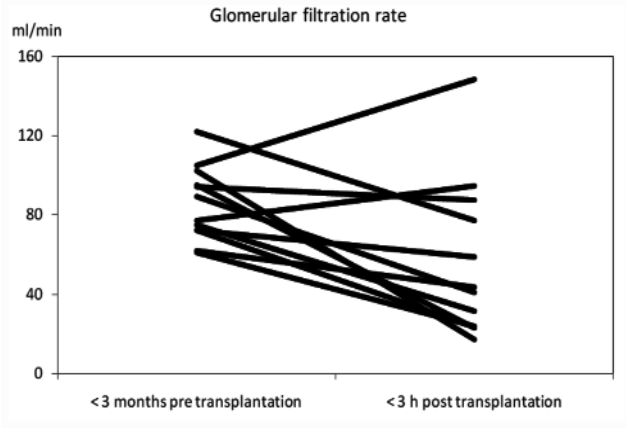

Figure 1 - Glomerular filtration rate before and after liver transplantation

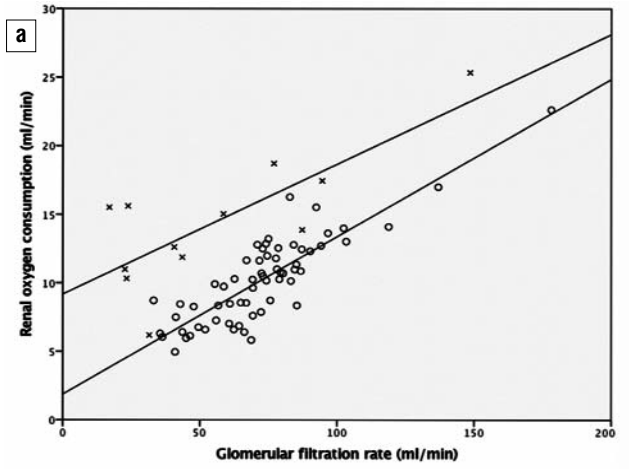

Figure 2a - Shows the individual data on the relationship between renal oxygen consumption and GFR. x = liver transplanted group, o = control group

thermodilution technique and by renal extraction of Cr-EDTA (=filtration fraction, FF), respectively. Arterial (a) and renal vein (rv) blood samples were taken for measurements of arterial (CaO_2) and renal vein ($CrvO_2$) oxygen contents. Renal oxygen consumption [RVO_2 = RBF x (CaO_2-$CrvO_2$)], renal oxygen delivery (RDO_2=RBF x CaO_2) and renal oxygen extraction [RO_2Ex = (CaO_2-$CrvO_2$)/ CaO_2)] were calculated. Sixty-three patients undergoing uneventful cardiac surgery with no postoperative renal impairment served as controls.

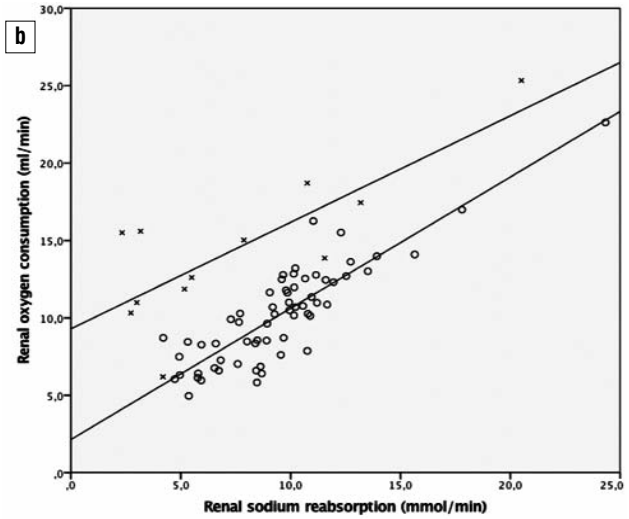

Figure 2b - Shows the individual data on the relationship between renal oxygen consumption and renal sodium reabsorption. x = liver transplanted group, o = control group

Results: Cardiac index (65%) and systemic oxygen delivery index (62%) were higher and systemic vascular resistance index was lower (-38%) in the liver transplant group compared to controls ($p<0.001$). RBF was 17% higher and renal vascular resistance was 16% lower compared to controls ($p<0.05$). In the liver transplanted group, GFR was 35% lower compared to the preoperative value ($p<0.05$, *fig. 1*), accompanied by a 41% increase in serum creatinine ($p<0.05$). After surgery, when compared to controls, GFR and FF was 23% and 40% lower, respectively ($p<0.05$, $p<0.01$), and RVO_2 and RO_2Ex were 42% and 24% higher, respectively, in the liver transplanted patients ($p<0.01$, $p<0.05$). RVO_2 was strongly correlated to both GFR (controls $r^2=0.724$, liver transplants $r^2 = 0.603$), and to sodium resorption (controls $r^2 = 0.739$, liver transplants $r^2 = 0.624$) in both groups. RVO2 per mmol sodium reabsorbed and per ml sodium filtered, where higher in the liver transplanted group than in the control group, as shown by the higher regression slope intercepts in the liver transplanted group than in the control group (*fig. 2a, 2b*).

Conclusions: Despite the hyperdynamic systemic circulation, GFR is considerably reduced immediately after liver transplantation, most likely caused by a post-glomerular renal vasodilation, decreasing upstream glomerular filtration pressure. Renal oxygenation is impaired to a greater extent after liver transplantation compared to after cardiac surgery, due to a higher RVO2, which is not met by a proportional increase in RDO2.

Reference:

1. Hilmi IA, Damian D, Al-Khafaji A, Planinsic R, Boucek C, Sakai T, et al. Acute kidney injury following orthotopic liver transplantation: incidence, risk factors, and effects on patient and graft outcomes. Br J Anaesth. 2015 Jun;114(6):919-26. doi: 10.1093/bja/aeu556. Epub 2015 Feb 10.

OP-03

AN INCIDENTAL FINING DURING PERIOPERATIVE USE OF TRANSOESOPHAGEAL ECOGRAPHY FOR ORTHOTOPIC LIVER TRANSPLANT

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A 62 year old female, blood group O, with alpha-1 antitrypsin deficiency presented to hospital for an orthotopic liver transplant (OLT). She had been pre-assessed 1 year previously by an anaesthetic consultant as part of the routine assessment process that all patients undergo during consideration for transplantation. This pre-assessment identified her as being overweight (BMI 38). Her echocardiogram was unremarkable, with only trivial to mild aortic valve cusp thickening with good excursion. She underwent cardiopulmonary exercise (CPX) testing and achieved an anaerobic threshold of 7.4 mls/kg/min and peak VO_2 of 14.8 mls/kg/min, with a maximum heart rate or 168 bpm and no ST-segment changes. Her ECG showed normal sinus rhythm 74 bpm, normal axis, nil else. Spirometry as within normal limits. She had minimal ascites and peripheral oedema to mid-thigh. Blood tests revealed a platelet count of 64000, INR 1.44 and fibrinogen 0.8. At this time, she was caring for 4 foster children, living in a 2 storey house, and reported as being fully independent with an unlimited exercise tolerance. At the listing meeting, there were no objections from any health professionals, other than advice that she should lose weight. She was subsequently placed on the waiting list for OLT, aware that as a blood group O she might have to wait for an extended period of time for a suitable organ to become available. On the day the patient attended for OLT, the attending anaesthetists were given a copy of the proforma that includes details of her previous anaesthetic assessment. Although the CPX results were particularly poor and her synthetic function markedly deranged, her unremarkable echocardiogram and spirometry, and functional status (reported as unlimited exercise tolerance) were reassuring. When the patient was collected for theatre, it became immediately obvious that her physical condition had changed significantly since her pre-assessment. She had gross pedal oedema up to her waist with chronic skin changes, and there was obvious large volume ascites. The patient was unable to transfer from bed to operating table, and when interrogated reported her mobility was now limited to metres and with the use of a zimmer frame. After an uneventful induction of anaesthesia, a trans-oesophageal probe was inserted to assess her cardiac function. She had a globally grossly enlarged heart, with a markedly enlarged left atrium. Biventricular function was preserved. There appeared to be a at least mild mitral regurgitation, although this is difficult to assess accurately under general anaesthesia. The thickening of the aortic cusps was also seen, with good excursion as previously documented. It had the appearances of a heart that had compensated for chronic volume overload. Her underlying coagulopathy remained severe, and this became evident when inserting central venous and renal replacement catheters. She was given cryoprecipitate prior to knife to skin. Her subsequent course was surprisingly uncomplicated. 9 litres of turbid ascitic fluid was drained. Her only period of hypotension was during reperfusion of the 3 hepatic vein piggy back DBD liver, but quickly corrected with modest doses of vasopressor and calcium chloride. Total blood loss was in the region of 7 litres. Despite a thin initial thromboelastogram (TEG), her TEG at closure was near normal. This case highlighted not the difficulties in managing these patients under anaesthesia, but just how quickly and profoundly this cohort can decompensate. All patients need full anaesthetic assessment at the time of listing, but this case shows how follow-up assessment is essential for patients who wait a long time for a suitable organ, such as those with blood group O like this patient. Fortunately, despite her significant cardiac changes, surgery was uneventful. However, a similar patient might not have such a smooth course, and prior knowledge of any changes to their physiology could help plan what might be a difficult anaesthetic.

