Liver

A population-based study was performed via linkage to the national Hospital Episode Statistics registry, which records every adult (>18 y of age) hospital attendance, admission or clinic event within England since 2006. Across the entire registry we captured all incident cases of UC alone (group 1); and UC with an established diagnosis of PSC, or UC diagnosed with PSC subsequently (group 2). Case finding/definition was as per Jess et al (Gastro 2012), by applying ICD10 codes for UC overall (inclusion K51), UC/PSC more specifically (inclusion K51 +K83.0) and excluding other causes of liver injury (K70–77, K80.3/4, B16–19). Cases were captured till 03/2015; follow-up ending 1y thereafter. Event rates (colectomy, colorectal cancer [CRC], liver transplantation [LT], death, and all-cause mortality) were stratified according to age strata at UC diagnosis.

Results

Over 10 years, 1,286,946 incident UC cases were identified (annualised incidence/100,000 population: 23.8 in 2006; rising to 25.1 in 2015). Of this group, 2,124 were diagnosed with PSC at some point (incidence in 2006 and 2015: 0.29 and 0.4, respectively). Observing the UC cohort in entirety, we observed 210 1st LT (206 in group 2), 9,413 individuals who came to colectomy, 1,208 CRC cases, and 11,177 pt. deaths. The leading cause of mortality was coronary disease (1%) in group 1; whereas liver-related death (5.9%), cholangiocarcinoma (4.6%) and CRC (1%) predominated in group 2. The incidence rate ([IR]/1000-py.yrs.) was greater in the UC/PSC group for colectomy (17.3 vs 13.7), CRC (5.6 vs 1.3), LT/death (38.5 vs 15.1), and all cause mortality (26.4 vs 15.1); p<0.001 for all. Time-dependent Cox regression validated the negative impact of PSC onset for each endpoint (time-dependent adjusted hazard ratio: 1.62, 3.31, 2.47 and 1.62, respectively; p<0.001 for all). Compared to UC alone, the standardised incidence ratio (SIR) for CRC was greatest in UC/PSC of young presenting age (<40 y); a 7-fold increase (figure 1A). This contrasted to pts. diagnosed above age 40 (SIR ~4). Although absolute mortality rate was elevated in older ages (figure 1B) it was in young pts. with UC/PSC that the contrast vs UC alone was most evident for 5 year. (1.6% vs 0.4%) and 10 year. survival (3.6% vs 0.6%); a 4 and 6-fold increase, respectively. Indeed, standardised mortality (SMR) was the greatest for patients diagnosed age ≥40 years., and plateaued with older age at diagnosis (figure 1C).

Abstract OWE-012 Figure 1 a) standardised incidence rate of all clinical events b) absolute mortality rates c) standardised mortality rate over time per age group
Conclusion In pts. diagnosed aged ≤40 years. with UC, development of PSC is associated with 6-fold increase in mortality and 7-fold increased risk of CRC. Within IBD cohorts, those diagnosed at a young age with PSC have a heightened and disproportionately unmet need for life-prolonging therapies.

OWE-013 DEVELOPING AN AUTOMATED INTELLIGENT LFT (iLFT) DIAGNOSTIC ALGORITHM – IMPROVED OUTPUT FOR LESS TRIBULATION

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Introduction Liver Function Tests (LFTs) are commonly abnormal, however; the diagnostic approach to individuals with deranged LFTs is variable, with lengthy processes and an increasing number of referrals to tertiary services and sub-optimal investigation of many patients. The aim of the project was to improve diagnostic proficiency, improving quality of investigation, reducing overall costs to practitioners and patients and reducing secondary care referrals.

Methods The project developed a functional automated ‘intelligent LFT’ (iLFT) system. This algorithm uses the combination of diagnostic criteria for liver disease, an investigation ordering and reporting system, and the tracked blood sciences system. iLFT produces a diagnosis or description of the abnormality with staging information and suggestions for further management. In general allowing allocation to 3 broad outcomes series of outcomes; a) diagnosis requiring complex treatment or advanced liver disease, b) a diagnosis of early or simple liver disease, c) where a clear diagnosis is not made; the GP receives staging and prognostic information including referral information.

A step wedge design trial was conducted in 6 GP practices (covering 30 000 patients). Patients with LFTs measured in the previous 6 months with abnormalities were retrospectively used as controls. During the intervention period (6 months); GPs requested the iLFT option and those patients with abnormal LFTs were assessed.

Results Of 719 patients recruited, (Controls=490; intervention group=229) the iLFT system increased the diagnosis liver disease from first test abnormal LFT cohorts from 16% to 56%. The adjusted (for the step wedge design) difference in rate of liver disease diagnosis was a highly significant increase of 43% (95% CI 27%, 59%)

Health economic analysis showed an incremental care-effective ratio (ICER) of £284 and over a patient lifetime increased quality adjusted life years and saving the NHS (or equivalent healthcare providers) an average £3216 per patient – an unequivocally dominant strategy.

Conclusions iLFT increases liver disease diagnosis, improving quality of care and is unequivocally cost effective. These outcomes can be achieved with minor changes to working practices and existing lab infrastructure and ultimately aim to Result in appropriation of individuals being managed in the most apposite clinical infrastructure.

OWE-014 WHOLE TRANSCRIPTOME SHOTGUN SEQUENCING REVEALS SIGNIFICANT UPREGULATION OF COLONIC MUCOSAL IMMUNE-MEDIATED ANTI-MICROBIAL MECHANISMS IN PSC-UC

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Introduction Primary sclerosing cholangitis is a hepatobiliary disorder of unknown aetiology that is commonly associated with ulcerative colitis (PSC-UC). We have previously demonstrated that patients with PSC-UC have significant alterations in their gut microbiota compared to patients with UC alone and healthy controls. The mechanisms by which these alterations influence pathogenesis is unclear.

Methods Shotgun sequencing was performed on whole transcriptomic libraries of colon biopsies obtained from 10 patients with PSC-UC and 10 healthy controls. Differential gene expression analysis with false discovery rate correction was performed with limma and edger. In addition lamina propria mononuclear cells were analysed by multicolour flow cytometry.

Results The colonic transcriptome of patients with PSC-UC demonstrated 6774 significantly differentially expressed genes compared to healthy controls. Gene expression in PSC-UC clustered separate to healthy controls on multidimensional scaling (p=0.006). Gene enrichment analysis revealed 280 significantly altered biological processes. PSC-UC was characterised by an overexpression of processes associated with regulation of anti-microbial immune responses compared to healthy controls (p<0.0001). These immunological responses were enriched with pathways associated with innate, cell-mediated and humoral immunity, autophagy, complement activation and chemokine signalling (p<0.0001). Expression of genes associated with microbial handling including defenses, mannose receptors and anti-microbial peptides were significantly upregulated in PSC-UC. Paired CD4 T cell immunophenotyping of colon biopsies revealed a significant increase in the population of Th17 cells and IL-17 producing cells in PSC-UC in comparison to healthy controls (18.6% vs 8.5%; p=0.0007 8.5% vs 5.6%; p=0.005 respectively).

Conclusion We have for the first time demonstrated the colonic mucosal transcriptional response in PSC-UC. In comparison to healthy controls, patients with PSC-UC have highly significant expression of genes associated with over-representation of multiple immunological processes, many of which are directed against bacteria. Consistently patients with PSC-UC have a significant increase in colonic mucosal Th17 and IL-17 cell population compared to healthy controls.

OWE-015 PROSTAGLANDIN E2 MEDIATES INNATE IMMUNE SUPPRESSION IN ACUTE-ON-CHRONIC LIVER FAILURE VIA THE EP4 RECEPTOR


Introduction In patients with acute-on-chronic liver failure, innate immune responses are upregulated, possibly leading to liver injury. Prostaglandin E2 (PGE2) mediates an innate immune response that is susceptible to regulation via the EP4 receptor. Therefore, we hypothesised that PGE2 mediates innate immune suppression in acute-on-chronic liver failure via the EP4 receptor.

Results Whole blood mononuclear cells were isolated from patients with acute-on-chronic liver failure and healthy controls. The colonic transcriptome of patients with PSC-UC demonstrated 6774 significantly differentially expressed genes compared to healthy controls. Gene expression in PSC-UC clustered separate to healthy controls on multidimensional scaling (p=0.006). Gene enrichment analysis revealed 280 significantly altered biological processes. PSC-UC was characterised by an overexpression of processes associated with regulation of anti-microbial immune responses compared to healthy controls (p<0.0001). These immunological responses were enriched with pathways associated with innate, cell-mediated and humoral immunity, autophagy, complement activation and chemokine signalling (p<0.0001). Expression of genes associated with microbial handling including defenses, mannose receptors and anti-microbial peptides were significantly upregulated in PSC-UC. Paired CD4 T cell immunophenotyping of colon biopsies revealed a significant increase in the population of Th17 cells and IL-17 producing cells in PSC-UC in comparison to healthy controls (18.6% vs 8.5%; p=0.0007 8.5% vs 5.6%; p=0.005 respectively).

Conclusion We have for the first time demonstrated the colonic mucosal transcriptional response in PSC-UC. In comparison to healthy controls, patients with PSC-UC have highly significant expression of genes associated with over-representation of multiple immunological processes, many of which are directed against bacteria. Consistently patients with PSC-UC have a significant increase in colonic mucosal Th17 and IL-17 cell population compared to healthy controls.

Abstracts
Introduction Bacterial infection is a major cause of hospital admission in liver cirrhosis and patients are highly prone to nosocomial infection. Innate immune dysfunction is strongly implicated in these patients.

We showed prostaglandin E2 (PGE₂) was markedly increased in those patients that demonstrated an immune-suppressive phenotype (1). However, using NSAIDs to reduce PGE₂ production is contraindicated due to renal side effects. We aimed to investigate PGE₂ downstream signalling pathways to identify a potential druggable target to reverse immune dysfunction in acute-on-chronic liver failure (ACLF).

Methods Peripheral whole blood of healthy volunteers (HV) and ACLF patients was studied. Plasma was analysed for cytokine and PGE₂ levels.

Blood was stimulated ex vivo with combinations of lipopolysaccharide (LPS, 1 ng/ml), PGE₂ (1 ng/ml) and EP2/EP4 receptor blockers for 4 hours. Supernatants were analysed for cytokines. qPCR using Taqman primers was used to assay PGE₂ production, enzymes and cell receptors (EP1–4).

Results ACLF patients (mean MELD score 19) were assessed. PGE₂ levels in plasma were significantly increased between HV (163.9 pg/ml) and ACLF (563.8 pg/ml). ACLF patients showed a marked increase in inflammatory cytokines, including IL-1β, IL-6, IL-10 and TNF. Ex vivo stimulation of whole blood with LPS produced significantly lower levels of TNF in ACLF blood (2.178 ng/ml) vs HV (6.649 ng/ml). This was matched by IL-6 production (12.256 ng/ml vs 4.492 ng/ml) which was further reduced by addition of exogenous PGE₂. Blockade of the EP4 receptor completely reversed reduction in both TNF and IL-6, while EP2 blockade had no effect. qPCR of the EP receptors and PGE₂ synthetic enzymes from monocytes and neutrophils from ACLF patients, showed changes in receptor profile and enzymatic machinery used to produce PGE₂. These changes were confirmed by Western Blot.

Conclusions ACLF patients are at great risk of morbidity and mortality due to infection caused by multi-factorial immune dysfunction. We have demonstrated that they have a pro-inflammatory cytokine profile, but an immune-fatigued response to inflammatory stimulus, which mirrors the phenotype seen in the clinic. PGE₂ is significantly raised in these patients, however NSAID use is not possible due to risk of renal side effects. We demonstrated that PGE₂ causes immune dysfunction exclusively via activation of the EP4 receptor and blockade of this receptor restored immune function. EP4 blockade has been shown to have a safe renal profile and we suggest this is a valid target for future immune therapy in ACLF.

Introduction Surveillance for hepatocellular carcinoma (HCC) is recommended by national and international guidelines. However, there are limited data on the impact of surveillance on clinical outcome. Our aim was to compare the stage of disease at diagnosis, treatment employed and survival, among those patients complying with, not complying with, or never entered into, a surveillance programme over a 7 year period at our regional centre.

Methods We analysed data from our prospectively collected regional HCC MDT database on patients diagnosed with HCC from January 2009 to December 2015. Demographics, Child Pugh score and Barcelona-Clinic Liver Cancer (BCLC) stage at diagnosis were collated, as were the treatment strategy employed and survival. We compared the stage of disease, treatment undertaken and survival across 3 pre-identified groups:

1. Compliant with surveillance (enrolled in surveillance and last ultrasound (US)<9 months of diagnosis of HCC); 2. Poorly-compliant with surveillance (enrolled in surveillance but last US>9 months); 3. Never enrolled into a surveillance programme. Kaplan-Meier, log rank analysis and chi-squared tests were used as appropriate.

Results 641 patients were diagnosed with HCC over this period. Follow up data was available for 638 (99.5%) patients with mean follow-up 15 months. Mean age at diagnosis was 69 years and 82.3% were male. HCC diagnoses increased from 62 in 2009, to 143 in 2015. 52.8% of patients had alcoholic liver diseases, 16.8% NAFLD and 15.4% hepatitis C. 160 (25.1%) patients were from Group 1, 54 (8.5%) from group 2 and 424 (66.5%) from group 3. There was an increase in the proportion of patients with HCC who were diagnosed in a surveillance programme during the study period (p<0.01). BCLC classification 0/A (very early stage) for the 2 approaches was similar (mean age: 51.6 v 51.4; mix in-patient beds), and 485 to 665 for in-hospital deaths.

Conclusions The annual number of patients diagnosed with HCC at our regional Centre increased by over 100% during the 7 year study period. A minority of patients diagnosed with HCC were enrolled in a surveillance programme, although the proportion increased over time. HCC Patients enrolled in a surveillance programme had lower BCLC stage at diagnosis, were more likely to receive curative treatment and had improved survival.
AMBULATORY LIVER SERVICES AVOID ADMISSIONS AND REDUCE LENGTH OF STAY WITH HIGH PATIENT SATISFACTION


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Introduction Inpatient bed pressures in the NHS mean that ambulatory service development is needed. Day case and short stay units developed for elective surgery in our trust were not suited to the needs of patients with liver disease. Services managed through semi-acute pathways Resulted in unpredictable waiting times, unplanned admissions and poor patient experience. Following a pilot project in 2016–17, we describe the 2nd phase in implementing ambulatory care services utilising a re-commissioned 4 bed ward bay in a large liver centre. Primary aims were admission avoidance (AA) and inpatient bed day savings. Secondary aims were to achieve ≥70% occupancy, deliver excellent patient experience, provide facilities for earlier discharge (ED).

Methods We identified initial criteria for service delivery through a specialist nurse led unit. Patient episodes were coded to identify procedures, infusion treatments and AA/ED attendances. Safety was assessed by procedure complication rates and patient readmission rates. We used Survey Monkey® to assess patient experience. Bed savings were identified from historical length of stay data in 2015–16.

Results Between 1st May–31st Dec 2017 there were 705 attendances. Of these: 371 large volume paracentesis, 49 urgent liver biopsy, 80 infusions, 46 ascites follow-up and 159 AA/ED indications. Based on a 2.5 day admission for paracentesis, 927 inpatient bed days were saved for this indication and at least 420 urgent, semi-acute or unplanned admissions were avoided. Utilisation increased from 68 attendances/month to 115 in Dec 2017. The unit reached 70% occupancy at 3 months. By Dec 2017 occupancy was >90%. There were 3 readmissions and procedure complication. 95% of patients thought that explanations regarding procedure were very clear and 95% that they were well informed throughout the day. 95% would recommend the service to friends and family.

Conclusion A clear benefit to patients and the service was seen during the first 6 months of opening this unit. We continue to identify indications for use. Other benefits include a growing list of clear admission avoidance/early discharge for other indications. Bed day release has helped patient flow for admissions. Costs incurred in developing a specialist nursing team are offset by their other roles and transfer of ward nursing costs. Unpredicted benefits include a contribution to an overall improvement in ward quality metrics, and release of junior doctor time to direct inpatient management.

RIBAVIRIN FOR TREATMENT OF CHRONIC HEPATITIS E IN TRANSPLANT RECIPIENTS – EXPERIENCE FROM OUR CENTRE

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Introduction Hepatitis E infection usually causes self-limiting hepatitis in immunocompetent patients. In patients who have received solid organ or bone marrow transplants and take immunosuppressive drugs, a chronic or persistent hepatitis can develop defined by viremia for greater than 3 months. Spontaneous clearance can occur with reduction of immunosuppressive load. Failing this, there is evidence these patients can be successfully treated with ribavirin. The goal is sustained viral response (SVR) with undetectable Hepatitis E RNA in blood and stool for 6 months after treatment. A recent analysis of 69 patients with solid organ transplants reported SVR of 78%. Some success has also been seen in bone marrow transplants. We aim to present our experience of treating persistent Hepatitis E infection with ribavirin.

Methods Retrospective analysis of clinical records and the pathology database.

Results Following a screening program at the Queen Elizabeth Hospital, Birmingham we have treated 11 transplant recipients with ribavirin over the last 18 months. Transplant types included 4 liver, 3 kidney, 1 heart and kidney combined and 3 bone marrow. The median age of the cohort was 44, patients were a median of 2 years out from transplant and taking a median of 2 immunosuppressants. ALT was raised in all patients, median value 155 (46 to 599). Ribavirin treatment was given for 12 weeks and continued if stool remained RNA positive at week 12; the median course was 14 weeks. Ribavirin was generally well tolerated although one patient had a treatment break at 2 weeks due to diarrhoea and vomiting; 2 needed EPO support. SVR was observed in 10/11 patients (91%) of whom 9/10 (90%) have continued to show SVR until the present time (mean 2.2 months). ALT responded in all patients, median value 20 (11 to 31). One patient did not achieve SVR and relapsed at 3 months; one patient who did achieve SVR relapsed at 10 months. 2 bone marrow recipients had received high dose steroids for graft versus host disease (GvHD) and liver biopsy was undertaken to distinguish Hepatitis E from GvHD: in both cases the biopsy showed a non-specific chronic hepatitis in keeping with Hepatitis E.

Conclusions Our Results show SVR of 91% with ribavirin in persistent Hepatitis E infection in a diverse cohort with different types of transplant including bone marrow. The fact that all patients had abnormal ALT means that persistent Hepatitis E must be considered as a cause of raised liver enzymes in transplant recipients. Of particular interest is the need to distinguish GvHD from persistent Hepatitis E in bone marrow recipients as the therapeutic approaches are fundamentally different and increasing doses of steroids, and rituximab in one case, led to worsening viral loads in our cohort. Ongoing follow-up will take place in our cohort and look for late relapse.
intervention. This technique has not previously been studied for longitudinal monitoring of patients with HIV and NCPH.

**Results**

We studied 96 patients with a mean age 51.0±12.1 years, MELD score 15.8±6.8, and follow up 25.4±18.3 months. All TIPSS procedures were successful, and indication was as salvage (42%), pre-emptive (44%), and secondary prevention (14%). Initial management involved band ligation in combination with vasoconstrictors and/or Sengstaken-Blakemore Tube in all cases. Patient mortality at 6 weeks, 6 months, 12 months and 24 months was 19%, 24%, 30% and 34% respectively. MELD score >15 was significantly associated with mortality following multivariate analysis. Six week mortality was significantly higher with salvage TIPSS compared to pre-emptive strategy (33% versus 9%, p<0.05), even after controlling for MELD. There was no difference in mortality between pre-emptive and secondary prevention strategies. The overall re-bleeding rate was 2%.

**Conclusion** The outcomes of patients admitted to ICU following a variceal bleed are good and comparable to published literature. This is probably a reflection of high-standard ICU care. Pre-emptive TIPSS up to five days following the index variceal bleed results in significantly better outcomes than salvage TIPSS, with mortality comparable to TIPSS for secondary prevention. However, the currently hub and spoke model of TIPSS services in the UK is unable to accommodate a pre-emptive strategy in all regions.

**Abstracts**

**PWE-073 SLEEN STIFFNESS VIA ACOUSTIC RADIATION FORCE IMPULSE IN HIV PATIENTS WITH NON CIRRHOTIC PORTAL HYPERTENSION**

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**Introduction** Several HIV centres describe small cohorts of patients with non-cirrhotic portal hypertension (NCPH). Didanosine (ddI) exposure has been associated and the optimal monitoring and management of these patients remains unclear. Non-invasive assessment of the spleen is now being utilised to assess splenic stiffness in cirrhotic portal hypertension and predict outcomes. This technique has not previously been studied in patients with HIV and NCPH.

**Methods** Acoustic Radiation Force Impulse (ARFI) elastography was performed using Philips EPIQ7TM to simultaneously assess liver and spleen stiffness in 3 patient groups. Group 1: HIV and NCPH, defined as the presence of portal hypertension manifestations in the absence of cirrhosis; Group 2: HIV and past ddI exposure (without known NCPH), Group 3: HIV and no history of liver disease. Groups were matched for age, HIV chronicity and all had HIV RNA levels<20 copies/mL. Cumulative ddI exposure in Groups 1 and 2 was 56 and 53 months respectively (p=0.91). Median (IQR) ARFI liver and spleen stiffness in Group 1, 2 and 3 was 5.5 (4.8–9.8), 4.3 (4.0–5.3) and 4.8 (3.8–5.2) kPa (p=0.031) and 46.3 (29.5–143.2), 21.3 (14.6–26.8) and 18.3 (14.6–21.6) kPa (p=0.001) respectively. Liver and spleen stiffness were both significantly higher in NCPH vs ddI-exposed (p=0.019 and p=0.005) and ddI-unexposed controls (p=0.038 and p<0.001). Spleen stiffness was more effective than liver stiffness at predicting NCPH, AUROC 0.812 vs 0.948. Combining the two variables improved the diagnostic performance, AUROC 0.961. The optimal cut-off for predicting NCPH using splenic stiffness was 25.4 kPa, with sensitivity 91%, specificity 93%, PPV 91%, NPV 93%, positive likelihood ratio 12.73, negative likelihood ratio 0.10. Spleen and liver stiffness scores were strongly correlated (p=0.0004 95% CI 18, 59).

**Conclusions** Elevated spleen stiffness is observed in HIV patients with NCPH and can be quantified easily using ARFI with high diagnostic accuracy. Novel strategies such as ARFI for longitudinal monitoring of patients with HIV and NCPH should be considered.

**PWE-074 HOSPITALITY DISCHARGE FOR ALCOHOL RELATED PROBLEMS IN NORTH OF ITALY: A SIXTEEN – YEARS PERIOD**

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**Background and aims** WHO (2014) estimates a remarkable decline in per capita pure alcohol consumption in Italy, dropped from 18.1 to 7.1 lt in the period 1970–2013. Despite this, Italian Report on Alcohol 2016 showed an increase in drinking outside meals and a rise in consumption and binge drinking among young people (18–24, 14–17), particularly in males. The impact of these drinking styles on hospitalisation is still under-researched. This study aims to evaluate the trends of hospital discharge for alcohol-related liver disease in the period 2000–2016 in Veneto Region in North Eastern Italy (4.8 million inhabitants).

**Method** Retrospective cohort analysis based on Veneto Region anonymous computerised database of hospital discharges between 2000 and 2016. All Veneto residents discharge records with principal diagnosis of alcohol-related liver disease (cod. ICD9-CM: 571.0, 571.1, 571.2, 571.3) were included in the study. The principal diagnosis was chosen as it is considered the primary reason for hospital admission. Standardised Hospitalisation Ratio (SHR) per five-year age group (ref.
Introduction Non-Alcoholic Fatty Liver Disease (NAFLD) is the hepatic manifestation of metabolic syndrome and is tightly associated with type 2 diabetes (T2DM). Management centres around weight loss and therapies for diabetes and cardiovascular disease to reduce metabolic risk. A multidisciplinary approach involving hepatologists and diabetologists alongside allied health professionals providing structured lifestyle advice is advocated. Objective evaluations of this approach are limited.

Methods We undertook a retrospective study to determine the impact of a large, tertiary centre, multidisciplinary metabolic hepatology clinic. Detailed health parameters and surrogate markers for liver and cardio-metabolic disease were evaluated and a health economic analysis was performed.

Results 165 patients with NAFLD without hepatic co-morbidity and excluding those undergoing bariatric surgery, and who attended ≥2 times between 2014–17, were followed from referral until latest review. Median follow-up was 13 months (2–34). At baseline, 29% had cirrhosis and 59% had T2DM. At follow-up, median liver stiffness, measured using transient elastography, decreased by 1.3 kPa (14%, p=0.0097) and was associated with significant improvement in alanine aminotransferase (ALT: −11 IU/l, 21%, p=0.0001). Median weight fell by 3.3 kg (3.4%, p=0.0005) as did total cholesterol (0.7 mmol/L; 14%, p=0.0023). Median HbA1c also fell (1.5 mmol/mol, 3.1%, p=0.0045). Reduction was most marked in those with poorly controlled T2DM (HbA1c>58 mmol/mol at baseline: 14 mmol/mol, 18%, p<0.0001). These improvements resulted in a 6.4% reduction in 10 year cardiovascular risk (QRISK3, aged-match, p=0.0085).

Preliminary economic analysis of our approach using the UKPDS Outcomes Model in patients with poorly controlled diabetes indicated improvement in quality adjusted life expectancy alongside a reduction in costs of complications if health improvements were maintained. Importantly, preliminary estimates appeared to be below the cost-per-QALY (quality adjusted life year) threshold of £20 000 for commissioning health interventions, suggesting a cost-effective approach.

Conclusion Our Results demonstrate that the liver and cardio-metabolic health of patients with NAFLD managed through a multidisciplinary approach show significant improvements. Patients with poorly controlled T2DM had the greatest improvement in HbA1c of a magnitude known to reduce complications, which may potentially confer good benefit to patients in slowing NAFLD progression. Furthermore, our economic analysis suggest that this approach may be cost-effective.
laboratory Results, few data exist to determine cirrhosis stage at HCC presentation in population-based studies. We present the Results of a pilot study to determine liver disease severity using routinely collected diagnosis and treatment codes related to cirrhosis in hospital episodes at a regional hepatobiliary cancer centre in the UK.

Methods All patients registered within three local Leeds clinical commission groups (CCGs) with a new diagnosis of HCC over a two year period (January 2013 to December 2014) were identified. Using hospital episode codes related to varices and ascites, and cirrhosis, an algorithm was developed to determine cirrhosis severity as defined by the Baveno stage. Patients were stratified according to decompensation status: compensated cirrhosis by Baveno 1 and 2 and decompensated cirrhosis by Baveno 3 and 4. This staging was validated by comparison with clinical records. Data related to demographics, liver disease aetiology and treatment allocation were collected, along with laboratory data to compare with MELD and Child Pugh (CP) scores. Kaplan-Meier survival analysis was used to compare outcomes by liver disease severity.

Results Among 78 patients with a new diagnosis of HCC (median age 69 years, 61 (78%) male), 54 patients (69%) had evidence of cirrhosis at presentation. The most frequent underlying disease aetiologies were hepatitis C (26%) and alcohol-related liver disease (24%). Patients with compensated cirrhosis had a median survival of 22.9 months and those with decompensated cirrhosis it was 2.6 months (p=0.014). The decompensated group had a median CP score of 9 and MELD of 13, compared with a median CP score of 5 and MELD of 10 in the compensated group. The Baveno algorithm correctly determined the Baveno score in 53/54 (98%) patients with cirrhosis.

Conclusions This pilot study demonstrates the successful use of an algorithm to determine Baveno stage using diagnosis and procedure codes from inpatient hospital episodes. This scoring system correlates with other validated prognostic scores in cirrhosis. In patients with HCC, the severity of the underlying liver disease must be assessed when considering outcomes for these individuals. It is expected that this algorithm will be used by the HCC-UK/National Cancer Registration and Analysis Service partnership in forthcoming population-based studies of HCC outcomes in England.

Introduction Spontaneous bacterial peritonitis (SBP) is the most common serious infection in patients with cirrhosis, occurring in 25% of those who develop ascites. It is associated with significant morbidity and mortality rates of 20%–40%.1 British Society of Gastroenterology (BSG) and National Institute of Clinical Excellence (NICE) guidelines recommend long-term prophylaxis (LTP) with Ciprofloxacin or Norfloxacin in patients with cirrhosis who have low ascitic fluid protein concentration (<15 g/L) with or without prior episode of SBP (primary LTP) or who have had an episode of spontaneous bacterial peritonitis (secondary LTP).1 2

Methods We carried out a retrospective observational study using our electronic system for admissions with a diagnosis of ascites and cirrhosis across the East Kent Hospitals NHS Foundation Trust from April 2014 to April 2017. Ascitic fluid analysis Results were reviewed against discharge summaries to audit whether LTP was started according to national guidelines.

Results 337 cases of ascites with cirrhosis were identified (93 female: 244 male) with a median age of 58 (range 30–92 years). 61 out of 337 cases had a current or previous diagnosis of SBP. 5 out of 61 died during their admission. 10 out of 61 were discharged on secondary LTP and 46 patients were discharged without LTP. 11 out of 337 cases had low ascitic fluid protein concentration (<15 g/L) with or without prior episode of SBP (primary LTP) or who have had an episode of spontaneous bacterial peritonitis (secondary LTP).
fluid protein with no current or previous episodes of SBP. None of these patients were discharged with primary LTP. **Conclusions** East Kent Trusts followed national guidelines in starting secondary LTP for SBP in 18% (10 out of possible 56) of cases and 0% of cases requiring primary LTP from April 2014 to April 2017. This low adherence rate may reflect lack of clinician awareness of guidelines for prescribing LTP for SBP in patients with ascites. There may also be a relation to local microbiology guidelines not following BSG or NICE guidelines on initiation of primary or secondary LTP for SBP. This study serves as a reminder to clinicians to carefully consider LTP in patients with ascites secondary to cirrhosis on each admission. We also recommend that trusts review local microbiology guidelines to ensure it adheres to national guidelines.

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**PWE-079 DIAGNOSTIC UTILITY OF AUTOIMMUNE SEROLOGY PROFILING**

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**Introduction** Immunoserology investigation is of clinical use in the discrimination of liver disease of autoimmune aetiology from alternate causes. We sought to investigate the diagnostic utility of immune serology in patients investigated for liver disease.

**Method** We analysed the immunoprofile of patients investigated for liver disease at a tertiary centre between 2001 and 2017. We compared Results for patients clinically coded with a diagnosis of autoimmune hepatitis (AIH), primary biliary cholangitis (PBC), or primary sclerosing cholangitis (PSC) against those without, amongst patients investigated by our department. We also recommend that trusts review local microbiology guidelines to ensure it adheres to national guidelines.

**PWE-080 CHANGE IN BILIRUBIN WITH OBETICHOLIC ACID IN PRIMARY BILIARY CHOLANGITIS PATIENTS WITH HIGH BASELINE BILIRUBIN**

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**Abstracts**

**PWE-080 CHANGE IN BILIRUBIN WITH OBETICHOLIC ACID IN PRIMARY BILIARY CHOLANGITIS PATIENTS WITH HIGH BASELINE BILIRUBIN**

1David Shapiro, 2Gideon Hirschfield, 3Mitchell Shiffman, 4Albert Pares, 5Elizabeth Smoot Malecha, 6Richard Pencek, 7Leigh MacConell. 1Intercept Pharmaceuticals, Inc, San Diego, USA; 2University of Birmingham, Birmingham, UK; 3Liver Institute of Virginia, Newport News, USA; 4Hospital Clinic University of Barcelona, Barcelona, Spain

**Introduction** In patients with primary biliary cholangitis (PBC), bilirubin (BILI) is a recognised marker of disease progression and a strong predictor of survival. Recently, the Global PBC Study Group reported risk with elevated BILI extends into the normal range with a cutoff of 0.67x ULN identifying patients at risk. Obeticholic acid (OCA) is indicated for treatment of PBC in patients with inadequate response or intolerability to ursodeoxycholic acid. This retrospective analysis aimed to evaluate the effect of OCA on BILI in this patient subpopulation.

**Methods** OCA has been evaluated in patients with PBC in one 12 month (mo) Phase 3 double-blind (DB) placebo (PBO)-controlled trial (POISE) and two 3-mo Phase 2 PBO-controlled trials (201 and 202). Patients were eligible to continue treatment in open-label extensions (OLE) with all patients receiving OCA. Patients from the Phase 2 and 3 trials with baseline (BL) total BILI (TBILI) >0.67x ULN were evaluated for change in TBILI over 12 mo in the following manner: 1) DB comparison of OCA vs PBO at 12 mo in POISE and 2) DB + OLE OCA use totaling 1 year of treatment (POISE randomised to PBO, evaluated at 12 mo OLE; Phase 2 randomised to OCA for 3 mo, evaluated at 9 mo OLE; and Phase 2 randomised to PBO, evaluated at 12 mo OLE).

**Results** The analysis included patients with TBILI >0.67 x ULN at their OCA BL: POISE, n=51; 201, n=7; and 202, n=7. In patients with BL TBILI >0.67 x ULN, TBILI increased after 12 mo of PBO treatment, and decreased after 12 mo of OCA (table 1). In the DB phase of POISE, of the 7 PBO and 9 OCA patients with abnormal TBILI at BL, 14% of PBO and 78% of OCA patients attained normal TBILI levels after 12 mo. Further, of 10 PBO and 20 OCA patients with normal TBILI at BL, 60% of PBO and 15% of OCA patients worsened to abnormal TBILI after 12 mo.

**Conclusions** Patients treated with OCA had a trend toward reduction of TBILI compared with those treated with PBO. These data suggest that OCA may reduce progression of patients with more advanced liver disease.
Table 1

<table>
<thead>
<tr>
<th>12 Mo Treatment</th>
<th>PBO</th>
<th>OCA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase</td>
<td>DB</td>
<td>OLE</td>
</tr>
<tr>
<td>Study</td>
<td>POISE</td>
<td>201</td>
</tr>
<tr>
<td>Dose (mg)</td>
<td>5–10</td>
<td>10</td>
</tr>
<tr>
<td>n</td>
<td>17</td>
<td>15</td>
</tr>
<tr>
<td>Mean (SD) change from BL in</td>
<td>2.6</td>
<td>−3.3</td>
</tr>
<tr>
<td>TBIL (μmol/L)</td>
<td>(6.5)</td>
<td>(3.6)</td>
</tr>
</tbody>
</table>

OCA BL: OCA-randomised patients: if time from last DB visit to first OLE visit <30 days, mean of evaluations prior to first DB dose is used; if >30 days, last assessment prior to first dose in OLE is used; the initial OLE visit is included as a baseline evaluation.

Introduction Identification of patients with acute-on-chronic liver failure (ACLF) who will benefit from ongoing support on intensive care unit (ICU) remains a challenge. There is no agreed marker of futility or time-point. There has been recent consensus regarding the definition of ACLF grades, and chronic liver failure-sequential organ failure assessment (CLIF-SOFA) score has been adopted. We aimed to determine if evolution in CLIF-SOFA or other markers of disease severity can predict mortality and survival in ACLF patients admitted to ICU.

Methods Prospectively recorded data was collected on 48 ACLF patients admitted to ICU at Guy’s and St Thomas’ hospital, a tertiary non-transplant centre, from May 2013 – May 2016. Scores were calculated at D0, D2, D5, D7.

Results The majority were male (n=34,700.8%), mean age was 57.4±10.3 years and major aetiologies were ALD (n=34,700.8%) and viral hepatitis (n=11,290.2%). The major aetiologies were ALD and viral hepatitis at D2 and D5 or D7. The best predictive model proved to be difference in CLIF-SOFA between D2 and D5 or D7. The mean delta C-SOFA D2-D5 was −2.25±1.9 and mean delta C-SOFA D2-D7 was −3.36±2 for survivors compared to 0.19 ±1.73(p<0.001) and 0.2±5.8(p=0.001) for deceased at 90 days, with area under curve (AUC) of 0.839 and 0.835, respectively.

The mean survival time (days) for patients with improvement in delta C-SOFA between D2 and D5/D7 was 837 ±144 and 814±149 vs patients with worsening or static scores 33.8±14.5 (p<0.001) and 37.6±18(p<0.001). The negative predictive value at D5 and D7 was 95.5% and 94.1%, respectively.