OP-04

COAGULATION TESTS IN ACUTE LIVER FAILURE: THE ING AND YANG OF HEMOSTASIS. A CASE PRESENTATION

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Introduction: Acute liver failure (ALF) represents a life-threatening medical condition with limited chance of survival unless liver transplantation (LT) is rapidly performed. Most times, a severe coagulopathy is the hallmark of ALF.
Methods: We present the case of a 9 year old child with no prior medical history admitted to hospital for acute liver failure, massive gastrointestinal bleeding, grade II encephalopathy and jaundice. Our local protocol for ALF diagnosis was applied immediately after ICU admission and the patient was listed for LT.
Results: At the time of admission paraclinical results showed severe cholestasis (bilirubin = 516 umol/L) and coagulopathy (INR=5.25, PT=60.1 sec, Fibrinogen 123 mg/dl) and moderate thrombocytopenia (90000/uL). At the same time ROTEM assay showed near normal values. Transfusion of PRBc was administered for correction of anemia (5.2 g/dL) but no other blood products were administered. An upper endoscopy was performed but no esophageal varices or portal-hypertensive gastropathy were found. A computer tomography of the abdomen and pelvis showed signs of portal hypertension - increased diameter of portal vein and superior mesenteric vein, parietal thickening of the small intestine and colon. On the 5th ICU day Wilson disease was confirmed and emergency living-related LT was performed. Postoperative outcome was excellent and the patient was discharged from hospital 24 days later.
Conclusion: We noted a severe discrepancy between standard coagulation tests and ROTEM findings. The use of ROTEM helped us to lower unnecessary transfusion in a patient that otherwise presented with massive bleeding.

OP-05

PREDICTION OF INTRAOPERATIVE TRANSFUSION REQUIREMENTS DURING ORTHOTOPIC LIVER TRANSPLANTATION: THE VALUE OFROTEM

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Background: Although preoperative hemoglobin and MELD or one of its components may correlate with blood product usage, prediction of intraoperative blood product based on preoperatively available variables is unreliable. We hypothesized that basal (presurgery) data from Rotem may predict blood product requirements.
Method: Data from a randomized, multicenter, hemoglobin-stratified, double-blind placebo-controlled trial of pre-emptive administration of concentrated fibrinogen has been analyzed. The transfusion threshold for platelets and fibrinogen were 50.000 /mm for platelets and 1g/L of fibrinogen. For the aim of the study, data from all patients were taken together. The predicted values from a mixed model for repeated measures including logistic regression and longitudinal values for preoperative data and ROTEM variables.
Results: 92 patients were included; 48% received RBC's, 17.5% platelets, 10.9% FFP, median of 2.74 g of fibrinogen were administered. 24% received tranexamic. RBC administration was related to basal: MELD Odds1.38 [1.19 - 1.60]; Hb 0.33 [0.21 - 0.54]; Fibrinogen 0.35 [0.15 - 0.80]; Platelets 1.00 [1.00 - 1.00]; PTT 3.48 [1.25 - 9.68]; maxim amplitude-MA (0.94 [0.89 - 1.00]; MA 10min 0.79 [0.67 - 0.95]; FibMax10 0.79 [0.66 - 0.93]. Any blood product usage was related to: MELD 1.24 [1.12 - 1.37]; Hb 0.52 [0.40 - 0.69; Fibrinogen 0.27 [0.12 - 0.63] ; Platelets 1.00 [1.00 - 1.00]; MA 0.84 [0.77 -0.92]; MA 10 min 0.67 [0.55 - 0.83]; FibMax10 0.71 [0.59 - 0.86]. In a multivariate analysis, only Maxim Amplitude showed prediction for RBC: Odds (per 1 unit change) prereperfusion 0.92 [0.86 - 0.99], Odds (per 1 unit change) postreperfusion 0.88 [0.81 - 0.96]; ROC AUC :0.733. As well as for any blood product usage: MA Odds (per 1 unit change) prereperfusion 0.85 [0.78 - 0.93], Odds (per 1 unit change) postreperfusion 0.84 [0.76 - 0.92]; ROC AUC :0.788.
Discussion and conclusions: MELD and basal Hb stratified patients at risk of blood product usage,however, basal maxim amplitude is the only predictive data in both prereperfusion and postreperfusion of the graft. Correction of Rotem parameters may reduce blood product usage.

OP-06

ENCEPHALOPATHY-ALWAYS TRIGGERED BY GRAFT DYSFUNCTION?

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Background: The incidence of neurological complications influences significantly the recovery of patients after liver transplantation. Neurological complications include encephalopathy, seizures, cerebral edema, central pontine and extrapontinemyelinolysis or posterior reversible encephalopathy syndrome. The incidence is reported up to 25%.
Case report: We present the case of a 51-year-old female patient. The lady suffered from Budd-chiari syndrome. The diagnose was made more than one year before she presented to our center. As risk factors for thrombosis polycythemia vera and Factor V Leiden were diagnosed. The lady was treated with coumarin together with 5-hydroxy urea and discharged from the hospital. On admission to our hospital she was decompensated with jaundice, ascites and encephalopathy. We made a high-urgency request to Eurotransplant, which was confirmed by the ELAC Audit. Within 72 hours a suitable organ was allocated and the patient was transplanted. Immunosuppression was calcineurin-inhibitor (CNI) (tacrolimus) based together with mycophenolate mofetil and corticosteroids. The trough-level of tacrolimus was 5.8ng/ml during her ICU stay. The liver function tests and synthesis parameter were in normal range within one week. However, she developed dysarthria, dysphagia and inconstant myoclonus. The neurologic work-up which included CCT, C-MRI was clear, but EEG indicated a drug-induced toxic effect. After switch from tacrolimus to cyclosporine A all symptoms resolved within eight days. The patient was referred to a peripheral ward on the twentieth postoperative day (POD) and discharged from the hospital on the thirty-six POD.
Conclusions: Neurological complications after liver transplantation occur frequently, which is often associated with the CNI´s. After exclusion of pathological changes in CCT and C-MRI, the immunosuppression should be modulated.

OP-07

A RARE CASE OF GRAFT FAILURE

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Background: Liver transplantation was approved by the FDA as treatment of choice for end-stage liver disease (ESLD), when cyclosporine A (CSA) was launched in 1983 to avoid acute or chronic rejection. When CSA was used for immunosuppression one-year survival increased from 30% to 70-80% in different centers. Acute graft failure represents a life threatening condition. Most patients can only survive with emergency retransplantation.
Case report: We herein report the case of a 42-year-old recipient suffering from primary biliary cirrhosis (PBC) who lost her graft six days after transplantation due to acute cellular rejection. The initial clinical course was uneventful. The patient could be extubated on the second postoperative day (POD). Immunosuppression was calcineurin-inhibitor (tacrolimus) based together with mycophenolate mofetil and corticosteroids. The trough-level of tacrolimus in the first days varied between 5-8 ng/ml. On the sixth POD the doppler ultrasound indicated a nearly no-flow pattern of the portal vein. The patient was scheduled for an emergency relaparotomy with suspicion on portal vein thrombosis. The Fogarty maneuver did not show a thrombus formation. The reason for this no flow state was a significant edematous swollen and necrotic liver. The liver specimen indicated an acute cellular rejection. The transaminases increased to AST 10200U/L and ALT 3789U/L, the patient developed a dialysis dependent kidney failure, lactate went up from normal values to 10 mmol/l. We discussed this case in our transplant board and came to the conclusion that the liver would not recover. The patient was listed for emergency transplantation at Eurotransplant. After 24 hours a suitable organ was allocated. The patient received a second transplantation. Twelve days after the second transplantation transaminases and bilirubin were increasing again and a liver biopsy showed an acute cellular rejection. Patient received pulse dose cortisone and the tacrolimus trough-level was adjusted to 14 ng/ml. Four days later a second biopsy showed again signs of slight rejection, so the patient received again pulse dose cortisone. Afterwards there were no more signs for rejection. The recovery of the patient was prolonged due to dialyses dependent kidney failure, critical illness neuropathy and right sided pneumonia.
Conclusions: PBC is an immunologic disease,therefore these patients are more prone to cellular rejection compared to virus hepatitis patients. In the recent 20 years there has been tremendous improvement of immunosuppression, which reduced significant the number of severe life threatening rejections. However, when the flow pattern of the doppler ultrasound changes, one should also consider rejection as a possible diagnose, rather than technical failure, particular in patients with PBC.

OP-08

HEMOSTASIS DISORDERS IN A FULMINANT HEPATIC FAILURE PATIENT- A CASE REPORT

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Background: Acute liver failure patients present a unique challenge in hemostasis assessment and management, especially in the case of extracorporeal therapies or liver transplantation.
Material and Methods: This is a case report of a young patient with fulminant hepatic failure due to acute HVB infection, admitted to the ICU with hepatic encephalopathy grade 4, important hepatic cytolysis, cholestasis and prolonged standard coagulation tests (SCTs). Progressive diffuse cerebral edema was diagnosed and managed with mild hypothermia, hypernatremia, hypocapnia and high-volume hemofiltration (CRRT) with UFH anticoagulation.The patient was not bleeding and thromboelastometry parameters were in the normal range. In day 3 he underwent liver transplantation with minimal intraoperative bleeding, without the administration of procoagulant therapies or blood products. Thromboprophylaxis was started on the first postoperative day. Complete neurologic recovery allowed extubation, but the postoperative evolution was complicated by the occurrence of deep venous thrombosis and low resistive index (RI) of the hepatic artery. Treatment included therapeutic anticoagulation, antiplatelet treatment, and prostacyclin. The evolution was favorable with complete remission of DVT and normalization of the RI of the hepatic artery.
Results and Conclusions: This case illustrates the complex hemostasis disorders encountered in the perioperative management of acute liver failure patients. In this patient, the profound alterations of standard coagulation tests were not correlated with the results of viscoelastic tests used, nor with bleeding in the preoperative and intraoperative period. The prothromboticstatus revealed after liver transplant when the patient developed deep venous thrombosis and low resistive index of the hepatic artery. In conclusion, this case illustrates the fragile balance of procoagulant and anticoagulant factors in acute liver failure patients with prolonged SCTs but preserved hemostatic capacity, making management and monitoring of anticoagulant therapy a difficult task.