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Other prognostic scores at a single time point on D7 predicted survival at D28 and D90 with AUC of: CP (0.75/0.67), MELD (0.73/0.79), UKELD (0.79/0.84), ACLF (0.75/0.78) and CLIF-SOFA (0.75/0.83).

Conclusions The evolution in CLIF-SOFA score between D2 and D5/7 is superior to evolution in other scores and scores assessed at single time points when predicting 90 day survival. The delta C-SOFA at D5 and D7 are comparable, thus delta C-SOFA D2-D5 may be used to guide therapeutic decisions.

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results Significant associations were found, in men, between the risk of developing khat-related CLD and CYP2D6: rs3892097 (p = 0.029; odds ratio (OR) = 2.61 [95% confidence interval (CI) 1.1–6.2]) and CYP2D6:rs1065852 (p = 0.039; OR = 2.42 [95% CI 1.1–5.6]). These two SNPs are in close linkage disequilibrium (r² = 0.8). The associations were not significant in women. No significant associations were identified between PNPLA3:rs738409, TM6SF2:rs58542926 and MBOAT7:rs641738 and either the overall or sex-specific risk of developing khat-related CLD. Conclusions Carriage of rs3892097 and rs1065852 in CYP2D6 is associated with an increase in the risk of developing khat-related CLD. The male specificity of this association is unexplained; more extensive exploration of CYP2D6 variants in population at risk is warranted.

**PWE-083** THE SPECIFICITY OF THE ELECTROENCEPHALOGRAM FOR DIAGNOSING HEPATIC ENCEPHALOPATHY IN PATIENTS WITH CONFOUNDBING COMORBIDITIES

Sami Hussain, Harry Zacharias, Clive Jackson, Marsha Morgan. UCL Institute for Liver and Digestive Health, University College London, UK; Department of Neurophysiology, Royal Free Hospital, London, UK

Introduction Hepatic encephalopathy is a common complication of chronic liver disease; it is characterised by impairment in neuropsychiatric/neurophysiological performance. However, other chronic conditions such as renal failure, chronic pulmonary disease and diabetes are also associated with the development of metabolic encephalopathies and show similar abnormalities. Difficulties can, therefore, arise in determining the aetiology of cognitive impairment in patients with cirrhosis if they have these additional co-morbidities. The aim of this study was to evaluate the specificity of the tests used to diagnose hepatic encephalopathy in patients with cirrhosis.

Methods The study population comprised of clinically stable patients with: (i) cirrhosis (n=52); (ii) end-stage renal failure (n=15); (iii) chronic renal failure (n=15); and, (iv) poorly controlled type II diabetes mellitus. All participants were assessed in one sitting, under standardised conditions, with a comprehensive test battery including: electroencephalography (EEG); Critical Flicker Fusion Test; and the computer-based Inhibitory Control Test (ICT), Stroop Test (EncephalApp) and Scan Package. Results were compared with appropriately age and sex-matched healthy volunteers (n=53) correcting for multiple testing.

Results Significant abnormalities were observed across all test systems in the four patient groups compared with healthy controls. However, EEG abnormalities were only observed in the patients with cirrhosis (table 1).

Conclusions The presence of co-morbidities may confound the assessment of cognitive function in patients with cirrhosis; the presence of EEG abnormalities would signal a major hepatic component.

### Abstract PWE083 Table 1 Neuropsychometric/neurophysiological abnormalities in patients with various chronic diseases

<table>
<thead>
<tr>
<th>Test Variables</th>
<th>Healthy (n=53)</th>
<th>Cirrhosis (n=52)</th>
<th>Renal (n=15)</th>
<th>Pulmonary (n=15)</th>
<th>Diabetes (n=15)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PHES</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Z-score</td>
<td>0±1</td>
<td>-0.99±1.5</td>
<td>-0.63±1.3</td>
<td>-1.34±1.2</td>
<td>-0.88±0.9</td>
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<tr>
<td><strong>EEG</strong></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Theta PIP4 (µs)</td>
<td>16.5±6.0</td>
<td>***</td>
<td>*</td>
<td>***</td>
<td>*</td>
</tr>
<tr>
<td>Flicker Frequency (Hz)</td>
<td>33.8±3.6</td>
<td>***</td>
<td></td>
<td>***</td>
<td></td>
</tr>
<tr>
<td>Inhibitory Control Test</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correct Target</td>
<td>96.8±5.6</td>
<td>90.1±4.4</td>
<td>85.9±17.7</td>
<td>87.9±15.4</td>
<td>86.3±17.1</td>
</tr>
<tr>
<td>Responses (%)</td>
<td>±5.0</td>
<td>±5.0</td>
<td>±5.0</td>
<td>±5.0</td>
<td>±5.0</td>
</tr>
<tr>
<td>Scan Package</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean Reaction Time (ms)</td>
<td>1270±238</td>
<td>**</td>
<td>**</td>
<td>***</td>
<td>***</td>
</tr>
<tr>
<td>Stroop Test</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>On Time (s)</td>
<td>88.2±106.3</td>
<td>28.8±11.8</td>
<td>110.6±21.4</td>
<td>104.8±31.4</td>
<td>112.1±25.1</td>
</tr>
</tbody>
</table>

#### Significance of the difference between healthy controls and patient groups

- *p<0.05; **p<0.01; ***p<0.001

The specificity of the electroencephalogram for diagnosing hepatic encephalopathy in patients with confounding comorbidities

Sami Hussain, Harry Zacharias, Clive D Jackson, Marsha Y Morgan

1 UCL Institute for Liver and Digestive Health, Department of Medicine, Royal Free Campus, University College London; 2 Department of Neurophysiology, Royal Free Hospital, Royal Free London NHS Foundation Trust, London, UK

**PWE-084** RELATIONSHIP BETWEEN INDICES OF FRAILTY/ DISABILITY WITH DISEASE SEVERITY AND NUTRITIONAL STATUS IN PATIENTS WITH CIRRHOSIS

Priya Dhar, Lynda Greenslade, Rachel Westbrook, Clive D Jackson, Aileen Marshall, Marsha Yvonne Morgan. UCL Institute for Liver and Digestive Health, University College London; The Sheila Sherlock Liver Centre, Royal Free Hospital, London, UK; Department of Nutritional Sciences, Royal Free Hospital, London, UK

Introduction Disease severity and nutritional status are important determinants of outcome in patients with cirrhosis. Health-related quality of life, mental health, disability and frailty all affect outcome. However it is unclear if these measures of functional decline provide information additional to that provided by conventional outcome measures. This study aimed to determine whether indices of functional decline correlate with nutritional status and disease severity.

Methods Eighty-six consecutive patients (mean [range] age 54.6 [24–81] yr; 59 men; mean MELD 12.7 [6–37]) attending the hepatology service at the Royal Free Hospital, London...
were included. All underwent the following assessment in a single sitting: disease severity: MELD; nutritional status: The Royal Free Hospital-Nutritional Prioritising Tool (RFH-NPT); quality of life: Chronic Liver Disease Questionnaire (CLDQ) and Euro Quol-5 Dimension Tool (EQ-5D); mental health: Beck Anxiety/Depression Indices (BAI; BDI); disability: Activities (ADL) and Independent Activities of Daily Living (IADL); frailty: Clinical Frailty Scale (CFS), Short Physical Performance Battery (SPPB) and Fried Frailty Index (FFC) plus two composite measures, the Bristol Prognostic Index and Karnofsky Age MELD Model (KAM).

Results There was a significant degree of cross correlation between the tools used to assess functional decline ([R] between 0.03–0.58). There were significant correlations between indices of functional decline and nutritional status with the exception of the disability indices (table 1). However, only the Bristol and KAM tools, which contain a measure of disease severity, correlated with MELD.

Conclusion In patients with cirrhosis indices of functional decline correlate with nutritional status but not with disease severity. These indices likely provide information of value in determining outcome not captured using conventional outcome measures. Information on their predictive validity would help determine their clinical utility.

**Abstract PWE084 Table 1** Functional decline, disease severity and nutritional status

<table>
<thead>
<tr>
<th>Tool</th>
<th>MELD</th>
<th>RFH-NPT</th>
<th>r (p value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLDQ</td>
<td>0.04 (0.74)</td>
<td>–0.33 (0.00)*</td>
<td></td>
</tr>
<tr>
<td>EQ-5D-SL</td>
<td>–0.07 (0.55)</td>
<td>–0.86 (0.00)*</td>
<td></td>
</tr>
<tr>
<td>BAI</td>
<td>0.03 (0.78)</td>
<td>0.31 (0.01)*</td>
<td></td>
</tr>
<tr>
<td>BDI</td>
<td>0.13 (0.26)</td>
<td>0.38 (0.00)*</td>
<td></td>
</tr>
<tr>
<td>ADL</td>
<td>–0.14 (0.22)</td>
<td>–0.15 (0.14)</td>
<td></td>
</tr>
<tr>
<td>IADL</td>
<td>–0.11 (0.30)</td>
<td>–0.19 (0.08)</td>
<td></td>
</tr>
<tr>
<td>CFS</td>
<td>0.07 (0.52)</td>
<td>0.41 (0.00)*</td>
<td></td>
</tr>
<tr>
<td>SPPB</td>
<td>–0.2 (0.09)</td>
<td>–0.38 (0.00)*</td>
<td></td>
</tr>
<tr>
<td>FFC</td>
<td>0.04 (0.7)</td>
<td>0.47 (0.00)*</td>
<td></td>
</tr>
<tr>
<td>Hand Grip</td>
<td>0.01 (0.96)</td>
<td>–0.21 (0.06)*</td>
<td></td>
</tr>
<tr>
<td>Bristol*</td>
<td>0.28 (0.01)*</td>
<td>0.32 (0.00)*</td>
<td></td>
</tr>
<tr>
<td>KAM*</td>
<td>0.34 (0.00)*</td>
<td>0.37 (0.00)*</td>
<td></td>
</tr>
</tbody>
</table>

*p<0.05

*includes disease severity.

**PWE-085 IMMUNE CHECKPOINT INHIBITOR INDUCED ACUTE LIVER INJURY – A NATIONAL COHORT STUDY**

1Rooshi Nathwani, 2L Au, 3C Barlow, 4T Tillett, 5R Bowen, 6L Spain, 7J Thomas, 8M Backhouse, 9A Gurng, 10R Morrison, 11C Cross, 12C Herbert, 13R Goldin, 14M Gore, 15J Larkin, 16S Turajic, 17C Antoniades. 1Imperial College London, London, UK; 2The Royal Marsden Hospital, London, UK; 3Musgrove Park Hospital, Taunton, UK; 4Royal United Hospitals Bath NHS Foundation Trust, Bath, UK; 5The Royal Liverpool University Hospital, Liverpool, UK; 6University Hospitals Bristol NHS Foundation Trust, Bristol, UK.

**Background** Immune checkpoint inhibitors (CPI) against lymphocyte antigen-4 (CTLA-4) and programmed cell death-1 (PD-1) are a novel therapeutic breakthrough in an increasing number of malignancies. CPI induced acute liver injury (ALI) is the second most frequently encountered organ toxicity occurring in up to 30% patients. There are no reported data on ALI disease pathogenesis, clinical evolution and outcome of patients treated with CPI therapy. Our multicentre cohort study evaluated clinico-pathological aspects of CPI-induced ALI.

**Method** A retrospective analysis was performed of patients with CPI induced ALI presenting to 6 UK oncology centres between 2013 and 2017. Indices of acute liver injury, treatment related complications and outcome were recorded. Severity scoring of liver injury was based on Common Terminology Criteria for Adverse Events (ALI grade 1–4).

**Results** 65% (36/57) patients received ipilimumab + pembrolizumab or nivolumab (combo group) and 35% (21/57) pembrolizumab or nivolumab alone (mono group). Median treatment duration to development of ALI was 96 days in the mono and 22 days in the combo group. All patients presented with acute elevations in transaminases (ALT 325 [155–543], ALP 111 [72–250]). Immungolulins and autoantibodies were normal. One patient developed acute synthetic dysfunction with no encephalopathy (Bilirubin 64, INR 1.5). 79% received steroids (mean dose:1.3 mg/kg); 34% MMF. Steroid refractory ALI was treated with anti-thymocyte globulin (ATG) in 4 patients.

Pathological findings (n=6 liver biopsies) revealed lobular hepatitis and myelo-lymphoid cell infiltrate/aggregates (CD3+, CD8+,CD68+). Patients with severe, refractory (grade 4) ALI had significant reductions in circulating lymphocytes/monocytes. 63% (n=35) had a temporal association between recent infection and ALI. 15% (n=8) had colitis prior to onset of ALI. Anti-TNF-a administration for colitis was not associated with more severe ALI. 21% (n=11) developed bacterial infections. Fungal sepsis (aspergillus) occurred in all ATG (n=4) treated patients.

Overall 14 patients died with 93% (n=13) due to disease progression and 7% (n=1) due to immunotherapy related neuropathy. All deaths due to progressive disease were in patients with grade 3–4 ALI. Actuarial median survival was significantly lower in grade 3–4 (14.5 months) vs grade 1–2 (25 months) liver injury.

**Conclusion** Our data report on the largest cohort of CPI induced ALI identifying disease evolution, markers of disease severity and strong correlation with increased morbidity and mortality. Further research is required to delineate triggers and pathogenesis of CPI induced ALI in order to develop calibrated therapies to ameliorate liver injury.

**PWE-086 IMPROVING IDENTIFICATION AND MANAGEMENT OF ALCOHOL-RELATED BRAIN INJURY (ARBI) IN ACUTE CARE SETTINGS**

1Paul Richardson, 2Andrew Thompson, 3Cecil Kulla, 4Fiona Ogdan-Forde, 5David Byrne, 6Kev Patterson, 7Lynn Owens. 1Royal Liverpool University Hospital Trust, Liverpool, UK; 2University of Liverpool, Liverpool, UK; 3Liverpool CCG, Liverpool, UK; 10.1136/gutjnl-2018-BSGAbstracts.223

**Background** Immune checkpoint inhibitors (CPI) against lymphocyte antigen-4 (CTLA-4) and programmed cell death-1 (PD-1) are a novel therapeutic breakthrough in an increasing number of malignancies. CPI induced acute liver injury (ALI) is the second most frequently encountered organ toxicity occurring in up to 30% patients. There are no reported data on ALI disease pathogenesis, clinical evolution and outcome of patients treated with CPI therapy. Our multicentre cohort study evaluated clinico-pathological aspects of CPI-induced ALI.

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**Conclusion** Our data report on the largest cohort of CPI induced ALI identifying disease evolution, markers of disease severity and strong correlation with increased morbidity and mortality. Further research is required to delineate triggers and pathogenesis of CPI induced ALI in order to develop calibrated therapies to ameliorate liver injury.

**Introduction** Alcohol Related Brain Injury (ARBI) is a hidden harm in drinkers. The most commonly used clinical definition is given in DSM IV, however this has been shown to be vague and subjective with poor utility in acute care settings. Estimates of prevalence have been reported at 0.03% per 3 000 000 however, as no routine, standardised algorithm for assessment of ARBI exists; this is most likely an underestimate. A systematic review of brain injury confirmed neurodegenerative changes in heavy drinkers, but importantly also
highlighted the potential for reversibility of these changes with sustained abstinence. Therefore, recognition of ARBI at the earliest opportunity has the potential to facilitate the implementation of comprehensive care pathways that optimise medical and psychosocial care, and prevent the cycle of readmissions for increasingly complex physical and psychological harms.

Methods In April 2017 we implemented an innovative clinical pathway. Patients meeting risk criteria based on number of previous admissions or carers concerns had an automatic referral to a specialist nurse for assessment utilising the Montreal Cognitive Assessment tool (MoCA®). A score of <23 was considered positive for potential ARBI. This triggered initiation of our ARBI care pathway and a referral to a psychiatrist for confirmation of diagnosis. We performed a 3 month follow-up descriptive evaluation.

Results Over an period of 8 months (April to Nov 2017) 163 patients met criteria for screening; 118 males and 45 females, mean age 52 years (SD=11); range 26–80 years, 60 scored ≤23 (36.8%) of which 35 (58.3%) had a confirmed diagnosis of ARBI from a psychiatrist. At 3 months 22 patients had received follow-up. Compared with baseline MoCA scores were significantly higher (improved); mean difference=3.7 (95%CI: 1.2 to 6.3; p=0.07), mean hospital attendance was reduced from 3.2 to 1.9, and mean admissions were reduced from 1.8 to 1.1. Results from family reported outcome measures (FROMS) has highlighted several outcomes that our patient families found most valuable; a) receiving an assessment to confirm or reject the presence of ARBI, b) helping them understand their loved ones condition c) helping them plan for the future.

Conclusions We have demonstrated potential benefits of this point-of-care screening which can facilitate the initiation of referral and treatment pathways which can improve patient outcomes. Our Results are descriptive, but may contribute to the design of clinical trials that are needed to determine utility, acceptability and validity of our Methods and the MoCA as a screening instrument in this setting.

PWE-087 A REVIEW OF PRESCRIBING FOR PRIMARY ANTIBIOTIC PROPHYLAXIS IN SPONTANEOUS BACTERIAL PERITONITIS

Camilla Rhead, Alastair O’Brien. UCL Division of Medicine, London, UK

Introduction The use of antibiotics as primary prophylaxis for spontaneous bacterial peritonitis in decompensated liver failure is an area of uncertainty and conflicting opinion. Concerns regarding increasing anti-microbial resistance (AMR) alongside lack of evidence for antibiotic choice are cited as reasons for this. Spontaneous bacterial peritonitis (SBP) is the most common serious infection in cirrhosis with significant mortality. While antibiotic prophylaxis to prevent further infection is established following a prior episode of SBP, there remains considerable uncertainty over primary prophylaxis for SBP.

This is important as 90% of SBP cases present in those with no previous episode.

Methods We conducted a national survey of primary prophylaxis for SBP through the British Society of Gastroenterology trial development group with responses from 23 centres. We requested information on the centres’ current guidelines and criteria for prescription.

Results Nine centres reported that they routinely used antibiotics as primary prophylaxis for SBP; seven did not routinely prescribe and seven responded that they intermittently prescribe prophylaxis on a case-by-case or clinician dependent basis. The antibiotics prescribed were ciprofloxacin (60%), norfloxacin (20%) or cotrimoxazole (20%). Two hospitals used rifaximin as combined prophylaxis against hepatic encephalopathy (HE) and SBP. The majority (eight) of the centres with trust guidelines for prescription included patients with ascitic fluid protein <1.5 g/dl or Childs score B or C.

Conclusions Responses demonstrated a wide variation in clinical practice between both centres and clinicians. Respondents indicated that due to lack of clear evidence, prescription was frequently on a case-by-case basis, often influenced by previous personal experience. They highlighted the increasing concerns from the participating hospitals’ microbiology departments over the use of quinolones due to the risks of selecting drug resistant organisms and *C. difficile* associated diarrhoea. Rifaximin is licensed in use for HE but may have beneficial role in SBP prevention without the high risk of drug resistance, however high costs remains a barrier to its use.

SBP continues to be a significant problem in the management of patients with decompensated liver failure. The Results from these centres demonstrate an evident lack of clarity over the optimum strategy for primary prophylaxis throughout the United Kingdom and hence the need for further high quality research to provide clear guidelines.
show increased markers of liver injury or whole liver dysfunction.

Methods eDISH Methodology was applied to 278 patients treated with placebo (n=140) or 25 mg OCA (n=138) from FLINT and 84 patients treated with placebo (n=21), 5 mg OCA (n=20), 10 mg OCA (n=21), or 25 mg OCA (n=22) from CONTROL. Individual peak of ALT and total bilirubin values during the double-blind treatment phase were plotted as log_{10} values of multiples of elevations above the upper limit of the normal (xULN).

Results Overall, no OCA-treated patients were in the Hys’ law quadrant (>3 x ULN for ALT and >2 x ULN for total bilirubin) compared with 1 placebo-treated patient in FLINT. The proportion of patients with peak ALT and total bilirubin values in the lower left quadrant (representing normal or near normal range) was higher in OCA-treated patients compared with placebo (FLINT: 91% OCA vs 84% placebo; CONTROL: 91% OCA vs 86% placebo). 8% of OCA-treated patients from both FLINT and CONTROL presented in the Temple’s corollary quadrant (>3 x ULN for ALT and <2 x ULN for total bilirubin) vs 14% (in both studies) for the placebo-treated patients. Across both studies (n=362), 4 patients were in the cholestasis quadrant (>2 x ULN total bilirubin and <3 x ULN for ALT); 1 placebo-treated patient and 3 OCA-treated patients, including 1 patient with Gilbert’s syndrome.

Conclusions In these 2 placebo-controlled, double-blind NASC studies, the eDISH analysis showed no trend for liver injury with OCA at doses up to and including 25 mg.

Evaluation of Drug-Induced Serious Hepatotoxicity

**PWE-090** WEST MIDLANDS MULTI-CENTRE TRAINEE-LED AUDIT IN THE ASSESSMENT, MANAGEMENT AND PROPHYLAXIS OF SPONTANEOUS BACTERIAL PERITONITIS

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Introduction Spontaneous bacterial peritonitis (SBP) is a common but potentially fatal complication in patients with cirrhosis and ascites. In the first audit performed by West Midlands Research in Gastroenterology (WMRIG) trainees, we aimed to assess practice of assessment, management and primary and secondary prophylaxis of SBP according to national standards, in addition to the feasibility of regional project delivery.

Methods This trainee-led, retrospective, multi-centre study identified patients admitted with cirrhosis and ascites between Sep-Dec 2016. Outcomes of SBP and mortality were retrospectively collected for up to 1 year (median 8 months). Practice was audited against EASL, BSG and NICE standards. Heterogeneity between sites was assessed with chi^2 and time-to-event analyses undertaken using Kaplan-Meier plots.

Results Trainees across 8 West Midlands hospitals identified 227 patients (mean age 58; SD 13; 65% male) with 282 admissions. Cirrhosis was attributed to alcohol (79%), NAFLD (10%), autoimmune (4%) and viral (3%). 18% were elective admissions and 7% had a previous history of SBP. Ascitic aspirates were performed in 83% (range: 60%–92%, p=0.019), in <24 hours in 64% (range: 49%–85%, p=NS), and cultures sent in 55% (range: 11%–86%, p<0.001). 16.8% of aspirates met criteria for SBP: antibiotics were commenced in 92% (p<0.001), Day 1 albumin in 64% (p=NS), Day 3 albumin in 40% (p=NS), and secondary prophylaxis in 44% (p=NS).
Repeat aspirate to ensure SBP resolution was performed in 33% (range: 0%–52%, p=NS). In patients without SBP, ascitic protein was measured in 46% (not available from 3 Trusts). 32 (67%) met criteria for primary prophylaxis (protein ≤ 15 g/L); which was commenced in 4 (13%, range 0%–100%, p=NS). Mortality occurred in 51%. SBP was associated with lower median survival (79 days vs. non-SBP: 190 days, p=0.045) [Abstract PWE090 figure 1]. Emergency admission (HR 8.4, p=0.039), older age (HR 1.03 per increase, p=0.017) and ascitic protein level ≤ 15 g/L (HR 2.27, p=0.042) were multivariate predictors of reduced survival. SBP occurred after discharge in 8 patients (4%) after a median interval of 32 days.

Conclusions Our pilot study has been successful in highlighting deficiencies and variations in the assessment, management and prophylaxis of SBP. These results will inform and prioritise future regional quality improvement strategies to improve outcomes in patients with advanced chronic liver disease.

Abstracts

PWE-091
L-ORNITHINE L-ASPARTATE IN MINIMAL HEPATIC ENCEPHALOPATHY: POSSIBLE EFFECTS ON THE BRAIN-MUSCLE AXIS?

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Introduction L-Ornithine L-Aspartate (LOLA) is an ammonia-lowering agent for treatment of hepatic encephalopathy (HE); it may reduce sarcopenia. We investigated 12 weeks of oral LOLA in patients with compensated cirrhosis and minimal HE (MHE).

Methods Consecutive patients were pre-screened with paper-and-pencil-based psychometric testing (PHES test) and included if performance was impaired to a level of ≤ 4 or worse. 34 English-speakers were included; 12 randomised to 12 weeks oral LOLA 6 g tds, 22 randomised to identical-looking placebo. At baseline, 4 and 12 weeks, subjects had PHES, a computerised battery: Cogstate™ and SF-36 health questionnaires. Markers of muscle function were recorded: handgrip strength, skin fold thickness, and 6-minute-walk-test. Subjects had cerebral T1 and T2 MRI, functional MRI (fMRI) with motor/cognitive tasks/resting state studies; and 1H MRS. LC Model software was used for metabolic identification.

Results On SF-36, 57% on LOLA reported better energy levels than placebo 0.04% (P-value<0.001). Better concentration was reported by 21% in treatment arm vs none in placebo group (p=0.05). 28% reported improved memory in treatment group vs 0.04% with placebo. Sleep improvements were reported by 35% in treatment arm vs 0.09% on placebo (p=0.05). In both groups, changes in total PHES score and Cogstate™ were non-significant. PHES test sub-analysis of the Digit-Symbol showed significant improvement in performance in LOLA-treated group (p=0.05). Biceps skinfold thickness showed a mean gain of 1.5 mm in the LOLA group with mean loss of 1.0 mm (p=0.05) in placebo. No differences were found in other skinfolds, hand-grip or 6-minute-walk-test. On T1 cerebral MRI, significant volume reduction was seen in left lateral ventricle, right globus pallidus and mid-anterior corpus callosum (ACC). fMRI tasks did not vary between groups. 1H MRS of ACC showed significant changes in glutamate concentration (p=0.03), after LOLA.

Conclusion After 12 weeks LOLA, patients reported a highly significant improvement in energy levels and concentration. Although 12 weeks LOLA had no overall effect on psychometric performance, significant treatment-related improvement in digit-symbol PHES subtest in those receiving LOLA was seen. An increase was noted in biceps skinfold thickness, which may indicate improved nutrition. Subcortical brain areas showed volume reduction, an observation not previously noted in imaging studies of patients receiving this drug. Unlike previous studies, no functional changes were seen, but significant changes were found on MRS of ACC, a region known to be metabolically active in mHE. It may be that a larger dose of LOLA would have shown greater effects on psychometric performance.
**Results** Of 121 patients offered a choice of home or hospital based care by January 2018, 97 (80%) elected to receive treatment at home. This group did not differ significantly in age, gender, HCV genotype or choice of DAA from those treated in the hospital clinic. 14 homecare patients met Fibroscan criteria for cirrhosis. Of the 97 patients so far started on treatment, 57 have completed, 31 achieved SVR and 4 have failed treatment. Three patients withdrew from the study for reasons unrelated to homecare and one transferred back to hospital care. 18 feedback questionnaires have been received from 56 so far sent (32%). All respondents stated that the service had lived up to or exceeded expectations, and was particularly valued by patients living distant from the hospital.

**Conclusions** Homecare provides a safe, transferrable and scaleable treatment option which is preferred by patients. The strategy of pharmacy based implementation and economies of staff time intrinsic to the homecare model will relieve pressure on hepatitis services, and allow specialist teams to focus on patients with severe co-morbidities and promoting models for case finding and community care for harder to reach groups with HCV infection.

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**PWE-093**

**TREATMENT OF GASTRIC FUNDAL VARICES WITH EUS GUIDED EMBOLISATION COMBINING COIL PLACEMENT WITH THROMBIN INJECTION**

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**Introduction** Gastric varices are present in 5%-33% of patients with portal hypertension with incidence of bleeding of around 25% in 2 years. If gastric varices are identified as the source of bleeding, therapeutic options include endoscopic Methods, TIPSS, surgery and non-selective beta blockade. There are reports of EUS guided coiling combined with cyanoacrylate glue but limited literature on safety and efficacy of EUS guided coil embolisation with human thrombin injection. We report our experience.

**Methods** We analysed data of all EUS guided interventions for the management of bleeding gastric varices between 2015-2017 at a liver transplant centre. Olympus EUS linear scope was used to inject human thrombin (Tisseele; 500IU/ML) in gastric varices with or without coils (Nester Embolization Coils).

**Results** A total of 10 EUS guided interventions in 6 patients (4 M and 2 F), aged 55 (41-59) yrs for secondary prophylaxis. 67% patients had cirrhosis with MELD score of 14(10-21) and 75% were Child-Pugh class C. The remainder had non-cirrhotic portal hypertension. All patients had previous bleeding from gastric varices and 2/3rd were intolerant of beta-blockers. 67% had previous thrombin injection that had failed to obliterate the gastric varices. EUS guided coil embolisation was undertaken with thrombin injection in 6, and thrombin alone in 4 (2 had previous coils embolisation). The largest feeding vessel was 12(7-16) mm with a median 5 (2-10) coils placement followed by thrombin injection of 3500 (2500-5000) IU.

Most (8/10) stayed overnight after intervention and only 2 required longer stays, Median F/U was 9 (3-20) months with zero 30 day mortality. 1 patient had fever 2 days post procedure requiring IV antibiotics. No reported episodes of re-bleeding except in 1 patient at 23 months. 4 had follow up EUS (5-7 months) and showed no flow at the level of the coils. 1 patient died within 3 months of procedure secondary to hepatic decompensation.

**Conclusions** In our experience EUS guided coil embolisation and injection of thrombin, is a technically safe and well-tolerated procedure even in patients with advanced liver disease especially who have failed eradication of gastric varices from single modality therapy. Due to the lower incidence of gastric variceal bleeding in comparison to oesophageal varices bleeding, we recommend multi-centre prospective data collection evaluating the modalities being used and reporting of outcomes to help inform national guidelines.

**REFERENCES**

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**PWE-094**

**HEPATITIS-C INFORMATION CARDS DISTRIBUTED THROUGH COMMUNITY PHARMACIES ARE INEFFECTIVE IN INCREASING HCV TESTING AMONGST PWID**

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**Introduction** Despite being a high risk group for hepatitis C virus (HCV) infection, People Who Inject Drugs (PWID) do not engage with health services. We present a low-cost intervention of issuing HCV information cards through community pharmacies without additional resource support to raise awareness of HCV testing, the new direct acting antivirals (DAA) and to increase self-referral of PWID to Substance Misuse Services (SMS).

**Methods** Brighton has a well developed and integrated community HCV clinic based at SMS.
- 1. Pharmacies in Brighton and Hove providing opioid substitution therapy (OST) and needle exchange were recruited
- 1. Cards explaining need for HCV testing, availability of DAA and contact information for community HCV nurse were provided during issue of all OST and needle exchange. A leaflet for pharmacy staff to support training needs was supplied to each pharmacy
- 2. Pharmacies were contacted via telephone after 1 month to obtain feedback
- 3. Record of self-referral was collected during 1 month

**Results**
- 1. 21 Pharmacies were recruited and participated in the project
- 2. 1415 cards were given to the pharmacies of which 950 were issued to clients
- 3. 17 pharmacies provided feedback

- All pharmacists supported this initiative though due to lack of resources were unable to allocate additional time to reinforce the message to clients
- A considerable number of longterm OST clients had already been tested as they were in contact with SMS. Some raised concerns about testing as they linked testing to monitoring of their OST

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Transient and newly started OST clients were more difficult to engage as the relationship with the pharmacy had not sufficiently evolved
The needle exchange clients were difficult to engage and often refused the card
One pharmacy was able to provide the intervention as part of their counselling sessions to some of the clients and found increased engagement in this environment
4. No client contacted the community hepatitis nurse within the month monitored

Conclusions Our low cost intervention in community pharmacies to increase HCV testing resulted in not a single PWID referring themselves. While in principle community pharmacies are willing to engage in strategies to increase HCV testing amongst PWID, this was hindered by lack of time and resources.
PWID, especially those who are actively injecting and those newly referred remain highly vulnerable and disenfranchised. This makes it unlikely that they will engage with healthcare professionals in an environment that they are not comfortable with. Our data suggests that opportunistic testing for PWID in pharmacies is likely to fail unless additional resources are allocated, specifically provision of education, testing, and treatment at one site and the need for dedicated individuals to deliver such a service.

**Hepatitis E in Northeast of England: 5 Year Review of Cases at a Tertiary Centre**

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Introduction The incidence of Hepatitis E virus (HEV) infection has risen sharply in Europe in recent years, largely due to a rise in indigenous genotype 3 infections. Few studies have determined the clinical outcomes of HEV infection in the UK. Our aim was to review all cases of hepatitis E admitted to our unit in 5 years to determine the clinical consequences of these infections.

Methods All confirmed serological cases of HEV (IgG, IgM and RNA) between Jan 2012 and Sept 2017 were identified from our virology laboratory. Medical notes of all acute or chronic cases were reviewed retrospectively to determine epidemiological characteristics, clinical features and outcomes of the infections.

Results From a total of 206 cases had serological evidence of HEV infection, 104 were confirmed acute HEV (IgM and/or HEV RNA positive). The number of cases/year ranged from 12–27. The median age at presentation was 54 (21–94) years and 70% were >50 years. 68% of cases were male. 24% of acute HEV cases occurred in immunocompromised individuals. 60% of the patients developed jaundice and the median bilirubin levels was 70 (4 – 558) μmol/L. 2 patients had bilirubin >500 μmol/L. The median ALT level was 1084 (range 22–6026) U/L. Serum ALT levels>500 in 57% and >5000 in 3%. No cases of fulminant liver failure were seen. 8 cases became chronic (HEV viremia >3 months), all in immunocompromised individuals (50% haematological malignancies 50% solid organ transplants). All 8 patients were treated with ribavirin with 5 (63%) achieving sustained virological response. One patient with a delayed diagnosis of HEV developed progressive liver failure and required Liver transplantation despite ribavirin. One relapsed following 3 months ribavirin and then was a non-responder to 6 months ribavirin and 6 months PEG-interferon +ribavirin. One was non-responder to 18 months ribavirin.

Conclusion Symptomatic HEV is relatively common in the North East of England leading to jaundice and significant transaminitis in the majority. Chronic infection developed in a quarter of immunosuppressed individuals and can progress to clinically significant disease.

** Provision of TIPS for Variceal Haemorrhage in North East of England**

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Introduction The North East encompasses a wide geographical area, the farthest hospital being 160 km from the specialist centre providing transjugular intrahepatic portosystemic shunt (TIPS). We aim to evaluate factors influencing provision of the TIPS service and outcome in the region.

Method All cases undergoing TIPS at Freeman Hospital from December 2015 to December 2017 were identified from the interventional radiology register. Electronic records and medical notes of all patients who had TIPS performed for variceal haemorrhage were reviewed retrospectively to collect data regarding clinical demographics, length of hospital stay and outcomes.

Results A total of 46 procedures were performed; 29 for variceal haemorrhage. Two were excluded from further analysis due to non-availability of medical notes. The median age at the time of intervention was 51 (range 21–71) years and 13 (48%) were male. Cases were referred from nine regional hospitals. The majority had alcohol related liver disease (63% alcohol, 26% Non-alcohol), 77% with Child B or C cirrhosis and 85% had MELD score >11. A third of patients had undergone one attempt at haemostatic control with another third having had ≥2 interventions prior to referral. 96% and 92% had received antibiotics and terlipressin, respectively. 56% were ITU to ITU transfers with airway protection and 52% had a Sengstaken tube in situ [average duration of placement 17 (4–48) hours]. Average time to transfer from referral was 18.3 hours. 57% had TIPS performed within 24 hours of arrival at the specialist centre. Although the average time to TIPS varied between weekends and weekdays, 46 and 35 hours respectively, there was no significant difference in outcome or survival (p=0.221). 22% required inotropic support following TIPS. Average time taken for discharge from ITU after being assessed as fit for stepping down care to the ward or repatriation was 4.45 (0–51) days. The duration of Sengstaken tube insertion >24 hours did not influence outcome or survival. 67% of patients were alive at 90 days post TIPS.