OP-09

THROMBOCYTOPENIA IN CIRRHOSIS: AND THE CONTRIBUTION OF FIBRINOGEN TO BLEEDING RISK

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Introduction: A platelet count of $<50 \times 10^9$/L is a trigger for platelet transfusion for bleeding prophylaxis in those requiring liver biopsy (1,2). However, this threshold may not be appropriate in cirrhotic liver disease. A "rebalancing" of haemostasis has been described, with thrombocytopenia partially compensated for by increased Von Willebrand Factor and reduced ADAMTS-13. (3) The contribution of Fibrinogen to clot strength in severe thrombocytopenia in haematological conditions has also been previously shown (4). We investigated the relationship between baseline platelet count, clauss fibrinogen, maximum amplitude (MA) on thromboelastography (TEG), and blood loss in our Orthotopic liver transplant (OLT) population.
Methods: We conducted a retrospective analysis of our OLT database (2006-2015). Baseline haematology and intraoperative blood transfusion, as a combination of cell salvage and estimation of 300 mls/unit of allogenic blood, was noted as a surrogate for intraoperative bleeding. 2 groups: Haemorrhage (>1200ml returned) and Non Haemorrhage (<1200 ml returned) were analysed. Statistical analysis was performed using SPSS.
Results: Of 322 OLT patients, 77 were excluded due to fulminant disease; redo transplant or baseline haemoglobin (Hb) of <80g/L. 114 (46.3%) were classified into the haemorrhage group,132 (53.7%) in the Non-Haemorrhage group.

		Haemorrhage	Non	Total	P Value
HB (g/L)			Haemorrhage		
	Mean	101.90	109.71	106.09	0.000
	SD	16.89	15.379	16.53	
Platelets (x10^9/L)					
	Mean	83.18	107.29	96.12	0.005
	SD	55.03	75.14	67.53	
	Median	67	84.5	76.0	
	IQR	42.5	77.5	61.25	
Fibrinogen (g/L)					
	Mean	1.96	2.60	2.3	0.000
	SD	0.91	1.15	1.09	
Hep MA (mm)					
	Mean	42.15	47.71	45.14	0.001
	SD	12.68	11.87	12.54	
Total blood returned (ml)					
	Mean	3323	487	1802	0.000
	SD	2536	419	2251	

Univariate logistic regression with a cut-off of platelets < 50 x 10^9/L as the predictor and Haemorrhage as the outcome showed an Odds Ratio (OR) of 1.393 (95% CI 0.758-2.563; P = 0.286).
ROC curves for platelets, clauss fibrinogen and predicted probabilities from multivariate analysis with Haemorrhage as the outcome are described:

	AUC	95% CI	P value
Platelet Count	0.64	0.534 – 0.674	0.05
Clauss Fibrinogen	0.678	0.612-0.744	0.000
Predicted probability from multivariate analysis: UKELD, HB, Plt, Fib, MA	0.749	0.689-0.812	0.000

Conclusions: A cut off value of 50 x 10^9/L for platelet count is not a good predictor of intraoperative bleeding in the cirrhotic population. ROC curves show a relationship between low baseline platelet count and haemorrhage, however baseline Clauss fibrinogen level is a better predictor (AUC 0.678, 95% CI 0.612-0.744; P=<0.001). Measurement of Clauss Fibrinogen before invasive procedures provides useful information and should be included in routine pre-procedure coagulation testing in cirrhotic patients.

References:

1. British Committee for Standards in Haematology, Blood Transfusion Task Force. Guidelines for the use of platelet transfusions. Br J Haematol. 2003 Jul;122(1):10-23.
2. Patel IJ, Davidson JC, Nikolic B, Salazar GM, Schwartzberg MS, Walker TG, et al. Consensus guidelines for periprocedural management of coagulation status and hemostasis risk in percutaneous image-guided interventions. J Vasc Interv Radiol. 2012 Jun;23(6):727-36. doi: 10.1016/j.jvir.2012.02.012. Epub 2012 Apr 17.
3. Tripodi A, Mannucci PM. The coagulopathy of chronic liver disease. N Engl J Med. 2011 Jul 14;365(2):147-56. doi: 10.1056/NEJMra1011170.
4. Lang T, Johanning K, Metzler H, Piepenbrock S, Solomon C, Rahe-Meyer N, et al. The effects of fibrinogen levels on thromboelastometric variables in the presence of thrombocytopenia. Anesth Analg. 2009 Mar;108(3):751-8. doi: 10.1213/ane.0b013e3181966675.

POSTERS (P)

P-01

CORRELATION OF CLAUSS FIBRINOGEN AND TEG FUNCTIONAL FIBRINOGEN IN ACUTE LIVER FAILURE

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Background: Clauss fibrinogen (CF) is the gold-standard laboratory measure of plasma fibrinogen. Thromboelastograpic functional fibrinogen (FF-TEG) provides values for estimation of fibrinogen level (FLEV) and raw-TEG fibrinogen maximum amplitude (FF-MA). These permit rapid assessment of fibrinogen using near-patient testing. Good correlation between FF-TEG and CF exists for baseline measurements during orthotopic liver transplantation (OLT). However, discrepancies between TEG-FF andCF in the post-reperfusion stages of OLT have been reported1. It is uncertain whether there is a reliable correlation between FF-TEG and CFin patients with acute liver failure (ALF). We aimed to assess whether baseline FLEV or FF-MA correlate with CF during OLT for ALF. We also sought to evaluate the association of CF and FLEV/FF-MA with bleeding risk.

Method: A retrospective database analysis of OLTs for all-cause ALF was conducted. All cases predating introduction of FF-TEG measurement were excluded. A threshold of 1200ml red cell transfusion was used as a marker of significant intraoperative bleeding. Spearman correlation coefficients and statistical data comparisons were calculated using SPSS.

Results: 24 patients were included. A statistically significant correlation was found between FLEV and CF (Spearman's rho 0.455; p=0.025) and FF-MA and CF (rho 0.48; p=0.018). A correlation is shown between FLEV and platelet count (rho: 0.599; p=0.002) and FF-MA and platelet count (rho: 0.595; p=0.002). There was no correlation between CF and platelet count (rho 0.09; p=0.675). An association between FLEV/FF-MA and significant bleeding was also demonstrated (*Table 1*).

Table 1

	Group1 (n = 5) Non-sign bleed <1200	Group 2 (n = 19) Sign bleed >1200 ml	p-value
UKELD			
Mean	57.8	57.2	p = 0.803
SD	2.167	6.67	
Median	59.0	59.0	
Range	5	24	
Platelet count			
Mean	150.6	84.5	p = 0.155
SD	90.85	61.2	
Median	145.0	62	
Range	233	235	
Clauss Fibrinogen			
Mean	2.02	1.62	p = 0.643
SD	1.78	1.47	
Median	1.50	1.3	
Range	4.6	5.2	
FLEV			
Mean	5.24	2.99	p = 0.049
SD	1.83	2.03	
Median	5.10	2.40	
Range	4.9	8.6	
FF-MA			
Mean	28.70	15.83	p = 0.042
SD	10.0	11.41	
Median	28.1	13.30	
Range	26.9	47.70	

Conclusion: FLEV and FF-MA are correlated with Clauss fibrinogen in patients undergoing OLT for ALF. Clauss fibrinogen was not found to be associated with risk of clinically significant bleeding. FLEV and FF-MA, however, were associated with bleeding risk and this may provide useful clinical information. Overall numbers in this analysis were small and further prospective evaluation is required to explore these trends.

Reference:

1. Yang Lu S, Tanaka KA, Abuelkasem E, Planinsic RM, Sakai T. Clinical applicability of rapid thrombelastography and functional fibrinogen thrombelastography to adult liver transplantation. Liver Transpl. 2014 Sep;20(9):1097-105. doi: 10.1002/lt.23923. Epub 2014 Aug 8.

P-02

COLONISATION/INFECTION IN PATIENTS AFTER LIVER TRANSPLANTATION-1 YEAR SURVEILLANCE AT A GERMAN UNIVERSITY HOSPITAL

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Introduction: Post transplantation infections are a significant threat to patients and graft survival and affect morbidity and mortality. Despite recent improvements in surgical technique, antimicrobial and antifungal prophylaxis and immunosuppression, the number of infectious is still high, although regional and centre to centre differences are reported. Moreover, the number of patients colonized with multidrug-resistant (MDR) bacteria on the waiting lists for OLT increases. Thus data from different countries and centres may help to improve prevention and treatment strategies in theses patients.
Methods: From January 2013 to December 2013 we prospectively enrolled 58 patients undergoing liver transplantation in our centre. Data on immunosuppressive and antimicrobial medication, clinical outcome and microbiological surveillance were collected. Microbiological isolates were classified as colonization or infection according to the criteria of the Centre of Disease Control and Prevention.
Results: Standard immunosuppression consisting of Prednisolon, Tacrolimus and Basiliximab was given in 42 patients, the remaining 16 patients received individual combinations including CyclosporinA, Everolimus or Mycofenolat. Based on individual risk assessment antimicrobial prophylaxis was given in 32 patients. In the 30 day period post transplantation 44 patients (75%) developed an infection. Urinary tract infections (n = 23), pneumonia (n = 11), surgical site infections (n = 18) were the most frequently diagnosed. Microbiological surveillance revealed 87 isolates, 53 gram positive bacteria including 51 Enterococci, 22 gram negative bacteria and 15 yeasts. Fourteen patients were colonized with MDR bacteria, 5 of them pre transplantation, the remaining 11 patients acquired the MDR pathogen post transplantation. In 6 cases the MDR pathogen was associated with infections. In 18 cases intraoperative sampling from the biliary tract revealed 15 gram positive (predominantly Enterococci) and 9 gram negative isolates. No association between intraoperative isolates and future infections could be seen. Six patients died, 4 due to septic complications and 2 due to graft failure.
Conclusion: In our cohort the number of positive microbiological specimens was high and infections occurred frequently. Enterococci and gram negative bacteria were the most relevant pathogens. The rate of patients colonized with MDR bacteria pre transplantation was low, but 24% of patients acquired an MDR-pathogen throughout the 30 day period post transplantation. Nevertheless no impact on mortality or infection rates was correlated with this. Results from intraoperative microbiological sampling could not predict the kind of pathogen or infectious complication. For post transplantation prophylaxis Enterococci should be included. The small number of patients and the single centre setting may limit generalization of these results.