Conclusion The majority of patients received antibiotics and terlipressin during the bleeding episode consistent with good clinical practice. Time to TIPS was longer in patients admitted at weekends but with no significant difference in survival outcome. The duration of Sengstaken tube placement did not significantly influence outcome. Delays and decisions to repatriation were multifactorial, including non-availability of beds at the referring hospital, family preference to remain in centre and post TIPS complications.
**Abstracts**

**PTH-083** IMPACT OF HOSPITALISATION RATE FOR HCV RELATED LIVER DISEASES IN NORTH OF ITALY

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**Background and aims** Hepatitis C virus (HCV) epidemiological data in Italy is changing due to the decline of iatrogenic aetiology and the persistence of infection in populations at risk. The incidence and the prevalence of HCV disease have dropped following also the massive commitment of physicians to treat all the infected patients. However, all over the world HCV liver-related disease is the first cause of hospital admission in patients with liver diseases. We analysed the trend of hospitalisation for liver HCV-related disease in Veneto Region, North East Italy, from 2000 to 2016, in order to report the impact of HCV treatment with different therapeutic schedules.

**Method** This is a retrospective cohort study based on Veneto Region anonymous computerised database of hospital discharges between 2000 and 2016. All Veneto residents discharge records with principal diagnosis of hepatitis (cod. ICD9-CM: 070.41, 070.44, 070.51, 070.54, 070.70, 070.71, 571.5, 571.9) were included in the study. We chose the principal diagnosis because it is considered the primary reason for hospital admission. The Standardised Hospitalisation Ratio (SHR) per five-year age group (ref. pop. Veneto 2008) was calculated and expressed per 100 000 population.

**Results** In the period considered 36 102 hospital admissions diagnosed with HCV have been recorded. Approximately half of patients were males (56%). Despite their lower age (56.1 ±7.2 Vs. 65.1±8.3), they had the greatest hospitalisation rate (51.4 Vs. 37.9; OR:1.36;CI95%:1.33–1.39;p<0.05).The analysis of the hospitalisation trend shows a 14% increase in the average age of patients(from 57.3±9.5 to 65.1±9.9) and a substantial decrease in hospital admissions (X2 trend: 9210,736; p<0.05). Between 2000 and 2016, there has been a 81% decline in hospital admissions (i.e. from 78.9 to 14.8) with a comparable decrease in both genders/sexes (ratio M:F 1.5). In 2012–2014 period we observed a plateau in the curve while in 2015–2016 the decline starts again (Abstract PTH083 figure 1).

**Conclusion** HCV liver-related disease as cause of hospital admission is in progressive and constant decline related to the different treatment schedules available in each period. Moreover this downward trend reflects the improvement in management of advanced liver disease in outpatient settings. In the last two yrs of observation the decline starts again because of the availability of DAAs with high efficacy also in patients with advanced stage of liver disease.

**Figure**

Abstract PTH-083 Figure 1

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**PTH-084** THE EFFICACY OF TACROLIMUS AS AN ALTERNATIVE AGENT IN THE TREATMENT OF AUTOIMMUNE HEPATITIS

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**Introduction** Autoimmune hepatitis (AIH) is a chronic, inflammatory liver condition which, if untreated, can Result in liver cirrhosis. Current BSG guidelines recommend corticosteroids and azathioprine as first line therapy, with the option of switching to mycophenolate if azathioprine is not tolerated. Tacrolimus has been identified as a potential third line treatment strategy. Our aim was to review the outcomes of patients with a diagnosis of AIH who required the addition of tacrolimus as a third line agent.

**Methods** The tacrolimus database for the Regional Liver Unit, Royal Victoria Hospital was reviewed to identify all patients with AIH who had been treated with tacrolimus from Jan 2010 until August 2017. Records were cross referenced with the diagnostic coding department. Demographic details, indications for tacrolimus therapy, clinical and biochemical outcomes were recorded.

**Results** 30 patients were identified (24 (80%) female, mean age 40.7 years, range 19–81 years). 27 of the 30 patients were initially treated with azathioprine of whom 21 (78%) discontinued treatment due to adverse effects including blood dyscrasias and 6 (22%) were switched to tacrolimus due treatment failure. Three of 30 patients were started on tacrolimus instead of azathioprine or mycophenolate. Two of these patients had previous episodes of pancytopenia at the time of commencing treatment for AIH and azathioprine/mycophenolate were excluded as a treatment option. One of the patients was commenced on prednisolone and tacrolimus without another steroid sparing agent trailed for other reasons. 26 (87%) of 30 patients remain on tacrolimus, of whom 11 (42%) had normalisation of transaminases and a further 12 (46%) had improvement of transaminases. Liver function tests in the 3 (11.5%) remaining patients were deranged but static. Of note all three had established cirrhosis at the time of AIH diagnosis. Of the four whose tacrolimus therapy was discontinued, two stopped due to side effects, 1 is deceased (not tacrolimus related) and one stopped due to commencing infliximab for IBD.

**Conclusions** Tacrolimus is a safe and well tolerated treatment for AIH when first line therapy has failed. In the cohort observed, only 6% failed to tolerate tacrolimus and biochemical parameters were improved or normalised in 88% of patients who remained on tacrolimus therapy.

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**PTH-085** USING ELF TESTS IN PRIMARY AND SECONDARY CARE TO IDENTIFY PATIENTS WITH ADVANCE FIBROSIS

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**Introduction** In 2016 NICE NAFLD guidelines recommended Enhance Liver Fibrosis (ELF) as a validated test to assess advanced liver fibrosis. This study aims...
ELF tests were performed, 166 from by GP practices and 175 by UHS hepatology service. 89 were from other organisations. to assess the relationship with standard investigations used in a hepatology clinic for NAFLD patients (including transient elastography) and the newly commissioned ELF test in a real world setting.

**Methods**

The study looked at all new patients diagnosed with NAFLD via the hepatology outpatient clinic at University Hospital Southampton between November 2016 and May 2017. Each patient had their demographics (age, gender, weight) and comorbidities (diabetes, hypertension, dyslipidaemia) assessed. Transient elastography, USS and ELF Result (when performed) were reviewed.

The ELF was categorised as no/mild fibrosis if <7.5, moderate fibrosis if ≥7.5 and<10.5, advanced fibrosis if ≥10.51.

The ELF tests requested over the same period were analysed review the source of the request.

**Results**

175 people were diagnosed with NAFLD through hepatology clinic. All patients had transient elastography performed. The mean LSM Result was 14.6 (range 3.3–75), with a mean CAP score of 313.6 (range 100–400). Of 175 new diagnoses, 101 patients were male (mean weight 99 kg, median age 52 years) and 74 were female (87.1 kg and 57 years).

69 patients had type 2 diabetes mellitus, 74 had hypertension and 66 had dyslipidaemia. 30 patients had all 3 (16 were female with a mean weight 96.5 kg and mean LSM 18.5 kPa and 14 were male, 100.7 kg and 19.3 kPa).

With transient elastography, 59 patients had LSM <6 kPa, 68 were 6.1–12 kPa, 23 were 12.1–20 kPa and 25>20.1 kPa. This suggested 48 (27%) patients had advanced fibrosis or cirrhosis. The remaining 127 (73%) patients did not require hepatology review.

430The GP cohort had 18 (11%) patients with an ELF test ≥10.5 requiring hepatology review. 36 (21%) patients seen in the hepatology clinic had an ELF >10.51, the remaining 139 (79%) patient did not require a hepatology review.

**Conclusions**

This study looked at the cohort of new diagnoses of NAFLD in a teaching hospital using standard tests and ELF score. Currently, access to transient elastography is secondary care based. The preliminary data in this study shows that the ELF test is a good first line investigation for GPs suspecting NAFLD in a patient with type 2 diabetes and obesity or incident finding of fatty liver. It promotes the need to look beyond the routine liver panel test and identify the aetiology of liver disease and assess extent of liver fibrosis; in turn, to generate appropriate secondary care referrals and incorporate efficiency. Further assessment of the use of ELF in this setting continues.
intravenous drug and alcohol misuse have a high prevalence of HCV, are often sexually active with higher rates of transmission, have limited access to and/or engagement with HCV services, but often do attend community drug and alcohol services (CDAS). Our aims were to increase identification and treatment of patients with HCV by engaging these individuals within a community-based setting.

Methods Over one year (August 2015–2016), in partnership with five local CDAS we provided onsite nurse-led consultation, counselling, screening and risk stratification through non-invasive measurement of liver stiffness (fibroscan), dried blood spot screening (HBV/HCV/HIV serology, HCV RNA, T-spot), and referral to secondary care for initiation of approved DAA therapy and ongoing management of any concomitant chronic liver disease.

Results 174 CDAS service-users were screened and 123 (70%) were diagnosed as HCV RNA positive; 54% Genotype 3% and 46% Genotype 1. Median fibroscan score 7.1 Kpa, with 21 (12%) had a fibroscan Result suggestive of cirrhosis and were prioritised to treatment according to National guidance via our NHS-England HCV ODN.

To-date 86 (70%) pf the HCV positive patients have attended our clinic for consideration of access to DAA therapy.

Conclusions This community-based pilot had a significant rate of detection (70%), and excellent conversion to secondary care clinic review (70%). However, the majority of our patients had low levels of fibrosis and as NHS England policy over that period prioritised for patients with advanced disease, this cohort did not receive immediate access to treatment from the ODN over the time of the project, with Resultant disengagement by many from secondary care. Given recent changes in treatment access prioritisation we are now actively reengaging this group which represents an ongoing challenge.

Results Prior to a dedicated hepatologist all patients were followed up by general gastroenterologists. There was no dedicated variceal banding programme. There were up to 300 acute GI bleed endoscopies a year with approximately 10% due to AVB. Both hepatologists began performing weekly dedicated oesophageal variceal screening and treatment endoscopy lists (between 1–2/week). During period 1, there were 30 AVB; 27/30 (90%) received therapy, in the remaining 3, banding could not be applied due to poor views and injection therapy or sengstaken tube placement was performed. Of those presenting; 21/30 (70%) had previous OGD and banding but only 8/21 (38%) had previously been on banding program.

During period 2, there were 20 AVB; 19/20 (95%) received therapy. 12/20 (60%) had previous OGD and banding, and only 3/20 (15%) were on a dedicated banding programme.

Conclusions Prior to a dedicated hepatologist the vast majority of those presenting with AVB have a history of previous AVB and are potentially avoidable. With the advent of dedicated banding lists (as well as closer follow up with more robust secondary prophylaxis) there has been a major reduction of AVB presenting. There has been a shift of ‘new’ AVB unknown to the system rather than previous existing patients having undergone prior therapy. This has equated to a significant reduction in AVB of 30% during period 1% and 56% during period 2. Dedicated ‘surveillance’ lists such as for Barret’s have shown to reduce the incidence of late presentation of disease and we propose that dedicated varices surveillance and banding lists can reduce acute admissions.

Introduction Acute variceal bleeding (AVB) has historically accounted for up to 10% of all GI bleeds necessitating emergency out of hours endoscopy; These patients have a significantly poorer prognosis and higher re-bleed rate than non-variceal GI haemorrhage. In the last 3 years we have anecdotally noticed a significant reduction in AVB necessitating emergency endoscopy. This has coincided with the employment of dedicated hepatologists. We sought to quantify and quantify this reduction with the employment of one and then a second hepatologist at a university teaching hospital 18 months apart.

Methods This was a retrospective review identifying all AVB patients who underwent emergency endoscopy over a 3 year period between January 2015 and December 2017. Data was collected from the electronic database and the GI reporting tool. This included endoscopic findings, therapy performed and whether there was a previous history of AVB requiring endoscopy. A dedicated hepatologist was employed in January 2015 (period 1; 18 months) and a second hepatologist June 2016 (period 2; 18 months).

Results 25/101 patients were diagnosed on HCC surveillance; 11/101 presented with acute decompensated cirrhosis (9 were...
under a surveillance programme, 2 had failed to attend); 43/101 presented with symptoms and 22/101 were incidental findings. HCV was the predominant aetiology in those presenting symptomatically.

AFP was normal in half of all cases. Of those on surveillance, 63% had AFP measured prior to diagnosis and 8.5% had a raised AFP when initial imaging was normal. 57% patients were Child’s A, 38% Child’s B and 5% Child’s C at diagnosis.

Patients were more likely to have HCC diagnosed at an early stage on surveillance (68.6% vs 30.3%) and receive curative treatment (22.8% vs 12.1%) than the non-surveillance group. 1 and 3 year survival rates were greater on surveillance (67.7% vs 41.1% and 22.2% vs 8.16%, respectively). Median survival after diagnosis in the surveillance group was greater than those presenting for the first time.

Conclusions Surveillance was associated with earlier stage cancers and receipt of potentially curative treatment. However, patients known to secondary care made up a minority of HCC diagnoses. Improving identification and diagnosis of cirrhosis in primary care may therefore help identify at-risk patients earlier, although not all patients will engage with follow-up.

AFP measurement may identify additional cases of HCC that go undetected by USS, but should be weighed against potential patient harms from false-positive Results. Further studies should continue to inform an optimum HCC surveillance strategy.

**Introduction**

Survival estimates for different Barcelona Clinic Liver Cancer (BCLC) stages in hepatocellular carcinoma (HCC) contained in the EASL-EORTC Clinical Practice Guidelines rely on outcomes from randomised control trials and meta-analysis of pooled data. To identify areas for development to facilitate improvements in outcomes we aimed to provide an insight into HCC survival outcomes outside a clinical trials setting by presenting a large experience of patients referred with HCC to a regional hepatobiliary cancer centre in the UK.

**Methods**

All patients referred to the Hepatobiliary Cancer Multidisciplinary Team with a diagnosis of HCC over a two year period (January 2013 to December 2014) were included. Patients were stratified by their initial treatment modality according to the BCLC classification. Kaplan-Meier survival analysis was used to compare outcomes by initial treatment allocation.

**Results**

Among 356 patients (median age 66 years, 291 (82%) male), the most frequent underlying disease aetiologies were hepatitis C and alcohol-related liver disease. Overall survival at 3 years after diagnosis was 38% and 146 patients (41%) received treatment with curative intent. The 3 year survival for liver transplant was 84% (56 patients) and for resection it was 89% (46 patients). The median survival for radiofrequency ablation was 45 months (44 patients) and for transarterial chemoembolization (TACE) it was 18 months (72 patients). For patients receiving sorafenib as first-line therapy, the median survival was 9.6 months (12 patients) and for those receiving best supportive care (BSC) it was 3.4 months (126 patients).

**Conclusions**

These estimates of overall survival are consistent with those published in the EASL-EORTC Clinical Practice Guidelines and demonstrate that these figures give a reliable estimate of overall survival in a real-world experience. Over one third of patients were unsuitable for anti-cancer therapy at presentation and only a minority received treatment with curative intent. This highlights areas for potential improvement in outcomes particularly through early diagnosis of cirrhosis, facilitating treatment of the underlying cause of liver disease as well as the implementation of surveillance for HCC. Screening strategies for cirrhosis should be investigated to determine whether these can reduce overall mortality, including that from HCC.
N-ACETYLCYSTEINE AND PREDNISOLONE INCREASING AZATHIOPRINE DOSE WITH METABOLITE

Gut A122

Although biopsy has not yet been performed, abnormal 2-step true prevalence of significant fibrosis is likely to be greater. We only included those with proven steatosis and sufficient data to calculate NFS, therefore the true prevalence of significant fibrosis is likely to be greater. 

Conclusion NAFLD was common in the cohort, usually undiagnosed and frequently associated with abnormal NFS and Fibroscan despite normal LFT, suggesting there is a sizeable population in metabolic services with potentially significant liver disease. We feel a larger study to validate previous data and fully assess the effect of NAC in the treatment of AH on short term mortality is needed. 

Abstract PTH-092 Table 1 Mortality summary table of recent publications compared to the pilot data for this study

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<tbody>
<tr>
<td></td>
<td>266 patients</td>
<td>89 patients</td>
<td>85 patients</td>
<td></td>
</tr>
<tr>
<td>30 day</td>
<td>14%</td>
<td>24%</td>
<td>8%</td>
<td>20%</td>
</tr>
<tr>
<td>Mortality</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 months</td>
<td>30%</td>
<td>34%</td>
<td>22%</td>
<td>40%</td>
</tr>
<tr>
<td>Mortality</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 month</td>
<td>–</td>
<td>38%</td>
<td>27%</td>
<td>50%</td>
</tr>
<tr>
<td>Mortality</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12 month</td>
<td>57%</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Mortality</td>
<td></td>
<td></td>
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</tbody>
</table>

INTRODUCTION Severe Alcoholic Hepatitis (AH) (defined as a Maddrey score $>32$) is a life-threatening condition with a recently reported 1 month mortality of 14% and 1 year mortality of 57%. The current mainstay of treatment is corticosteroid therapy, but previous studies suggest adding N-acetylcysteine (NAC) improves short-term mortality. We assess the effect on mortality of NAC as additional treatment for severe AH.

METHODS We collected data using a standard proforma for patients admitted and diagnosed with severe AH (Maddrey score $>32$). Patients were treated with prednisolone (40 mg/day) and 5 days of IV NAC (at a dose of 150, 50, and 100 mg per kilogram of body weight in 250, 500, and 1000 ml of 5% glucose solution over a period of 30 mins, 4 hours, and 16 hours, respectively) and on days 2 through 5 (100 mg per kilogram per day in 1000 ml of 5% glucose solution). Patients were collected between 1st of May and 30th of October. We calculated the Lille score on day 7 of treatment and continued prednisolone in responders. Analysis was on a per-protocol basis. Mortality was assessed at 1, 3 and 6 months.

RESULTS 10 patients were included. Mortality is show in table 1 and compared to previous trials. The mean age of patients included was 51.6±11.06. Participants baseline characteristics were consistent with previous publications Maddrey score 61±27.9, Bilirubin 233.6±119.3, Prothrombin time (PT) 21.1+/−5.7. Over the six months, there were 4 episodes of infection (40%) and 0 episodes of hepatorenal syndrome. After treatment the mean Lille score was 0.433±0.31. Of those patients that died there was a significant difference compared to patients who survived in initial Maddrey score at 30 days (Alive: 53.4±23.2, Dead: 95.5±16.3 (p=0.041)) and at 6 months (Alive 38.6±16.1, Dead 83.4±15.4 (p=0.002)). There was no significant difference in Lille scores in patients that died at 1 or 6 months.

Conclusions Treatment with combination of NAC and corticosteroids demonstrated slightly worse outcomes compared with recent trials although our numbers are too small to be certain. This study suggests significantly elevated Maddrey scores are associated with an increased risk of mortality in severe AH. We feel a larger study to validate previous data and fully assess the effect of NAC in the treatment of AH on short term mortality is needed.