P-03

AGREEMENT BETWEEN FIBTEM AND FIBRINOGEN PLASMA VALUES IN LIVER TRANSPLANTATION

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Background: FIBTEM have been used as transfusion criteria of fibrinogen in liver transplant (LT). Despite that overall correlation between FIBTEM and fibrinogen has proven to be acceptable, the agreement(i.e. linear relationship between two variables under the constraint where the intercept is zero and the slope is one) between both parameters have not been investigated until now. We aim to assess the agreement between FIBTEM and fibrinogen plasma values across LT procedure.
Methods: Data from a randomized, multicenter, hemoglobin-stratified, double-blind placebo-controlled trial of pre-emptive administration of concentrated fibrinogen has been analyzed. The transfusion threshold for platelets and fibrinogen were 50.000 /mm and 1g/L, respec-

tively; which were monitored to ensure consistency and compliance across all the research centers. Fibrinogen plasma was determined by Clauss method. For the aim of the study, data from all patients were taken together. The predicted values from a mixed model for repeated measures including longitudinal values for ROTEM variables were compared to the actual fibrinogen values using the Lin's concordance coefficient.

Results: 92 patients were included; 51 to the fibrinogen group and 48 to the saline group. Patient's characteristics no differ between groups. In the fibrinogen group a median of 400 ml preemptive fibrinogen (3.54 g) were administered. In the saline group a median of 300 ml of preemptive saline were administered.Maximum amplitude at 10 minutes (A10MA-FIBTEM) was t he FIBTEM parameter that best predicted fibrinogen values, in both preemptive group and control? Pearson correlation coefficient was R=0.5 (0.8 and 0.3 pre / post reperfusion, respectively), all p<0.001. Lin´s concordance correlation coefficient was showed in *table 1*. Overall, A10MA-FIBTEM correlated with fibrinogen plasma levels; however, the agreement between both parameters was unacceptably low, especially in patients with advanced stage of liver disease after graft reperfusion.

Table 1 - Lin´s concordance correlation coefficient between fibrinogen predicted values from MMRM analysis of A10MA-FIBTEM and actual plasma fibrinogen values

	Lin's concordance coefficient (95% CI)
All values	0.333 [0.287 to 0.377]
Pre-Reperfusion	0.756 [0.710 to 0.796]
Post-Reperfusion	0.144 [0.083 to 0.204]
Baseline Meld ≤ 16	0.517 [0.451 to 0.579]
Baseline Meld > 16	0.082 [0.033 to 0.131]

A10MA-FIBTEM: maximum amplitude at 10 minutes. Median MELD=16

Discussion & Conclusions: Qualitative alterations in fibrinogen synthesis (disfibrinogenemia) and hemodilution respectively, could partially explain these results. Studies should be conducted in other to find which one is the best predictor of blood product transfusion in this context.

P-04

THE USE OF TRANEXAMIC ACID IN THE PERIOPERATIVE MANAGEMENT OF PATIENTS UNDERGOINGORTHOTOPIC LIVER TRANSPLANTATION

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Introduction/Background: Orthotopic liver transplantation (OLT) is a common surgical procedure indicated in patients with liver failure. It involves a myriad of complications such as haemorrhage, transplant rejection, and adverse effects from immunosuppressants. Haemorrhages in particular increase pre- and post-transplantation mortality rates, and arise from haemostatic disturbance. Activation of the fibrinolytic cascade significantly contributes to haemorrhaging, thus antifibrinolytics such as aprotinin and tranexamic acid (TA) are administered to reduce blood loss and the need for transfusion. While aprotinin used to be the standard antifibrinolytic administered in OLT, its use has been associated with an increased mortality risk and has thus been removed from the pharmaceutical market. This review explores whether TA can be justified as a substitute in routine OLT.

Materials and methods: Four databases – Medline, Embase, Scopus and Web of Science – were used to find relevant studies. The inclusion criteria ensured that studies were full clinical trials comparing TA with placebo/other antifibrinolytics.

Results: Seven studies met the inclusion criteria. Results were qualitatively categorised into the effects of TA on blood loss, transfusion requirements, coagulation, and adverse effects such as mortality.

Discussion: TA significantly reduces blood loss and transfusion requirements and is better at coagulation compared to placebo. While its ability to reduce blood loss and transfusion requirements pales in comparison to aprotinin, it is better at achieving coagulation than aprotinin. None of the studies were sufficiently powered to measure safety and mortality.

Conclusion: TA is a viable alternative in OLT that would be more beneficial than forgoing the administration of an antifibrinolytic.

P-05

PREDICTION OF FLUID RESPONSIVENESS BY RESPIRATORY VARIATION IN INFERIOR VENA CAVA DIAMETER (ΔICV) IN LIVER TRANSPLANT PATIENTS

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Introduction: Dynamic parameters such as the respiratory variation in inferior vena cava (IVC) diameter are accurate indices of fluid responsiveness in septic shock patients.In patients undergoing liver transplantation, anatomical changes related to the vena cava may exist. Indeed, LT can be performed using the standard caval replacement or side to side cavo-caval techniques.The aim of this study is to assess validity of respiratory variation of ICV to predict fluid responsiveness in liver transplant recipient.
Patients and methods: Forty patients undergoing liver transplantation from November 2014 to November 2015 at Henri Mondor Hospital were included in this prospective study. Data were recovered from medical charts. Cardiac index (CI), inferior vena cava distensibility index [ΔIVC= (Dmax – Dmin) / Dmin x100] were measured before and after a passive leg raising test (PLR) using transthoracic echocardiography. Patients were considered to be responders and non-responders when CI increased to either ≥ 10% or < 10% after PLR.
Results: Twenty-seven recipients (67.2%) were male and the median age at liver transplantation was 58 [25-70] years. The causes of liver transplantation were end stage liver disease (n=17, 42%) and hepatocellular carcinoma (n=12, 30%). The mean MELD score was 19.42 ± 10.42. Thirty patients (75%) were considered to be responders. There were no statistically significant differences between fluid responders and non-responders in relation to clinical parameters such as age, sex and MELD score. Before the PLR test, the responders displayed a Dmin IVC lower than the non-responders(18.6 ± 2.1 mmvs. 23.3 ± 2.1 mm, p=0.01). In addition, ΔIVCwas higher in responders (15 ± 11 % vs.3±7% p=0.009). The best cut-off value for ΔVCI as defined by the ROC curve analysis was 12.5% to predict fluid responsiveness in liver transplant recipients, for which sensibility and specificity were 56% and 90%.
Conclusion: Despite the complexity of IVC anatomical changes after liver transplantation, the respiratory variation of IVC seems valuable in predicting fluid responsiveness in liver transplants recipients.

P-06

QUALITY OF LIFE AND ANAEMIA IN PATIENTS UNDERGOING ASSESSMENT FOR LIVER TRANSPLANTATION

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Background: Liver transplantation is not only aimed to improve survival from liver disease, but also to improve quality of life (QoL) of recipients.(1) QoLcan be affected by many factors, including liver disease, malnutrition and anaemia. We implemented a quality improvement project to assess the QoL of patients undergoing assessment for addition to the transplant waiting list as a baseline measure for their long term QoL follow up.
Methods: All patients presenting for clinical assessment for eligibility for addition to the liver transplant waiting list at the Royal Free Hospital, London between October 2013 and March 2015 were given the EQ-5D-5L and Multidimensional Fatigue Inventory (MFI) QoL questionnaires to complete as part of their routine admission paperwork and collected prior to discharge.
Results: 89 patients (mean age 54 (SD 10.5)) returned completed questionnaires. Median MELD was 13 (IQR 10-18). Mean Hb was 111.2 g/L (SD 19.1) and 63% of patients were anaemic (Hb<120 g/L). MELD and Hb were inversely correlated (R2=0.1 p=0.003). In the UK population 68.2% have an EQ-5D Visual Analogue Scale (VAS)>80 (out of 100). (2) Only 34% of patients had a score >80 (mean 65.5 (SD 21.5)). EQ-VAS scores were not significantly related to MELD, however, this measure was significantly correlated to Hb (p=0.031). Measures of general and physical fatigue on the MFI were significantly related to MELD score, but not Hb. A regression model adjusting for age, MELD and Hbdid not show a significant correlation to the QoL measures.
Conclusion: These patients had a reduced QoL compared to the general population. The reasons for this are multifactorial, yet there was a variable relationship between the severity of liver disease and QoL. Significant numbers of patients are anaemic and this was related to QoL in one of instruments used. Interestingly fatigue scores were more strongly related to MELD than to Hb. QoL data as well as other physiological data should be routinely collected prior to transplantation as an additional outcome variable.
References:

1. Yang, L. et al, Liver transplantation: a systematic review of long-term quality of life, Liver Int. 2014: 34: 1298–1313
2. Devlin, N.et al. Valuing Health-Related Quality of Life: An EQ-5D-5L Value Set for England, https://www.ohe.org/publications/valuing-health-related-quality-life-eq-5d-5l-value-set-england

P-07

AUDIT: A DECREASING FREQUENCY IN THE USE OF INTRACRANIAL BOLTS FOR THE MANAGEMENT OF ACUTE LIVER FAILURE

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Background: The onset of hepatic encephalopathy in patients with Acute Liver Failure (ALF) is associated with an increased risk of cerebral oedema and brain herniation. A failing liver leads to the accumulation of cerebral ammonia which is converted into osmotically active glutamine that drives cerebral oedema and a rise in intracranial pressure (ICP)(1). A high ICP (>25 mmHg) is an ominous sign and is linked to a higher mortality and neurological damage in ALF survivors with or without liver transplantation. Placement of an intracranial bolt is the most sensitive and specific method available to detect a high ICP. A bolt also enables the derivation of cerebral perfusion pressure, guides evaluation of ICP lowering therapies and aids anaesthetic practice during transplantation. Critics of ICP bolt monitoring in ALF highlight the risks associated with the procedure, in particular intracerebral haemorrhage, and the failure to show a mortality benefit from invasive monitoring (2). We sought to better understand our own practice by establishing the proportion of our ALF patients that received a bolt and whether this had changed in recent years.
Methods: Single centre, retrospective audit of all patients with ALF from 1993 to 2016.
Results: 1278 ALF patients were identified, mean 55 per year (SD 9.5). In total 321 received an ICP bolt, mean = 25% per year (SD 9). For the last 4 years there has been a downward trend in the proportion of ALF patients receiving ICP bolts, 16, 8,10 and 13%.
Conclusion: The downward trend in bolt insertion observed is likely due to a greater emphasis placed on the risks of the procedure within our unit. In line with the most recent evidence only the most severe acetaminophen ALF patients receive bolts (3).
References:

1. Singanayagam A, Bernal W. Update on acute liver failure. CurrOpinCrit Care. 2015;21(2):134-141.
2. Karvellas CJ, Fix OK, Battenhouse H, et al. Outcomes and complications of intracranial pressure monitoring in acute liver failure: A retrospective cohort study. Crit Care Med. 2014;42(5):1157-1167.
3. Fortea JI, Banares R, Vaquero J. Intracranial pressure in acute liver failure: To bolt or not to bolt-that is the question. Crit Care Med. 2014;42(5):1304-1305.

P-08

INTRAOPERATIVE OXYGEN ADMINISTRATION IN PATIENTS UNDERGOING LIVER TRANSPLANTATION AT THE ROYAL FREE HOSPITAL, LONDON

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Introduction: Supplemental oxygen is the most commonly administered drug during general anaesthesia. Hyperoxaemia (PaO_2>13.3 kPa) is associated with adverse changes to the respiratory and cardiovascular systems (1,2). This has particular relevance during liver transplantation where ischaemia-reperfusion injury (IRI) post Pringle manoeuvre is potentiated by oxygen-induced production of reactive oxygen species and immune cell activation (3). Supra-physiological partial pressures of oxygen may hence worsen postoperative outcome. This audit of practice assessed intraoperative oxygenation during liver transplantation.
Methods: This retrospective audit looked at intraoperative data for sequential liver transplants performed over a period of 15 months (October 2014 to January 2016) at the Royal Free Hospital. Data were retrieved from anaesthetic charts, arterial blood gases (ABGs) and laboratory reports. We calculated the area under the curve (AUC) of PaO_2 to determine cumulative intraoperative PaO_2 per hour. We calculated the percentage of operative time during which each patient had a measured partial pressure of oxygen within 4 specified ranges (determined by taking the median and IQR of all PaO_2 results, *fig. 1*).

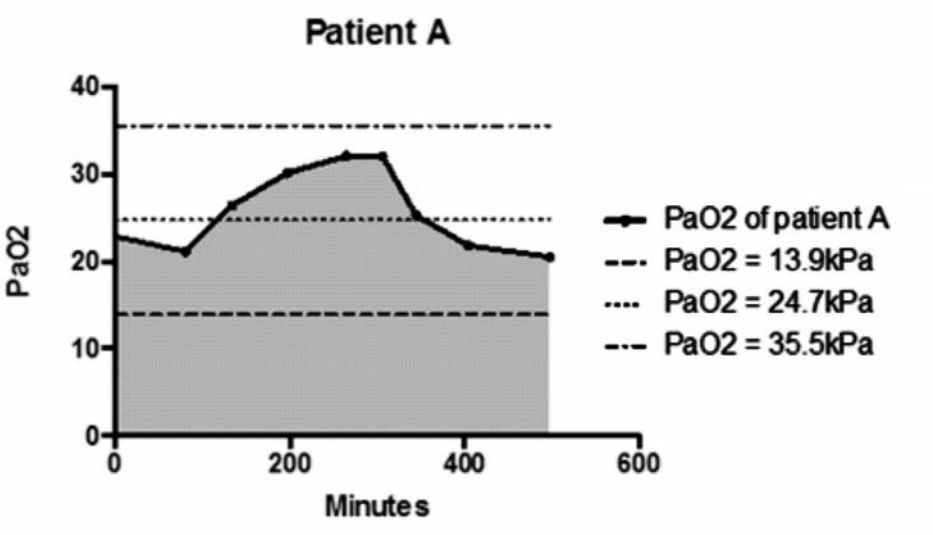

Figure 1 - Example of the intra-operative oxygenation profile of an individual patient. AUC represents the cumulative oxygen dose. Horizontal lines allow the visualization of proportion of time patients are oxygenated within predefined ranges (<13.9kPa, 13.9-24.7kPa, 24.8-35.5kPa, >35.6kPa)

Results: 118 patients were included; 69.5% were male (n= 82). The median age of all patients was 50.5 years. The median number of intraoperative ABGs per patient was 9 (range 5 to 23). AUC analysis for each patient revealed that overall, patients spent 4.9% of the operation with a measured PaO_2 of <13.9 kPa. For 45.5% of the overall operative time patients had a PaO_2 of 13.9–24.7kPa and 43% of the time the PaO_2 was 24.8 – 35.5 kPa. The PaO_2 was > 35.5kPa for 6.7% of the operation.

Table 1 - Oxygenation and haemoglobin values according to operative stage for all patients

Operative stage (number of samples)	Median FiO_2 (IQR)	Median PaO_2 in kPa (IQR)	Median P:F ratio in kPa (IQR)	Median Haemoglobin g/l (IQR)
Stage 1: dissection (330)	0.48 (0.08)	24.70 (11.2)	54.05 (21.7)	94 (25)
Stage 2: anhepatic (186)	0.49 (0.09)	25.85 (8.8)	55.51 (19.4)	89 (20)
Stage 3: reperfusion (349)	0.46 (0.10)	23.50 (9.8)	53.60 (22.2)	83 (17)

Conclusion: We have demonstrated the presence of intraoperative hyperoxaemia throughout liver transplantation surgery. There appears to be no adjustment of FiO_2 in response to hyperoxaemia, despite the lack of evidence that hyperoxaemia is beneficial during major surgery. Further research is required to explore this observation in other transplant centres.

References:

1. Milone SD, Newton GE, Parker JD. Hemodynamic and biochemical effects of 100% oxygen breathing in humans. Can J PhysiolPharmacol. 1999;77:124-130.
2. Farquhar H, Weatherall M, Wijesinghe M et al. Systematic review of studies of the effect of hyperoxia on coronary blood flow. Am Heart J. 2009;158:371-377.
3. Zangl Q, Martignoni A et al. Postoperative hyperoxia (60%) worsens hepatic injury in mice. Anaesthesiology. 2014; 121:1217-25

P-09

COMBINED LIVER TRANSPLANTATION AND GASTRIC SLEEVE RESECTION. A CASE REPORT

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Background: Obesity is common even in liver transplantation (LT) yet optimal mana-gement remains unclear. Hepatobiliary inter-

ventions in morbidly obese patients are associated with increased risk of bleeding, postoperative complications and mortality and morbid obesity is a relative contraindica-tion to liver transplantation (3–6). Long term impact of obesity on post-LT outcomes including recurrence of NASH and hepatitis C virus (HCV) is becoming evident (1-3). Obesity is associated with many causes of morbidity and mortality post-LT (4). A non invasive approach to weight reduction may not be successful especially for those with long-standing obesity. Bariatric surgery may be suitable for patients with early-stage li-ver disease (5), but may be contraindicated (6). Post transplant bariatric surgery may be an option (7)

Material and Methods: We present the case of a 45 years old woman, BMI 38, scheduled for li-ver transplant for Hepatitis C undergoing combined liver transplant and Sleeve gastrectomy. We performed the liver transplant first, cognisant of the risk of massive bleeding and hemodynamic instability. She received 2 gr of fibrinogen, 2 units of RBC, 6 unit of FFP and 5lt of crystalloid during the procedure. The post-operative period was uneventful and pa-tient was discharged home 6 days after the combined procedure.

Results: Hepatobiliary complex interventions are with many postoperative com-plications and mortality. Morbid obesity is a relative contraindication to liver transplantation for the same reason. Our patient is currently alive after 8 month from combined procedure with significant weight loss (BMI = 28 Kg/m^2).

Conlusion: Combined liver transplant plus gastric sleeve resection can be performed safely. Careful follow up to avoid malnutrition and excessive weight loss is necessary.

References:

1. Contos MJ, Cales W, Sterling RK, et al. Development of nonalcoholic fatty liverdisease after orthotopic liver transplantation for cryptogenic cirrhosis. Liver Transpl 2001; 7: 363–373.
2. Dureja P, Mellingerr J, Agni R, et al. NAFLD recurrence in liver transplant recipients. Transplantation 2011; 91: 684–668.
3. Gane EJ. Diabetes Mellitus following liver transplantation in patients with hepatitis C virus: Risks and consequences. Am J Transplant 2012; 12: 531–538.
4. Watt K, Pedersen RA, Kremers WK, Heimbach JK, Charlton MR. Evolution of causes and risk factors for mortality post liver transplant: Results of the NIDDK long term follow-up study. Am J Transplant 2010; 10: 1–8.
5. Weingarten TN, Swain JM, Kendrick ML, et al. Nonalcoholic steatohepatitis (NASH) does not increase complications after laparoscopic bariatric surgery. Obes Surg 2011; 21: 1714– 1720.
6. Mosko JD, Nguyen GC. Increased perioperative mortality following bariatric surgery among patients with cirrhosis. Clin Gastroenterol Hepatol 2011;9: 897–901.
7. D'Hondt M, Vanneste A, Pottel, et al. Laparoscopic sleeve gas- trectomy as a sin-gle-stage procedure for the treatment of morbid obesity and the resulting quality of life, resolution of comorbidi- ties, food tolerance, and 6-year weight loss. SurgEn-dosc 2011; 25: 2498–2504.

P-10

TRANSIENT PACE INSERTION DUE TO ELECTROCARDIOGRAPHIC DISTURBANCE DURING LIVER TRANSPLANTATION

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Introduction: We report the second case in our hospital presenting ECG rhythm disturbances during hepatic graft reperfusion.

Case report: A 17 year-old male was hospitalized with jaundice and abdominal swelling. His CHILD and MELD scores were 8 and 25. His past history consisted of a living-related liver transplantation due to infantile cholestasis syndrome at 9 years-old and echocardiography showed hepatopulmonary shunting. With the diagnosis of secondary biliary cirrhosis, the patient underwent a second living-related liver transplantation. Although total of 26 units of erythrocyte suspension (ES), 20 units of fresh frozen plasma (FFP), 5 units of solution apheresis platelets (SAP), crystalloids, colloids and inotropes such as dopamine (5-15 µg/kg/min), norepinephrine (0.05-0.3 µg/kg/min) and epinephrine (0.05-0.2 µg/kg/min) were infused to the patient until the 11th hour of the surgery (2 hours after reperfusion), his heart rate was still less than 45 beats/min. He was consulted with cardiology department and temporary pacemaker inserted into the right ventricle outflow tract. The patient received 45 units of ES, 45 units of FFP and 9 units of SAP during the surgery. He was transferred to the intensive care unit (ICU) with an arterial blood gas values of pH: 7.48, $PaCO_2$: 36 mm-Hg, PaO_2: 202.7 mm-Hg, Hemoglobin: 7.9 g/dL, hemotocrit: 22.4%, Lactate: 11.2 mmol/L, Na^+: 146 mmol/L, K^{+2}: 3.2 mmol/L, Cl^{-1}: 100 mmol/L, Ionized Ca^{+2}: 1.15 mmol/L, and under inotropic agents, after a 28-hour surgery. No anesthesia- or surgery-related complication was occured. On the postoperative 5th day he was extubated, and 7th day his pacemaker was removed. After his 14 days of uneventful ICU follow-up, he was sent to the gastroenterology service and discharged before long. His 2 years follow-up has been trouble-free with normal hepatic function test values.

Conclusion: In the litherature there are rare case reports reporting that inserting pace makers in the early period ensure succesfull clinical results.

P-11

IMPACT OF INR ON TEG VELOCITY CURVES

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Introduction: In liver cirrhosis, a rebalancing of haemostasis has been described (1), with a reduction in both procoagulant and anti-coagulant factors. Standard tests of coagulation e.g. INR correlate poorly with bleeding (2). We investigated the relationship between INR and Thromboelastography (TEG), in particular Velocity Curves, in our Orthotopic liver transplantation (OLT) population.
Methods: We performed a retrospective analysis of baseline TEG and INR data in 114 consecutive OLT patients from 2013-2015. We excluded those patients with fulminant hepatic failure or redo transplantation, and those with baseline haemoglobin of 80g/L. Statistical analysis was performed using a statistics package (SPSS).
Results: From a total of 63 data sets, 4 sets (6%) of data were incomplete. *Table 1* shows descriptive statistics for Velocity curve and heparinase TEG parameters for INR values of <2, 2 to 2.5 and >2.5. MRTG: Maximum rate of thrombus generation (mm/min), TMRTG: time to maximum rate of thrombus generation (S), TG: Thrombus generated (mm/min).

		INR <2.0	INR 2.0-2.5	INR >2.5	P value
n		50	4	5	
Peak Height					
	Mean	4.62	2.00	1.75	0.10
	SD	2.76	2.0	1.71	
	Median	4.00	4	1.50	
MRTG	Range	12.00		4.00	
	Mean	3.29	1.82	1.26	0.23
	SD	1.87	1.94	0.96	
	Median	2.79	3.29	1.61	
TG	Range	9.57		2.12	
	Mean	447.51	388.7	316.15	0.93
	SD	437.04	268.9	258.89	
	Median	577.65	392.3	368.93	
Hep R	Range	1800.69	681.1	608.39	
	Mean	21.91	55.0	63.85	0.01
	SD	12.59	74.4	82.78	
	Median	19.45	21.8	23.40	
Hep K	Range	73.40	169.1	167.40	
	Mean	10.34	10.72	13.40	0.99
	SD	8.15	9.80	0.79	
	Median	8.10	8.30	13.10	
HepAng	Range	52.4		1.50	
	Mean	26.71	21.30	17.03	0.60
	SD	10.91	21.90	0.91	
	Median	25.70	13.90	16.90	
	Range	52.90		1.80	
Hep MA					
	Mean		40.70		
	SD	47.11	12.10	34.63	0.50
	Median	47.10	23.80	33.80	
	Range	98.90		18.70	

Conclusion: Trends of a decrease in peak height, MRTG and TG were apparent with increases in INR, although not statistically significant on ANOVA. R time (P= 0.01) and K time increased with a progressive increase in INR. Lower INR cut-off values (1.5) have previously been used to assess viscoelastic tests, but our results suggest that clot kinetics assessed at higher INR values may provide useful information. Further prospective investigation is required.

References:

1. A Tripodi PM. The coagulopathy of Chronic Liver disease. N Engl J Med. 2011;365:147-56.
2. Massicotte L DA, Thibeault L, Hevesi Z, Nozza A, Roy A. Relationship between conventional coagulation tests and bleeding for 600 consecutive liver transplantations. Transplantation. 2014;98(2):e12-3.

P-12

EFFECTS OF PLATELET COUNT ON ROTATIONAL THROMBOELASTOMETRY IN PATIENTS WITH END-STAGE LIVER DISEASE

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Introduction: The rebalanced approach in patients with End-Stage Liver Disease (ESLD) has lead to the search of new hemostatic tests in such patients. Of these, ROTEM assay is used world-wide in guiding blood transfusion in the perioperative setting or in the ICU. The aim of our study was to assess the impact of platelet count on ROTEM parameters in patients with ESLD.
Methods: We included 162 consecutive patients with ESLD admitted to the ICU before liver transplantation. Exclusion criteria consisted of: presence of hepatocellular carcinoma, pro-hemostatic or anti-thrombotic therapy within the last 7 days, extrahepatic hemostatic disorders. Recorded data included: demographic variables, standard coagulation tests, ROTEM parameters (standard parameters and derived parameters: thrombin potential index – TPI, maximum velocity of clot formation – MaxV, time to MaxV – MaxVt, area under the curve – AUC and maximum clot elasticity – MCE), liver functional tests and severity scores.
Results: The mean age in our study group was 54±12.6 years and the mean MELD and MELD scores were 18.75±7.32 and 19.46±7.39, respectively. The median platelet count was 73378 [12000-247000]. We found a direct linear correlation between platelet count and ExTEM TPI (p=0.000, R2=0.466) and a non-linear, quadratic correlation between platelet count and ExTEM MCF (p=0.008, R2=0.451) and ExTEM MCE (p=0.000, R2=0.362). A cut-off of 70000 platelets was determined below which both clot elasticity and firmness fall below the lower-normal limit.
Conclusion: Platelet count has a significant impact on hemostasis in patients with ESLD and this can be determined using derived ROTEM parameters. Although we could determine a cut-off for platelet count below which coagulation becomes impaired, further data are required in order to determine the lower safety value below which this becomes clinically significant.