Abstract PTH-093 INCREASING AZATHIOPRINE DOSE WITH METABOLITE MONITORING IN AIH

1Laura Harrison*, 1Elaine McFarlane, 1Asha Dube, 1Dermot Gikeson, 1Sheffield Teaching Hospital’s NHS Foundation Trust, Sheffield, UK; 2University of Sheffield, Sheffield, UK

Introduction Initial treatment of AIH, involves prednisolone plus azathioprine (AZA) 1 mg/kg/day. Blood levels of active AZA 6-thioguanine (6-TGN) and 6-methyl mercaptopurine (6-MMP) metabolites are determined by activity of thiopurine methyl transferase (TPMT). High metabolite levels are associated with efficacy (6-TGN) and toxicity (6-TGN and 6-MMP) (Dhaliwal Hepatology, 2012. 56:1401–8).

Aim To see if AZA metabolite monitoring could optimise AZA dose and improve histological remission rates.

METHODS In 26 patients with AIH (1999 International Group Criteria, presenting 2013–2016), we aimed to increase AZA dose from 1 to 2 mg/kg after 3 months, with metabolite monitoring, to achieve 6-TGN levels between 250–500 pmol/8×108 RBCs and 6-MMP levels<5000 pmol/8×10⁸ RBCs. 13 patients underwent repeat liver biopsy after two years treatment.

RESULTS 5 patients did not achieve a dose of 2 mg/kg/day AZA (raised 6-TGN (n=3), nausea (n=1), metabolites in target range on lower dose (n=1)). In 15 of the other 21 patients, AZA was initially increased to 2 mg/kg/day but had been reduced by the end of follow-up, with corresponding rises and then falls in 6-TGN and 6-MMP land in mean cell volume (MCV) (table 1). Reasons for dose reduction included: metabolite levels above target range (6-MMP: n=4, 6-TGN:
Abstracts

n=4, both: n=1), nausea (n=3), malignancy (n=1) and leucopenia (n=1). In 4 patients who developed nausea on AZA, 6-TGN levels were (601, 4.3 528 and 434). No patients developed hepatotoxicity.

Serum ALT normalised in 23 and 25 patients within 6 and 12 months respectively. However, only 7 out of 13 patients who had follow up biopsy achieved histological remission (similar to our previous experience (Dhaliwal, Am J Gastroenterol, 2015; 110:993–99)). 6-TGN levels did not differ between those who did and did not attain remission (median 345 v 275; p=0.295).

Results

<table>
<thead>
<tr>
<th>Abstract PTH094 Table 1</th>
<th>Switched to MMF due to AZA intolerance (23)</th>
<th>AZA continued/changed due to unresponsiveness (196)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men (number (%))</td>
<td>3 (13%)</td>
<td>39 (20%)</td>
<td>0.401</td>
</tr>
<tr>
<td>Age at diagnosis*</td>
<td>63 (19.4–80.4)</td>
<td>57 (2.5–85.2)</td>
<td>0.089</td>
</tr>
<tr>
<td>Follow-up (years)*</td>
<td>4.0 (1.0–17)</td>
<td>9.8 (0.5–29)</td>
<td>0.110</td>
</tr>
<tr>
<td>Presentation:</td>
<td>4/22</td>
<td>60/192</td>
<td>0.858</td>
</tr>
<tr>
<td>cirrhosis</td>
<td>2 (9%)</td>
<td>26/193 (13.5%)</td>
<td>0.383</td>
</tr>
<tr>
<td>decompensation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Serum ALT normal</td>
<td>21/22 (95%)</td>
<td>179/185 (96%)</td>
<td>0.095</td>
</tr>
<tr>
<td>by 1 year</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biopsy 1: Necro-</td>
<td>10 (2–16) n=23</td>
<td>12 (1–18) n=173</td>
<td>0.376</td>
</tr>
<tr>
<td>inflammatory</td>
<td>2 (1–6) n=23</td>
<td>3 (0–6) n=148</td>
<td>0.235</td>
</tr>
<tr>
<td>(NI) score*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fibrosis stage*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biopsy 2: NI score*</td>
<td>4 (0–12) n=18</td>
<td>4 (0–14) n=122</td>
<td>0.327</td>
</tr>
<tr>
<td>Fibrosis stage*</td>
<td>2.5 (0–9) n=18</td>
<td>3 (0–6) n=120</td>
<td>0.190</td>
</tr>
<tr>
<td>% Histological remission on F.U. biopsy</td>
<td>91/8 (50%)</td>
<td>85/178 (48%)</td>
<td>0.746</td>
</tr>
<tr>
<td>All-cause death/</td>
<td>9%±9%</td>
<td>14%±2%; ns.</td>
<td></td>
</tr>
<tr>
<td>transplant: 5 year</td>
<td>9%±9%</td>
<td>25%±3%; ns.</td>
<td></td>
</tr>
<tr>
<td>10 year</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Liver death/</td>
<td>0%</td>
<td>7%±2%; ns.</td>
<td></td>
</tr>
<tr>
<td>transplant: 5 year</td>
<td>0%</td>
<td>11%±2%; ns.</td>
<td></td>
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<tr>
<td>10 year</td>
<td></td>
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</table>

*p=0.002 and p=0.004 vs. initial dose.
+*++p=0.002, 0.004 and 0.110 respectively vs. after dose increase

Conclusions Increasing AZA dose from 1 to 2 mg/kg/day after 3 months, with metabolite monitoring was (a) limited by high metabolite levels and side effects and (b) did not Result in higher rates of remission, compared to standard therapy.

**PTH-094 ROLE OF MYCOPHENOLATE MOFETIL (MMF) IN PATIENTS SWITCHING FROM AZATHIOPRINE DUE TO INTOLERANCE IN AIH**

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Sheffield Teaching Hospital’s NHS Foundation Trust, Sheffield, UK

10.1136/gutjnl-2018-BSGAbstracts.245

Introduction Mycophenolate mofetil (MMF) is an alternative steroid-sparing agent in patients with AIH who either respond inadequately to, or are intolerant of azathioprine (AZA). Short-term Results seem better in AZA intolerant than in AZA sub-responsive patients (Hennes 2008 Am. J Gastro. 103:3063, Sharzehi 2010 Can. J. Gastro. 24: 588). There are few data regarding histological response and longer-term outcome in patients switched to MMF.

Methods Study of consecutively recruited patients with AIH (1999 International Group Criteria) managed 1987–2016. Patients also received prednisolone and were followed for >6 months from diagnosis. Results in AZA intolerant patients who switched to MMF within 6 months (23) were compared to those who continued AZA (196), including those who switched to alternative immunosuppression (including MMF) due to AZA unresponsiveness but not intolerance.

**PTH-095 MINIMISING NON-HEPATIC COMPLICATIONS FOLLOWING LIVER TRANSPLANT: EVALUATION OF PRACTICE FROM A SINGLE REFERRAL CENTRE**

James Hawken, Ben Hudson, Talal Valliani. North Bristol NHS Trust, Bristol, UK

10.1136/gutjnl-2018-BSGAbstracts.246
Introduction Non-hepatic complications of liver transplant are common and associated with significant morbidity and mortality. The American Association for the Study of Liver Diseases (AASLD) practice guideline on the long-term management of liver transplant recipients aims to assist with modifying the risk of these complications. There is currently no equivalent European guideline. We analysed clinical records from a large UK centre to ascertain whether post-transplant care was comparable to the AASLD standards of care.

Methods Consecutive patients who had been transplanted at two UK centres following referral from a single UK centre between 1988 and 2016 were analysed retrospectively. All clinical documentation and test Results over a 12 month period were analysed. Outcome measures were aligned with AASLD guidelines, including; screening for diabetes, chronic kidney disease, hypertension, dyslipidaemia and osteopenia.

Results 48 patients (29 female/19 male) were included in analysis. Mean age was 57 (SD 13.4). Median time since transplantation was six years (IQR 3–13). 10/17 (58.8%) diabetic patients met the recommendation of having their HbA1c measured in the preceding 3 months. Of non-diabetic patients, 15/29 (51.7%) underwent annual fasting glucose (or HbA1c) during the study period. 48/48 (100%) of patients had evidence of renal function monitoring within the last 12 months. Yearly urine albumin-creatinine ratio testing was performed in 10/48 (20.8%). Blood pressure was measured in 13/48 (27%) of patients. Of those, 7/13 (53.8%) had a satisfactory blood pressure of <130/80 mmHg. The recommendation of annual blood lipid measurement took place in 30/48 (62.5%) and annual Vitamin D in 20/48 (41.7%). 8/18 (44.4%) of patients transplanted between 2005 and 2012 underwent a Dual Energy X-ray Absorptiometry (DEXA) scan within 5 years. 12/14 (85.7%) of osteopenic patients were receiving the recommended calcium supplementation, while 2/14 (14.3%) of them were receiving annual Bone Mineral Density testing.

Conclusion Liver transplant recipients in this study did not receive a consistent approach to screening for common non-hepatic complications. Although there was often evidence that these complications were appropriately considered, there was wide variability between patients. The level of monitoring for patients, who are high risk for cardiovascular and metabolic disease, was insufficient overall. Consideration should be made to adoption of models of care which provide standardised recommendations for patients in the post-transplant phase. This may lead to a more rigorous and robust approach to patients’ long-term management, which in turn may reduce late morbidity and mortality.

NAFLD

ANTIBIOTIC USE IN PRIMARY AND SECONDARY PROPHYLAXIS OF SPONTANEOUS BACTERIAL PERITONITIS FOR LIVER CIRRHOSIS PATIENTS

Arif Hussenbux, Lysander Gourbault, Victoria Blackwell, John Ryan, Jane Collier. John Radcliffe Hospital, Oxford, UK

10.1136/gutjnl-2018-BSGAbstracts.247

Introduction Spontaneous Bacterial Peritonitis (SBP) is associated with 30%–50% mortality within 1 year and 70% chance of recurrence. EASL guidelines state prophylactic antibiotics should be given to patients with proven SBP (secondary prophylaxis) and patients with low total protein count (<15 g/L) in ascitic fluid with no prior history of SBP (primary prophylaxis). We audited whether these guidelines were followed and the associated mortality risk.

Methods Data on all ascitic taps for patients with confirmed liver cirrhosis were collected retrospectively over a 12 month period.

SBP patients were assessed as to whether secondary prophylactic antibiotics were commenced. The same investigations were carried for bacterascites (BA) patients, including whether BA was treated. Previous ascitic taps were analysed for low total protein count (<15 g/L).

Cirrhotic patients without SBP or BA had their ascitic total protein count measured. If less than 15 g/L we assessed whether primary prophylactic antibiotics were started. We assessed mortality rate for all patients.

Results Data collection period was from 15/10/2016 to 15/10/2017 yielding 860 ascitic taps. Of the 89 patients with liver cirrhosis; infection was identified in 33 patients; 16 patients with SBP and 17 patients with BA.

- Gram negative organisms were identified in 4/7 with SBP and 7/17 with bacterascites.
- Secondary prophylaxis was started in 10 of 16 (62.5%) patients with SBP. Of the patients where secondary prophylaxis was not started 3 of 6 (50%) died within 12 months. All 16 patients had a previous tap within 12 months (mean 3.4 months) with ascitic protein count less than 15 g/L. Primary prophylaxis was not started for any patients.
- 10 of 17 (58%) BA patients received intravenous antibiotic treatment. From this group 6 of 10 (60%) received secondary prophylaxis. 6 of 17 (35%) patients died within 12 months and none of these patient commenced secondary prophylaxis. All 17 patients had a previous tap within 12 months (mean 4.2 month) with ascitic protein count less than 15 g/L.
- Of the 56 patients without SBP or BA 33 (58.9%) had an ascitic protein count of less than 15 g/L. No patients were started on primary prophylactic antibiotics. 6 of 33 (18.1%) patients with low protein ascites subsequently developed SBP when reviewed prospectively. No patients with ascitic protein count greater than 15 g/L have developed SBP or BA. 16 of 33 (48.4%) patients with low protein ascites died over the next 12 months.

Conclusion 66 of 89 (74%) patients had low protein ascites and 50% (33 of 66) subsequently developed either SBP or BA within 12 months. This highlights the importance of primary prophylactic antibiotics for patients with low protein ascites in the prevention of SBP and BA.
Fib4 scores, in order to assess the likely cost implications of such screening in the community.

**Methods**

76 successive patients attending their GP practice for routine diabetic review had a Fib4 score calculated. Those who had Fib4 score above defined age-related cut-offs (1.35 for <65 year olds, >2.00 for 65–80 year olds and >3.25 in over 80 year olds) were referred to secondary care for further evaluation (including fibroscan or liver biopsy). We looked at referral rates in order to extrapolate the number of likely referrals to secondary care and cost implications if this approach was rolled out across the local area.

**Results**

76 successive patients were screened with Fib4 scores at diabetic review. 18 (23%) were female and 58 (77%) male, age 31–93 (mean age 64 yo) with a mean BMI of 31.08. Alcohol consumption ranged from 0–40 units with a mean of 5.4 units per week. Of 76 patients, 10 (13.15%) were found to have scores above the age related cut-off (mean age 69.8). None of these had previously been referred to secondary care. Of these, 8/10 (80%) had an ALT within ‘normal’ range and 4 (40%) had an ALT of <20, 4/10 (40%) were thrombocytopenic (plt <150) and 8/10 (80%) had plt count <200. 6 of the 8 (75%) patients with raised ALT (>40) in the cohort had a Fib4 score below the age related cut-off, 5 were unsuitable for referral because of significant co-morbidities or inability to consent. 5/76 (6.57%) were referred to secondary care for consideration of Fibroscan/liver biopsy.

**Conclusions**

This initial pilot confirms that abnormal liver function tests do not correlate well with fibrosis scores, and diagnosis of NAFLD based on abnormal liver function tests are likely to miss patients with advanced fibrosis. Based on this initial pilot, the referral rate for Type 2 diabetics following Fib4 screening would be 6.57%. In our local area, with an estimated 10 000 patients with T2DM, this would generate an estimated 657 referrals. These patients would require ultrasound scans, secondary liver screens and fibroscan and/or liver biopsy to stage disease, and there would then be additional costs associated with surveillance of patients who are found to have advanced fibrosis or cirrhosis. The next step is to assess the referrals via the pathway with Fibroscan/liver biopsy, to determine the proportion with advanced liver disease.

**PTH-098** **CAN BAVENO-VI CRITERIA FOR VARICES SCREENING SAFELY REDUCE ENDOSCOPY WORKLOAD IN A REGIONAL LIVER UNIT?**

Hannah McDowell, Kenneth Tang, Johnny Cash, Roger McCorry, Ian Cadden, Neil McDougall. Royal Victoria Hospital, Belfast, UK

10.1136/gutjnl-2018-BSGAbstracts.249

**Introduction**

Oesophageal varices (OV) are a common sequelae of liver cirrhosis often leading to significant morbidity and mortality. Traditionally, patients with liver cirrhosis have undergone variceal surveillance by means of oesophago-gastro-duodenoscopy (OGD). The Baveno VI guidance proposes that of those with a platelet count of greater than 150×10⁹/L and transient elastography (Fibroscan) reading of <20 kPa have a very low risk of having OV requiring treatment and can subsequently avoid screening OGD. We sought to apply these criteria to the annual screening workload of a regional liver unit to assess what proportion of screening OGDs could be safely avoided.

**Methods**

A retrospective analysis was carried out of all OGDs performed for assessment of oesophageal or gastric varices by the hepatology department in a 12 month period (2016) in the Regional Liver Unit, Royal Victoria Hospital, Belfast. Data was retrieved from the endoscopy unit database (Unisoft) and patient information was obtained using the regional Electronic Care Record. Exclusion criteria included pre-hepatic or presinusoidal portal hypertension (n=14), previous banding or glue therapy (n=166), TIPS (n=6), emergency endoscopy for acute bleeds (n=51) and Childs C liver disease (n=7). Transient elastography (TE) and platelet count (performed within a year of endoscopy) were assessed alongside OGD Result.

**Results**

Of the 509 OGDs carried out in 2016, 244 were excluded due to the above criteria, leaving 265 who had OGD for varices screening. 183 (69%) of the 265 screened patients had not undergone TE due to being diagnosed with cirrhosis radiologically or histologically. This left 82 valid subjects who could be assessed by Baveno VI criteria. 24 (29%) of the valid subjects fulfilled the Baveno VI criteria to avoid screening, 20 of whom had no OV whilst the remaining 4 had 1 column of ‘barely noticeable’ or ‘possible’ OV. None of the patients required a therapeutic intervention. 59 subjects had either platelet count of <150 or TE scores of >20 kPa and therefore, by Baveno VI guidance should undergo screening endoscopy. Of these, 35 did not have OV and 24 (40.1%) had OV including 11 who required a drug intervention with beta blocker.

**Conclusions**

At least 10% (24 of 244) of those undergoing OGD screening for varices in a regional liver unit could safely avoid OGD if Baveno VI criteria were applied. This number could be significantly higher if TE was used to assess every patient before screening. 69% of those who had screening OGD in our unit did not have TE and therefore could not have Baveno VI criteria applied.

**PTH-099** **THE PREDICTIVE VALIDITY OF INDICES OF FUNCTIONAL DECLINE IN DETERMINING OUTCOME FOLLOWING LIVER TRANSPLANTATION**

1Priya Dhar*, 1Lynda Greenslade, 2Rachel Westbrooke, 2Clive Jackson, 2Aileen Marshall, 1Marsha Morgan. 1UCL Institute for Liver and Digestive Health, University College London, London, UK; 2The Sheila Sherlock Liver Centre, Royal Free Hospital, London, UK; 3The Department of Neurophysiology, Royal Free Hospital, London, UK

10.1136/gutjnl-2018-BSGAbstracts.250

**Introduction**

Disease severity, disease aetiology and nutritional status are important determinants of outcome in patients with cirrhosis. Functional decline, reflected by health-related quality of life (HRQOL), mental health, and degrees of disability and frailty may also play an important role. However, it is unclear whether these factors influence outcome after liver transplantation. This study aimed to assess the predictive validity of indices of functional decline in determining transplantation outcome in patients with cirrhosis.