P-13

PRELIMINARY RESULTS OF A PREHABILITATION PROGRAM IN LIVER TRANSPLANT CANDIDATES

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Background: Postoperative complications have a strong negative impact on clinical outcomes of the liver transplantation (LT). There is evidence indicating that aerobic capacity is associated with better postoperative prognosis. Prehabilitation, defined asthe process of enhancing the functional capacity, appears as highly promising preventive intervention in candidates for LT who characteristically exhibit poor cardiorespiratory reserve and exercise capacity.
Objective: to evaluate the feasibility and safety of a personalized physical trening program to improve aerobic capacity in LT candidates.
Methods: Prospective pilot quasi-experimental study. Candidates for LT were invitedto participate in a 6 to 8-week outpatient fitness program (personalized and elapsed inthe community setting). Main outcome measures: training-induced enhancement ofaerobic capacity (endurance time [ET]) and health-related quality of life (time frame: before and after the exercise training program). Data were compared to those from contemporaneous matched LT candidates that follow standard care.
Results: Up to now, 22 patients (58±6 yr-old): 12 (preHAB-group) and 10 (control group) were included. No baseline differences in sex, age, MELD score, aerobic capacity (endurance time [ET]: 262±61 and 287±108 sec, respectively, p=0.70), physical activity (YALE index 45±8 and 43±4, respectively p=0.88), nor quality of live (CLDQ 4±0.7 and 5±1, respectively, p=0.59) were found between groups. All patients in preHAB group followed the training program. PreHAB-group showed an increase in physical activity index (from 45±8 to 79±15, p=0.02) and CLDQ (from 4±0.8 to 5±0.5, p=0.04) and a trend to increase in aerobic capacity (ET from 262±61 to 764±383 sec, p=0.09) after the program. Control group remained unchanged after the same period.
Conclusions: A personalized physical training program is feasible and may help toimprove the level of physical activity, quality of life and probably aerobic capacity in LTcandidates. Its impact on postoperative outcome needs to be evaluated in a randomized trial.

P-14

IMPACT ON FIBRINOGEN RICH PRODUCTS CONSUMPTION OF TWO DIFFERENT STRATEGIES FOR ANTIFIBRINOLYTIC ADMINISTRATION DURING LIVER TRANSPLANTATION

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Background: ROTEM® helps to significantly reduce the administration of blood products during liver transplantation (LT). Additionally, ROTEM® gives the opportunity to monitor the appearance of fibrinolysis and to avoid the prophylactic use of antifibrinolytics. We aimed to compare the impact of two different strategies for antifibrinolytic administration during liver transplantation surgery, universal prophylactic administration or administration guided by ROTEM® criteria.

M&M: All LT performed during 2010 and 2015 were reviewed. Demographic, transfusion requirements and outcome data (early graft function, postoperative re-intervention for bleeding, thrombotic events within 6 months after LT, and long hospital stay) were recorded. Until 2010, antifibinolytics were administered profilactically after anesthesia induction in all patients without contraindication; thenceforth, antifibrinolytics were administered if fibrinolysis was detected on ROTEM®' analysis. The rest of the transfusion policy was similarly according to our ROTEM® evaluation algorithm, (*fig. 1*).

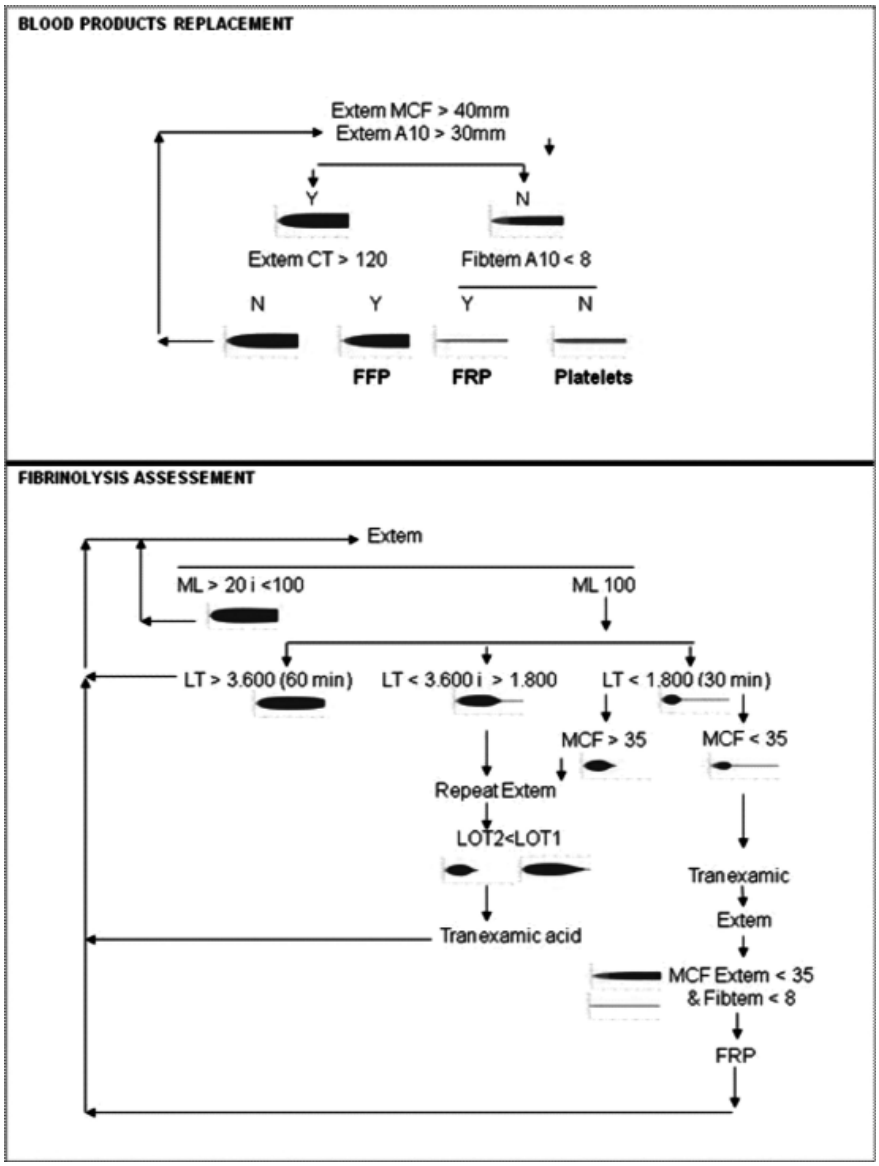

Figure 1 - ROTEM algorithm for haemostatic management during liver transplantation used in Hospital Clinic of Barcelona

Results: 72 LT were performed during 2010, and 67 LT were performed during 2015 in our institution. Data from the overall population was: Age 56 (50-63) years, Sex 96 male/43 female, BMI 25 (22-29), MELD 16 (9-22), etiology of liver disease: 28% HCV, 26% HCC, 16% OH ,30% others, with no significant differences between both years. Antifibrinolytic (tranexamic acid) was administered to 59% of LT recipient in 2010, and in 29% of LT recipients in 2015 ($p<0.01$). Blood product requirements in 2010 and 2015 are showed in *table 1*. The estimated increase in the global cost of the fibrinogen rich products was 20.268 euros. There were no differences in the outcome parameters.

Table 1 - Blood product requirements in 2010 and 2015

	2010 (n=72)	2015 (n=67)	p
RCB, n	2 (0-4)	2 (0-3)	0,91
FFP, units	4 (0-6)	0 (0-0)	0,00
PLAT, yes / no (%)	31 / 69	15 / 85	0,023
FRP, yes / no	41 / 58	55 / 44	0,076
FC, yes / no	17 / 83	47 / 52	0,000
Cryoprecipitates, yes / no	26 / 74	16 / 83	0,111

Discussion & Conclusions: The administration of antifibrinolytics by ROTEM® criteria lead to a significant reduction in the anti-fibrinolytic administration compared to the prophylactic policy. This change was accompanied by a significant increase in the fibrinogen rich products consumption and administration, without variations in red blood cells requirements, neither in the overall outcome. Given the cost-efficacy implications, prophylactic vs therapeutic use of tranexamic acid deserves to be reviewed in this context.

P-15

COAGULOPATHY ASSESSMENT IN CIRRHOTIC PATIENTS WITH PORTAL VEIN THROMBOSIS OR REDUCED PORTAL FLOW VELOCITY. A CASE CONTROL PILOT STUDY

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Background: Portal vein thrombosis (PVT) in cirrhotic patients is usually associated with worsening outcomes. Local and/or systemic pro-thrombotic factors may play a role in the development of PVT, but risk factors associated with PVT in cirrhosis are still under debate.The aim of this study was to assess coagulation disturbances in critically ill cirrhotic patients with recent PVT or reduced portal flow velocity and to compare the results tostable cirrhotic patients with preserved portal blood flow.
Material and Methods: Cirrhotic patients with PVT or portal flow velocity less than 15 cm/s admitted in the ICU were included in the study group (SG). Cirrhotic patients with preserved portal flow velocity were included in the control group (CG). Exclusion criteria: chronic kidney or hematologic diseases, bleeding, pregnancy, anticoagulant/antiplatelet therapy, blood derivates or procoagulantsin the last 7 days. The following tests were performed: SCTs,individual coagulation factors plasmatic levels(PLs) and rotation thromboelastometry (ROTEM) with standard parameters and new parameters providing indirect measures of thrombin generation (Sorensen et al, 2003) calculated from the first derivative of the clot firmness curve: Maximum Velocity (MaxVel), Time to MaxVel (t-MaxVel), Area under the curve (AUC). MCE (Maximum clot elasticity) was used to calculate δMCE, a parameter reflecting the platelet component of clot strength (Solomon et al, 2015).
Results and Conclusions: 32 patients were included in the SG and 52 patients in the CG. SG patients had prolonged SCTs, but no significant differences were noted in standard ROTEM parameters or PLs. SG patients had higher t-MaxVel and AUC ($p=0.017$, $p=0.016$), MCE and δMCE($p=0.024$, $p=0.014$) compared to CG, showing a delayed coagulation initiation, followed by increased thrombus formation with higher platelet contribution to clot strength as compared to CG patients.These abnormalities were only detected by dynamic hemostasis measurements but not with SCTs. For firm conclusions, the completion of this pilot study is required.