**Methods**

Twenty-eight consecutive patients (mean [range] age 52 [29–66] yr; 75% men; four (14.3%) alcohol-related; mean MELD 13.2 [7–30]) transplanted for end stage liver disease/ HCC were included. All were assessed pre-transplantation, as follows: disease severity: MELD and Child Pugh (CP); nutritional status: The Royal Free Hospital-Nutritional Prioritising Tool; HRQOL: Chronic Liver Disease Questionnaire and Euro Qol-5 Dimension Tool; mental health: Beck Anxiety and Depression Indices; disability: Activities (ADL) and

Gut 2018;X(Suppl X):A1–A284 A125
Independent Activities of Daily Living (IADL); and frailty: Clinical Frailty Scale, Short Physical Performance Battery and Fried Frailty Criteria plus two composite instruments, the Bristol Prognostic Index and Karnofsky Age MELD Model. Variables associated with the primary outcome (death/ retransplantation) were identified using Cox regression analysis. Variables associated with secondary outcomes, including the total units of blood transfused and the length of hospital stay, were identified using linear regression analysis.

**Results**

Patients were followed for a mean of 143 [3–326] days; two (7.1%) died and four (14.3%) were retransplanted. IADL was the only tool significantly associated with mortality in this cohort. Each unit increase in the IADL (decreasing frailty) was associated with a 45% decrease in mortality after adjustment for MELD (Hazard Ratio (HR) 0.55, 95% CI, 0.33–0.92). The total mean LOHS was 28 [7–112] days. The CP score was significantly associated with LOHS (F(1, 25) = 6.01, p=0.02, R²=0.19); each unit increase in CP was associated with an increase in LOHS of 6.5 days. The mean units adjustment for MELD (Hazard Ratio (HR) 0.55, 95% CI, 0.33–0.92) was log 5.81 IU/mL (range: log2.16 to log7.42 IU/mL).

**Conclusions**

Disease severity and functional decline, characterised with the IADL score are significantly associated with short to medium term transplant outcomes in this cohort. Longer-term follow is required to validate these Results.

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**Abstracts**

**PTH-100**

**HEPATITIS C IN AN INNER CITY HUB: REAL LIFE RESULTS**

Juhee Pahuja, Susanne Johansen, Sam Douthwaite, Ranjibabu Kalaseagaram, Philip Berry, Terence Wong. Guy’s and St Thomas’ Healthcare NHS Trust, London, UK

10.1136/gutjnl-2018-BSGAbstracts.251

**Introduction**

Around 2 00 000 people in the UK are infected with Hepatitis C (HCV). Recent advances in direct-acting antiviral (DAAs) agents have revolutionised treatment of HCV with all oral regimens showing high cure rates. Registry studies of DAAs have reported sustained virologic response (SVR) rates of >95%. This study examines real life SVR rates outside of clinical studies in an inner city area.

**Methods**

250 eligible patients with chronic HCV were treated with DAAs from 10/09/2015 to 27/07/2017. After assigning to them to specific DAA combination therapy dependent on their genotype (GT), the hepatitis C RNA was measured 12 weeks after the cessation of therapy, with a SVR defined as an undocumented viral load (Roche ampicor, lower limit of detection 15iu/ml). We analysed the SVR12 according to genotype, treatment naïve versus previously treated patients, and specific DAA treatment combinations.

The mean age was 52 year (27 yr-84yr). 74% (185/250) were male. 188/250 (75%) patients were Caucasian. 5%, 68% and 27% of the patients had a Fibroscan liver stiffness measurement (LSM) of <9.5 kPa, 9.5 kPa-11.5 kPa and >11.5 kPa, respectively (mean LSM 10 kPa). 91/250 (39%) patients were HIV co-infected. There were 186 (74%), 8 (3%), 23 (9%), 32 (13%) and 1 (0.4%) patients with HCV GT1, GT2, GT3, GT4 and GT5, respectively. The mean HCV RNA viral load was log 5.81 IU/mL (range:log2.16 to log7.42 IU/mL).

**Results**

94% (234/250) patients of the 250 HCV infected patients achieved SVR12. Across the specific treatment combinations +/-Ribavirin, 100% of 14 patients on Sofosbuvir and Velpatasvir, 96% of 79 patients on Sofosbuvir and Ledipasvir, 91% of 11 patients on Sofosbuvir and Daclatasvir, 86% of 7 patients on Sofosbuvir, 95% of 37 patients on Elbasvir and Grazoprevir, 93% of 85 patients Ombitasvir, Paritaprevir, Ritonavir and Dasabuvir, 88% of 17 patients on Ombitasvir, Paritaprevir and Ritonavir achieved SVR12.

94% of 175 GT1 patients, 88% of 7 GT2 patients, 96% of 22 GT3 patients, 91% of 29 GT4 patients and the 1 GT5 patient achieved SVR12. Overall, 92 patients had previous treatment with 92% achieving SVR12. Out of the 158 treatment naïve patients, 95% achieved SVR12.

There were 16 treatment failures overall; 1 due to poor treatment compliance and 6 responding, with relapse. 5 were lost in follow up with 1 patient achieving SVR4 and 1 with an end-dose response but subsequently both were lost in follow up. 1 patient discontinued due to acute cholecystitis and 2 patients died during the treatment period. 1 patient died after achieving SVR12.

**Conclusions** Our Results indicate DAA therapy is highly effective with real life SVR rates comparable to the registry studies, paving the way for HCV eradication in the UK.

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**ALPPS**

**PTH-101**

**TECHNIQUE TO MINIMISE SMALL FOR SIZE SYNDROME TO TUMOUR METASTASES AFTER MAJOR HEPATECTOMY FOR NEUROENDOCRINE**

1Michail Pizanias, 2Michail Papamichal, 1Elissaisos Kontis, 1Evangelos Prassas, 1John Ramage, 1Parthi Sriwisan, 2Rajawathen Sirajiskanthan, 1Andreas Prachalias. 1King’s College Hospital, London, UK; 2Department of Organ Transplantation and Hepato-Pancreato- Biliary Surgery, Lahey Hospital and Medical Center, Boston, USA

10.1136/gutjnl-2018-BSGAbstracts.252

**Introduction**

Hepatic resection has emerged as an effective treatment for secondary liver neuroendocrine tumours. Associated liver partition and portal vein ligation for staged hepatectomy (ALPPS) allows resection of liver tumours in two steps. We present our experience in ALPPS procedure as a Method which can minimise small for size syndrome, and provide an oncological benefit to borderline resectable neuroendocrine tumours within acceptable safety profile.

**Methods**

4 patients (male: female: 1:1) underwent ALPPS procedure for clearance of the metastatic liver disease. Liver segments I, IV-VIII were resected for each patient. Two of the patients had bi-lobar disease. Clearance to future liver remnant (FLR) was achieved with non-anatomical liver resection in one case and with irreversible electroporation to the other as the lesion was adjacent to the left hepatic vein during the 1st stage of the ALPPS procedure. Two patients underwent ALPPS as a salvage procedure after failed portal vein embolization and portal vein ligation respectively.

**Results**

Median increase of FLR volume was 139.25% (range 157.78%). Median hospital stay was 28.5 days (range 23–36). Histology report revealed two complete (R0) and two incomplete (R1) resections. Background liver histology revealed steatosis on two occasions and fibrosis on another. 90 day mortality was zero. Two patients developed grade II complications as per Clavien-Dindo classification, one grade IIIa and one IIIb. One patient is disease free after 36 months. One
CIRRHOTIC PATIENTS WITH VITAMIN D DEFICIENCY FAIL TO RESPOND TO ORAL REPLACEMENT THERAPY

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10.1136/gutjnl-2018-BSGAbstracts.253

Introduction Vitamin D deficiency and reduced BMD are highly prevalent in patients with advanced chronic liver disease. For bisphosphonate treatment for osteoporosis to be effective, vitamin D levels must be replete. Moreover, vitamin D deficiency has been associated with an increased risk of infections and increased rejection rates following liver transplantation. The optimal dose and route of vitamin D replacement in cirrhosis is unknown. BSG guidance currently recommends 800 IU/day orally for all patients with cirrhosis/cholestatic liver disease.

Methods Retrospective review of 218 cirrhotic patients undergoing evaluation for liver transplant between 2016 and 2017. Vitamin D ‘severe deficiency’ was defined as <25 ng/ml, ‘deficiency’ 25–50 ng/ml and normal >50 ng/ml. Response to oral vitamin D therapy was recorded.

Results Out of 218 patients, 128/218 (59%) had low Vitamin D levels with 25% (n=55) ‘severely deficient’ and 33% (n=73) ‘deficient’. Overall 33 patients with levels<50 ng/ml (52%), and 31 patients (48%) with levels>50 ng/ml received replacement therapy. (p=0.86).

Median daily dose of Vitamin D replacement was 2800 units/day (IQR 800–2800) in <25 ng/ml group, 2860 units/day (IQR 800–2800) in <50 ng/ml group and 800 units/day (IQR 800–2000) in >50 ng/ml group. No significant difference in dosing between these groups (p=0.12).

Data on vitamin D levels pre and post 3 months of treatment with Vitamin D therapy were available in 58 patients. Patients received either 400IU/day (n=6), 800–1600IU/day (n=28) or >1600 IU/Day (n=24). Median delta change in vitamins D levels in the 3 groups were −3 ng/ml, −1 ng/ml and 12 ng/ml over the 3 month treatment period. An average daily dose of >1600 IU/day Resulted in a significantly greater increase in Vitamin D levels when compared to doses<1600 IU/day (p=0.01), albeit still sub optimal with only a median increase of 12 ng/ml.

When those patients with Vitamin D levels of <50 ng/ml were reviewed in isolation (n=29), 82% failed to augment vitamin D levels to within the normal range >50 ng/dl and no significant difference was found between dosages of vitamin D administered.

Conclusion Vitamin D deficiency is prevalent, affecting over 50% of patients with advanced cirrhosis. Oral vitamin D replacement therapy is ineffective in cirrhotics at repleting stores over a 3 month period irrespective of dose given.

Future evaluation of efficacy of IM administration in this unique cohort of patients is urgently needed to evaluate if this allows normalisation of Vitamin D levels.

EPIDEMIOLOGY OF VITAMIN D DEFICIENCY AND BONE MINERAL DENSITY IN PATIENTS WITH CHRONIC LIVER DISEASE

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10.1136/gutjnl-2018-BSGAbstracts.254

Introduction Patients with chronic liver disease have increased risk of bone disease (BD) with reported prevalence of osteoporosis (OP) between 12%–53% and a high prevalence of Vitamin D deficiency. The aetiology is poorly understood with a complex interplay between endocrine, metabolic, nutritional and physical abnormalities. We aim to evaluate the influence of epidemiological parameters on bone mineral density and vitamin D levels in cirrhotics.

Methods Retrospective study of cirrhotic patients from 2016–2017. Data were collected on aetiology of cirrhosis, severity (UKELD/MELD score), bone mineral density (BMD), vitamin D, body mass index (BMI) and hand grip strength. OP was defined as per WHO classification and Vitamin D deficiency as a Vitamin D level <50 nmol/L with severe deficiency <25 nmol/L.

Results 248 patients were included, 180 male, 58 female, median age 57 years (IQR 49–63) and median BMI of 27. Underlying aetiology was ALD (n=78), Viral (n=56), PBC/PSC (n=46), NAFLD (n=23) and AIH (n=18). Median UKELD and MELD scores overall were 53 (IQR 49–57) and 14 (IQR 10–19). At the time of evaluation 141 (56.8%) patients were either osteoporotic (n=52) or osteopenic (n=99). The prevalence of BD was significantly higher in cholestatic diseases (71.7%, mean T score −1.86 +/-1.22) and lower in NAFLD (37%, mean T score −0.45 +/-1.50) when compared to other aetiologies (ANOVA p=0.0005). 120 (55.4%) patients were vitamin D deficient with 51 (25%) patients having severe deficiency. Mean vitamin D level was highest in cholestatic disease (75.5 ng/ml +/59.6) when compared to other aetiologies (ANOVA p=0.003).

Liver severity scores (UKELD/MELD respectively) did not correlate with the presence of BD (p=0.32/p=0.53) but patients with higher MELD scores had lower vitamin D levels (p=0.04). Reduced BMI correlated with the presence of BD (p<0.01) but not vitamin D level. Increased Hand Grip Strength (HGS) was associated with higher vitamin D levels (p=0.049) and higher lumbar T scores (p=0.014). Vitamin D levels did not correlate with BMI (p=0.77).

Conclusion Bone disease and vitamin D deficiency are prevalent in patients with cirrhosis, with cholestatic aetiologies having the highest prevalence of OP and NAFLD the lowest. Interestingly disease severity does not correlate with BD whereas more functional markers of frailty such as HGS appear to positively correlate. Increased disease severity (MELD) significantly correlates with decreasing vitamin D levels, which raises the question of whether vitamin D could be impacting on progression of cirrhosis, or vice versa. Further prospective research is needed to look at the role of vitamin D in cirrhosis.
Introduction In Scotland 65% of adults are overweight and 29% obese. Among the health implications is a rising prevalence of diabetes within the population. Diabetes is known to contribute to liver damage, including carcinogenesis, and this study seeks to establish the impact of this damage on liver disease, hepatocellular carcinoma (HCC) and need for transplantation within Scotland. Diabetes, as a major risk factor for non-alcoholic fatty liver disease (NAFLD) could also be considered a surrogate marker for the NAFLD component of liver damage in other primary aetiologies.

Methods Prospectively held patient data from all transplant assessments undertaken at the Scottish liver transplant unit (SLTU) since 1992 were retrospectively analysed for the assessments undertaken at the Scottish liver transplant unit (SLTU) since 1992 were retrospectively analysed for the presence of diabetes, HCC and the underlying aetiology of their liver disease. Data were collected through VitalData (©Vital-pulse Ltd) and exported into Microsoft Excel (©Microsoft) for analysis.

Results In 1993 there were 45 assessments, which rose to 214 assessments in 2015, giving a total of 3098 during this time frame (Abstract PTH104 figure 1).

The incidence of diabetes in patients referred for liver transplant remained persistently below 5% until 2004, from which point it started to increase to 24% in 2016 (Abstract PTH104 figure 2).

Figure 3 shows the percentages of patients who are referred for transplant assessment with HCC who were diabetic at the time of referral.

12.0% of the 3098 patients referred had diabetes, this varied depending on their underlying aetiology: NAFLD (41.9%), ALD (13.5%), cryptogenic cirrhosis (9.6%), HCV (9.2%) and PBC (2.6%). The percentage of patients with diabetes and HCC referred was 18.5% (of 574 patients): NAFLD (45.7%), haemochromatosis (37.2%), ALD (19.1%), PSC (16.7%), HBV (12.5%), HCV (9.9%) and others (0%) (figure 4).

Conclusions The number of assessments has been increasing since the beginning of transplantation at the SLTU in 1992 with an increasing proportion diabetic. The impact is most clear through the trend in NAFLD reaching transplantation but the prevalence in other aetiologies of liver damage suggests a compound effect.

With the exception of PBC, each of the most common aetiologies shown a higher prevalence of diabetes in the patients referred with HCC. This suggests that diabetes promotes carcinogenesis, with the more modest impact in HCV mirroring previous studies into the carcinogenicity of diabetes.

The increasing incidence of diabetes in patients being referred for transplant assessment with decompensated liver disease or HCC suggests that the national burden of diabetes and NAFLD will contribute to an increasing burden of liver damage of almost any aetiology.
PLASMA S100A8/A9: A NOVEL MECHANISTIC BIOMARKER IN INNATE IMMUNE ACTIVATION IN ACUTE-ON-CHRONIC LIVER FAILURE

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Introduction Acute-on-chronic liver failure (ACLF) is driven by systemic inflammation but lacks reliable diagnostic or prognostic biomarkers. Circulating S100A8/A9 heterodimer (calprotectin) is secreted by activated myeloid cells to activate and propagate innate immune responses and organ dysfunction. This study aims to evaluate circulating levels of S100A8/A9 in ACLF and determine its effect on myeloid cell function.

Methods Plasma S100A8/A9 concentration of 92 patients at admission was analysed using enzyme-linked immunosorbent assay (ELISA) in ACLF (n=62), cirrhosis without organ failure (n=28) and healthy control (n=30) groups. Baseline plasma cytokines were measured by multiplex immunoassay. Indices of disease severity and survival was evaluated with Kaplan Meier analysis. Phenotype (CD11b, HLA-DR, Mer tyrosine kinase [MerTK], CD163 and CD206) of healthy CD14+ monocytes cultured with S100A8/A9 in vitro for 24 hours at 0, 1000 and 2500 ng/ml was assessed using flow cytometry (n=6).

Results Admission plasma S100A8/A9 was higher in ACLF (median 2000 ng/ml) compared with cirrhosis without organ failure (934.8 ng/ml p=0.007) and healthy control (963 ng/ml p=0.003) (figure 1). S100A8/A9 was higher in patients with systemic inflammatory response syndrome (SIRS) (n=28, p=0.045) and non-survivors (p=0.01). Baseline interleukin-1 (IL-1) was elevated in ACLF compared to healthy (0.07 vs. 0.36 pg/ml p=0.009), correlating with S100A8/A9 concentration (r=0.508 p=0.01). Area under the receiver operating characteristic curve (AUROC) for S100A8/A9 to detect the presence of ACLF was 0.681 (p=0.009). For 90 day mortality in ACLF, AUROC was 0.694 (p=0.014) but highest for the CLIF-ACLF score (0.767, p=0.001). S100A8/A9>1406 ng/ml (sensitivity 0.73 specificity 0.61) was associated with decreased transplant-free survival (log rank p=0.02) (figure 2). S100A8/A9 predicted 90 day mortality (p=0.018) on univariate analysis, remaining significant in a multivariate logistic regression model (OR 1.0 p=0.04). In flow cytometric analysis, activated CD11b+HLA-DR+MerTK+ myeloid cells (%) significantly increased (p=0.01, Friedman’s ANOVA) as S100A8/A9 concentration increased from 1000 to 2500 ng/ml with a trend to reduction in CD206 (p=0.13) (figure 3).