P-16

CLINICAL AUDIT PROMPTS A SOLUTION TO HANDOVER DIFFICULTIES IN ORTHOTOPIC LIVER TRANSPLANTATION (OLT)

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Background: The decline in kidney function is common following orthotopic liver transplantation (OLT). Many perioperative factors influence its incidence and severity. The extent of this influence in our transplant population and whether any improvement can be made in their perioperative care are unknown.
Material and Methods: Audit of perioperative events in all the OLT recipients operated on in 2015 at the SVUH (1) National Liver Transplant Centre. After accounting for preoperative variation, we assessed whether intraoperative concerns (e.g. haemodynamic factors, surgical technique, graft quality) correlate with kidney function in the immediate post operative period.
Results: Sixty-two patient files were reviewed. Due to the sample size and missing data points, no definitive conclusions could be made regarding specific areas for service improvement. However, we discovered that salient intraoperative information was mostly hand written, in different locations within the patient file, making it difficult to form a snapshot of the intraoperative course. This posed a risk of important intraoperative information being over looked in the immediate postoperative period (2) and complicated the work of our ICU and Hepatology colleagues. Therefore we developed a single page (A4) handover template, using widely available Microsoft Office. The information can be entered via an Excel spreadsheet (presenting an opportunity for a prospective database to be maintained), automatically transferred into a Word document using Mail Merge function and then printed as the a tre-to-ICU handover.
Conclusion: During our audit, we identified elements of suboptimal handover process, prompting development of an efficient solution both for handover documentation and an intraoperative event database. This solution would appeal to OLT services lacking Information Technology support and/or funding to facilitate succinct handover documentation.
References:

1. St Vincent's University Hospital, Elm Park, Dublin, Republic of Ireland
2. Johnson JK, Arora VM. Improving clinical handovers: creating local solutions for a global problem. Quality and Safety in Health Care. 2009 Aug 1;18(4):244-5.

P-17

HIGH MELD SCORE AND EXTENDED OPERATING TIME PREDICT PROLONGED INITIAL ICU STAY AFTER LIVER TRANSPLANTATION AND INFLUENCE THE OUTCOME

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Background: Expectations for an immediate intensive care unit (ICU) stay after liver transplantation (LT) have changed remarkably over the last decade. The present study aimed to determine the incidence of prolonged initial ICU stay after LT (>3 consecutive days) and to identify recipient, donor, and surgical factors associated with it. Its influence on survival has also been investigated.
Material and Methods: We retrospectively analyzed data of adult recipients who underwent deceased donor LT at the University Hospital Essen (11/2003 -07/2012). Exclusion criteria were death within 3 days after LT, retransplantation, multiple organ transplant and diagnosis of early allograft dysfunction after LT.
Results: Of the 374 recipients finally included in our cohort, 225 (60.16%) had a prolonged ICU stay. On univariate analysis, last donor INR, high vasopressor doses, "rescue offer" grafts, being hospitalized at transplant, high urgency cases, labMELD at transplant, alcoholic cirrhosis, pre-LT renal replacement therapy and length of surgery were associated with prolonged ICU-stay. After multivariate analysis, only labMELD and length of surgery were independently correlated with an ICU-stay longer than 3 conscecutive days. Cut-off values for MELD and duration of LT were 19 and 293.5 min, respectively. A score was constructed indicating the probability of a recipient to stay in the ICU longer than 3 conscecutive days: 1/[1 + EXP (- (- 2.869 + 0.15 x LabMELD + 0.004 x Duration of operation (min)))](c-index = 0.72555). Moreover, prolonged intial ICU stay was also associated with longer total length of hospital stay (27.78±10.30 vs. 35.23±22.48, $p<0.001$) and impaired patient survival rates (81.7% vs. 98% at 3 months, 75.7% vs. 91.6% at 1 year and 61.6% vs. 80.3% at 5 year, $p<0.001$).
Conclusions: For recipients with optimal graft function, prediction of a prolonged initial ICU stay is feasible based on labMELD and duration of operation.

P-18

PREOPERATIVE CORONARY ARTERY CALCIUM SCORE AS A SCREENING TOOL FOR CORONARY ARTERY DISEASE AND PREDICTING CARDIAC EVENTS IN LIVER TRANSPLANT RECIPIENTS

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Objective: The purpose of this study was to ascertain the role of coronary artery calcium score (CACS) as a modality of screening the asymptomatic patients for coronary artery disease (CAD) inpatients undergoing liver transplantation.
Background: Marked haemodynamic changes are noticed in the perioperative period in the recipients of the liver transplantation and this affects the outcome in patients with coronary artery disease. End stage liver disease is accompanied with low systemic vascular resistance thereby masking the effect of stress on the heart. Cardiovascular mortality of upto 50% and morbidity up to 80% has been reported in patients with coronary artery disease post liver transplant surgery. It is therefore important to identify these patients before transplant so that necessary intervention and management can be undertaken
Material and Methods: Asymptomatic adult patients undergoing liver transplantation were screened with coronary artery calcium score preoperatively as a modality of detecting coronary artery disease over three year period from 2013 to 2015. They were further investigated for coronary artery disease if they had other risk factors like dyslipidemia, diabetes mellitus, NASH, smoking or age more than 50 years. CT angiography or conventional angiography was performed as per protocol. The necessary interventions like PTCA or CABG was undertaken with cardiology consultation.
Results: 45 % of the asymptomatic patients undergoing liver transplantation had a CACS greater than zero, whereas 17% of patients had CACS score > 100. Patients with CACS > 100 had significantly higher incidence of critical CAD ($p=<0.05$). Similarly adverse cardiovascular events were more ($p=<0.05$) in those with CACS > 100.
Conclusions: CACS score of < 100 has a good negative predictive value for presence of CAD and predicts a low cardiac complication rate as well.

P-19

ACUTE FULMINANT HEPATIC FAILURE IN PREGNANCY; AN UNCOMMON PRESENTATION REQUIRING TRANSPLANT

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Background: Acute fatty liver of pregnancy (AFLP) is uncommon, occurring in around 1:20,000 deliveries. Caused by a deficiency of fatty acid metabolism, it may be in a spectrum of disorders including intra-hepatic cholestasis of pregnancy and HELLP 1. Rarely, acute fulminant hepatic failure occurs.

Patient details: A 22year old, 37/40 pregnant with twins presented to a district general hospital with abdominal pain, jaundice and encephalopathy. She was coagulopathic with a PT>320 and an APTT>240. Intra-uterine deaths were identified and a diagnosis of AFLP was made. After transfer to St James University Hospital, coagulopathy was managed with vitamin K, Octaplas, platelets and fibrinogen. A caesarean section (CS) was performed 6 hours after arrival. After multi-disciplinary team and family discussion, super-urgent listing for transplant was made with a UKELD score of 66. Transplantation occurred 24 hours after CS; native thrombo-elastography is shown in *fig. 1*.

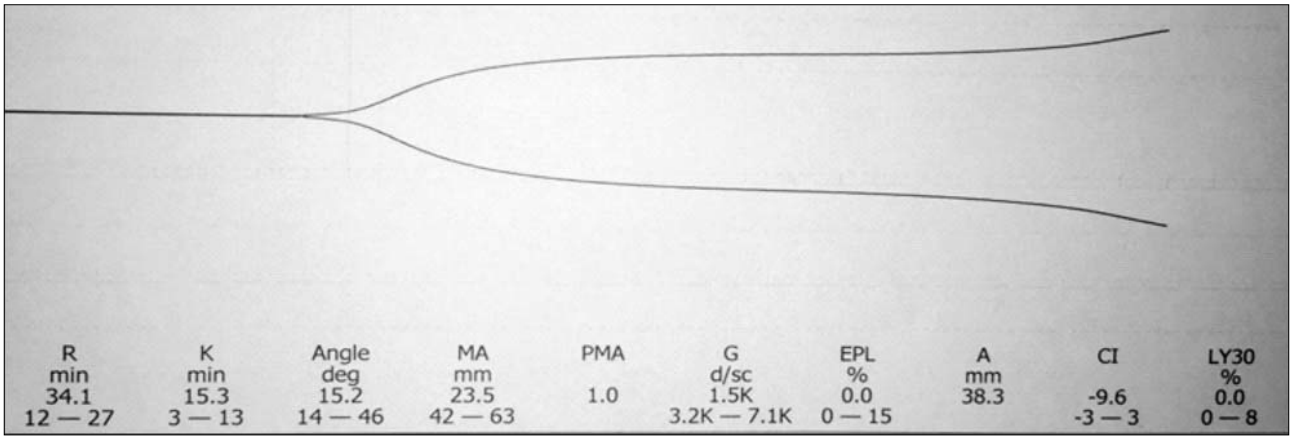

Figure 1

Discussion: The decision to list for transplant was difficult as hepatic function may resolve after delivery of the placenta 2 and transplantation for this aetiology is rare. The team at King's Hospital, London were consulted for advice. Multi-disciplinary approach is essential and team working in this case was highly effective; the patient made a good recovery. The severity of hepatic failure was greater than expected following AFLP and the liver appeared steatotic and ischaemic at transplant. An additional pathology contributing to the marked hepatocellular necrosis seen in the explant histopathology was sought but not found.

References:

1. Rajasri AG, Srestha R, Mitchell J. Acute fatty liver of pregnancy (AFLP) - an overview. J ObstetGynaecol. 2007; 27(3):237-40.
2. Lee WM. Etiologies of liver disease. Semin Liver Dis. 2008; 28(2):142-152