Conclusions Plasma S100A8/A9 is significantly elevated in ACLF, correlating strongly with activation of pro-inflammatory mediators and indices of disease severity, extra-hepatic organ failure and outcome. Our in vitro data indicate that this mediator promotes inflammation and represents a novel therapeutic target in ACLF.
Abstractions

**PTH-107** **CORRELATION BETWEEN NON-INVASIVE TESTS AND DIFFERENT STAGES OF LIVER FIBROSIS IN PATIENTS WITH NAFLD**

W Siu, I Ko, W Taj-Aldeen, A Mukhopadhya. Department of Digestive Disorders, Aberdeen Royal Infirmary, Aberdeen, UK

*Abstract* 905 patients with NAFLD underwent Fibroscan at Aberdeen Royal Infirmary from March 2013 to November 2016. 417 patients with liver stiffness measurement >7 kPa underwent electronic medical record reviews to identify patients who had liver biopsies within a year from the date of their Fibroscan. 54 out of 417 patients underwent liver biopsies. 42 of the 54 patients were identified to have biopsy-proven NAFLD. The histological reports of the liver biopsies were reviewed and different stages of fibrosis were recorded. Liver fibrosis was classified as no fibrosis (F0), mild fibrosis (F1), moderate fibrosis (F2), severe bridging fibrosis (F3) and cirrhosis (F4). Clinical, radiological and biochemical data of these patients were also analysed, provided they were within 1 year from the dates of liver biopsies.

**Results** Out of the 42 patients identified, the mean age was 56 (±14) with a male preponderance (55%). 1 patient had no fibrosis (F0), 14 patients had mild fibrosis (F1), 1 patient had moderate fibrosis (F2), 14 patients had severe fibrosis (F3) and 12 patients had cirrhosis (F4). Correlation between different variables and stages of fibrosis were tested using the non-parametric Spearman’s correlation coefficient. Data are summarised in the table 1 below and are expressed as median ±IQR.

<table>
<thead>
<tr>
<th>Fibrosis Stage</th>
<th>Correlation Coefficient (p-Value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable</td>
<td>F0-F1</td>
</tr>
<tr>
<td>Liver stiffness measurement</td>
<td>10.1</td>
</tr>
<tr>
<td>(±5.8)</td>
<td>(±5.5)</td>
</tr>
<tr>
<td>LSM kPa</td>
<td>-0.64</td>
</tr>
<tr>
<td>(±2.67)</td>
<td>(±1.65)</td>
</tr>
<tr>
<td>NAFLD Score</td>
<td>0.6</td>
</tr>
<tr>
<td>(±0.13)</td>
<td>(±0.67)</td>
</tr>
<tr>
<td>APRI Score</td>
<td>1.26</td>
</tr>
<tr>
<td>(±1.84)</td>
<td>(±2.14)</td>
</tr>
<tr>
<td>UKELD Score</td>
<td>46 (±2.5)</td>
</tr>
<tr>
<td>(±3.25)</td>
<td>(±2.14)</td>
</tr>
</tbody>
</table>

**Conclusions** Our study indicated that there were statistically significant positive correlations between LSM, NAFLD score with FIB-4 score with different stages of fibrosis in patients with NAFLD. However, the correlations between AST to Platelet Ratio Index (APRI), United Kingdom Model for End-Stage Liver Disease (UKELD) score and different stages of fibrosis were not statistically significant. The difference may be due to the inclusion of clinical variables in the NAFLD score. The addition of LSM to the NAFLD score could potentially improve the diagnostic accuracy of fibrosis in NAFLD patients.

**PTH-108** **THE OUTCOME OF TRANSARTERIAL CHEMOEMBOLISATION FOR LIVER CANCER PATIENTS IN ABERDEEN ROYAL INFIRMARY**

Waneedh Taj-aldeen, Sajith Kattararambi, Fiona Clegg, Wilson Siu, Amalraj Raja, Lokeh Saraswat, Jack Staiton, Vijayan Bakasubaramaniam, Andrew Fraser, Lindsey Mclean, Ashis Mukhopadhya. Aberdeen Royal Infirmary, Aberdeen, UK

*Abstract* Hepatocellular carcinoma (HCC) is the 5th most common cancer worldwide, it often presents in advanced stages with small treatment options reflected in poor prognosis. Transarterial chemoembolisation (TACE) is an established palliative treatment for patients with advanced HCC, but outcomes vary. In this retrospective observation study, we assessed radiological response and survival outcome following TACE in a single large centre.

**Methods** Data was collected between October 2013 and December 2017 for all TACE procedures at Aberdeen Royal Infirmary by access to MDT records and radiological data. Basic demographics, aetiology and severity of underlying liver disease, lesion characteristics (number and size) and Barcelona staging (BCLC) were all recorded. Scans were reviewed by two consultant radiologists and modified RECIST criteria used to assess the radiological response (complete response: disappearance of all target lesions; partial response: minimum 30% decrease in sum of the longest diameter of target lesions).

**Results** 31 patients underwent TACE procedure (1 excluded due to loss of follow up). Mean age 68.5±7.33, 76.6% were male and 29/31 White British. All procedures used doxorubicin loaded beads. The main aetiologies were non-alcoholic fatty liver disease 11 (36%), Alcohol-related liver disease 10 (33.3%), hepatitis C virus 5 (16.6%). 86.7% had underlying liver cirrhosis. BCLC staging of patients was 12 (40%) A, 17 (56.6%) B, 1 (3.4%) C. 8 patients (26.6%) had TACE as a bridge for transplant or tumour resection.

A CT scan 6 weeks post-procedure showed 7 patients (23.3%) complete response while 19 patients (63.3%) had partial response, only 4 patients (13%) had no response. Of the 11 patients with a single tumour lesion <5 cm, 8 (72.7%) had complete response and 3 (27.3%) partial response. During the median follow up time of 17 months (1-41), 8/30 patients had progression of the same liver lesion (33.3%) while 11 (36.3%) developed new liver lesions, and 5 patients (16.6%) distant metastasis. 11 (36.3%) patients died during the follow up period, 3 (27.3%) had a small initial tumour lesion. Mortality rates at BCLC stage A was 5/12 (41.6%) and B 5/17 (29.4%). Of the 8 using TACE as a bridge to curative treatment, 3 underwent liver transplant, 2 remain active on transplant list, 1 underwent surgical resection and 2 were removed from the list. There were no major complications noted post TACE procedures.

**Conclusions** TACE helps to improve the survival and downstage HCC to allow curative treatment options. Only a small number had no radiological response to TACE. Those with initial BCLC B appeared to have a better survival, likely due to smaller numbers in stage A group. Those with a single
tumour lesion less than 5 cm showed the best radiological response rate and survival.

**PTh-109** IS THE SOARING PREVALENCE OF NAFLD FLYING UNDER THE RADAR OF HOSPITAL STAFF?

Nurun Tania, Bronwen Williams, Lynsey Corless. Hull and East Riding Hospitals, Hull, UK
10.1136/gutjnl-2018-BSGAbstracts.260

**Introduction** Non-alcoholic fatty liver disease (NAFLD) affects 25% of the population and is a frequent manifestation of the metabolic syndrome (MetS), therefore patients may be seen by healthcare professionals (HCP) in a variety of non-specialist secondary care teams. Awareness of the significance of NAFLD as a MetS co-factor, ability to offer basic lifestyle advice and recognise that specialist referral may be required is critical to optimising MetS care.

**Methods** A questionnaire study was conducted to examine non-specialist HCP knowledge of NAFLD in our large teaching hospital. Questionnaires were distributed at random to medical (n=20) and nursing staff (n=36) in several wards and clinics. Questions explored understanding of NAFLD risk factors, assessment and management.

**Results** Respondents were predominantly female (n=40), with median age 35 (range 20–60). Most (51/56; 91.1%) had heard of NAFLD but significantly fewer nurses were aware of non-alcoholic steato-hepatitis (NASH) than medics (47% vs 100%; p<0.001). Most (55/56; 98.2%) recognised that steatosis could cause liver damage, although serious complications were poorly appreciated including risk of liver cancer (32/56; 57.1%) and cirrhosis (45/56; 80.4%), with nurses significantly less aware of cirrhosis risk than medics (72.2% vs 95%; p=0.04). Awareness of MetS features as NAFLD risk factors varied; whilst most identified overweight/obesity (96.4%), significantly fewer recognised type 2 diabetes (T2DM) (76.8%; p<0.001) or hypertension (48.2%; p<0.001). Symptom knowledge was poor with nobody recognising NAFLD may be asymptomatic, and many thinking even early disease would be heralded by jaundice (24/56; 42.9%) or ascites (18/56; 32.1%). The majority understood need for ultrasound (52/56; 92.9%) and liver function tests (43/56; 76.8%) for diagnosis but importance of risk stratification was under- appreciated; just 62.5% would calculate BMI and 57.1% would test for T2DM. Although most (42/56; 75%) said NAFLD was preventable, 7/56 (12.5%) did not know that weight loss could reverse NAFLD, and just 19/56 (33.9%) identified the correct targets to offer appropriate weight loss advice. Knowledge of how to lose weight was also limited, with 12.5% recommending rapid weight loss, and only 32.1% (18/56) aware of the Mediterranean diet.

**Conclusions** There was a lack of recognition that early NAFLD may be asymptomatic despite causing harm, and limited understanding of the impact of MetS and lifestyle factors on both causation and treatment. Since patients with NAFLD are frequently encountered by non-specialists and are at high risk of morbidity, HCP NAFLD education should be improved to ensure that those presenting to other teams are advised appropriately and referred for liver risk assessment.

**Abstracts**

**PTh-110** ‘SAVE MY LIVER DOC, USE THE CARE BUNDLE!’

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10.1136/gutjnl-2018-BSGAbstracts.261

**Introduction** The first 24 hours is the most crucial timeframe for reducing morbidity and mortality in patients with decompensated liver cirrhosis and the use of the Cirrhosis Care Bundle in the first 24 hour has been shown to improve clinical outcomes in several tertiary centres across the UK. Our aim was to introduce the Cirrhosis Care bundle on the Medical Acute Unit (MAU) to improve the care of patients with decompensated liver cirrhosis.

**Methods** Two prospective audit cycles were conducted between Nov 2016 to April 2017. In each cycle, we prospectively reviewed all patients admitted with decompensated liver cirrhosis on the MAU. The first audit cycle was conducted between Nov to Dec 2016. Following which, several teaching sessions were organised to educate the MAU staff and doctors on the Cirrhosis Care bundle, one of which was delivered by Consultant gastroenterologist. Paper copies of the Cirrhosis Care bundle were also made available in the MAU. Second cycle was conducted after introducing the Cirrhosis care bundle.

**Results**

<table>
<thead>
<tr>
<th>No.</th>
<th>Quality Care Standards (Based on BSG guidelines)</th>
<th>Before (First audit cycle Nov – Dec 2016)</th>
<th>After (Second audit cycle Mar – April 2017)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.</td>
<td>Baseline investigations</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>3.</td>
<td>Blood culture if sepsis or SBP* suspected</td>
<td>100%</td>
<td>0%</td>
</tr>
<tr>
<td>4.</td>
<td>Ascitic tap</td>
<td>25%</td>
<td>50%</td>
</tr>
<tr>
<td>5.</td>
<td>Ultrasound abdomen ordered within 24 hour</td>
<td>55%</td>
<td>50%</td>
</tr>
<tr>
<td>6.</td>
<td>Alcohol history recorded</td>
<td>83%</td>
<td>77%</td>
</tr>
<tr>
<td>7.</td>
<td>CIWA completed</td>
<td>75%</td>
<td>88%</td>
</tr>
<tr>
<td>8.</td>
<td>Pabrinex given</td>
<td>75%</td>
<td>81%</td>
</tr>
<tr>
<td>9.</td>
<td>Broad spectrum antibiotics given in SBP</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>10.</td>
<td>IV Albumin given in SBP</td>
<td>0%</td>
<td>50%</td>
</tr>
<tr>
<td>11.</td>
<td>Fluid resuscitation in AKI</td>
<td>40%</td>
<td>0%</td>
</tr>
<tr>
<td>12.</td>
<td>Diuretics ad nephrotoxic drugs stopped in AKI</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>13.</td>
<td>Transfused if Hb&lt;7 g/dL in a suspected or actual GI bleed</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>14.</td>
<td>Coagulopathy corrected in a suspected/actual GI bleed</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>15.</td>
<td>Referred for early endoscopy in a suspected/actual GI bleed</td>
<td>75%</td>
<td>100%</td>
</tr>
<tr>
<td>16.</td>
<td>Given Terlipressin in a suspected/actual GI bleed</td>
<td>0%</td>
<td>71%</td>
</tr>
<tr>
<td>17.</td>
<td>Given antibiotics prophylaxis in a suspected/actual GI bleed</td>
<td>0%</td>
<td>30%</td>
</tr>
<tr>
<td>18.</td>
<td>Lactulose or enema given in hepatic encephalopathy</td>
<td>71%</td>
<td>100%</td>
</tr>
<tr>
<td>19.</td>
<td>Dalteparin given in no contraindications</td>
<td>42%</td>
<td>50%</td>
</tr>
</tbody>
</table>
Conclusions After formally adopting the Cirrhosis care bundle, we have seen an improvement in the frequency of ascitic taps performed, treatment of spontaneous bacterial peritonitis, prescription of VTE prophylaxis and hepatic encephalopathy. Our targets have certainly approved but not enough to meet quality standards. It was decided to conduct third cycle to improve our targets. We decided to educate doctors in A and E because patients spend more time there before being transferred to MAU due to pressures on NHS. The teaching involved identifying patients presenting with signs and symptoms of decompensated liver disease and education about the cirrhosis care bundle, its importance. Third cycle is in progress and showing promising Results.

**Investigation update**

**PTH-112 A CLUSTER OF GENOTYPE A2 ‘PRISONER VARIANT’ ACUTE HEPATITIS B INFECTION**

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10.1136/gutjnl-2018-BSGAbstracts.263

**Introduction**

April 2012 and May 2015, a cluster of acute Hepatitis B virus (HBV) infection was investigated by Public Health England (PHE) in Southwest England. Compared nationally, it was observed that cases were above the average age, all male and did not belong to typical ‘high-risk’ groups; with a majority reporting no risk-factors for HBV exposure. It was hypothesised that these cases were linked by a common source of transmission or a shared behaviour and that this link could be demonstrated by phylogenetic analysis.

**Methods**

A case definition of men, aged 35–75, presenting with acute HBV, with no recorded risk factors, was adopted. The PHE Database ‘HP zone’ was used to compile a line list of new acute HBV matching the case definition within the undisclosed county, from January 2012 to January 2015. Inclusion criteria for all cases required HBV core IgM positive status with clinical symptoms or biochemical markers consistent with acute hepatitis. Data on risk factors was compiled, as part of routine investigation, from the PHE acute HBV questionnaire using open and focussed questioning. Serum specimens on the line list were sent to the PHE laboratory, Colindale for phylogenetic analysis.

**Results**

33 cases of acute HBV were identified with 19 men fitting the case definition. The line list was expanded to include the remaining 7 men aged 35–75 in the same region and timeframe who did report risk factors for HBV exposure (total=26). 6 cases did not have stored serum for genotyping. 17 cases of HBV Genotype A2 were identified, 14 of the 19 cases that fitted the definition described themselves as heterosexual and married at the time of diagnosis. All spouses tested negative for HBV. Of the 17 A2 genotypes 16 were 99%–100% identical at the nucleotide level with one case differing by a single base pair at the HBsAg region. All cases were of a single, stable strain known as the ‘Prisoner Variant’, which has increased in prevalence from 1990, primarily in the prison population of north England.

**Conclusions**

The genotypic link of at least 16 cases with a non-prevalent strain of HBV indicates a common source of infection. The lack of confirmed risk factors in so many cases may indicate a shift in the ‘epi-picture’ with new behaviours making at-risk groups harder to identify for targeted health-
education or vaccination. The cluster remains active with further cases being investigated.

Abstract PTH-112 Figure 1  Epidemic curve displaying cases of acute Hep B per quarter 2012 to 2015; cases other than A/A2 excluded

Introduction Biliary anastomotic strictures (AS) occur in around 30% of patients following liver transplantation and are treated by endoscopic dilation and plastic stent (PS) insertion. However, as frequently recur and require multiple procedures. The Kaffes stent (KS, Taewoong Medical) is a removable, covered metal stent designed to be deployed across AS.

Methods To examine outcomes in patients with AS, we compared a recent cohort of patients treated using KS with a historical cohort of patients who received PS.

Results The 22 patients (12 females) treated by KS had mean age 55 (range 22–69) years; 11 patients had DBD and 11 DCD grafts; mean cold ischaemia time was 9.6±3.3 hours. Four patients had failed previous treatment with PS. To date, 16 patients have had KS removed. The 69 patients (20 females) treated by PS were similar, mean age 51 (range 28–79) years; 47 patients had DBD and 22 DCD grafts; mean cold ischaemia time was 8.9±3.1 hours.

AS resolved after one deployment of KS in 14 out of 16 patients (88%) compared to 26 out of 69 patients (38%) receiving their first PS (Relative Risk of persistent stricture (KS vs PS)=0.2, 95% CI 0.05–0.74; p=0.016; number to treat by KS for one benefit=2, 95% CI 1.3–4.0). There were no complications, including stent migration, after KS compared to 6 (8.4%) in the PS group (3 cholangitis, 2 pancreatitis, and 1 bleeding). All KS were removed successfully, although 1 stent needed 2 attempts because of wire migration. Following initial ERCP, PS patients required more ERCPs (mean 2.71 vs 1.13 more; p<0.01) and 32% required biliary reconstruction.

Conclusion Our data indicate that the KS is a promising Method for managing post-transplant AS because the majority of strictures are treated by deployment of a single stent at first ERCP.

Introduction Cholangiography at endoscopic retrograde cholangio-pancreatography (ERCP), the reference standard for detecting CBDS, is not practicable as the primary Method for identifying CBDS as it is invasive and has an associated morbidity. With regard to the non-invasive identification of CBDS, the current BGS guidance outlines pooled sensitivities of 73%, 69%–87% and 93% for ultrasound (US), computed tomography (CT) and magnetic resonance cholangio-pancreatography (MRCP) respectively. In this study we report the real-world sensitivity of these imaging modalities to detect CBDS.

Method All cases of CBDS confirmed at ERCP over 12 months were identified prospectively. The imaging modalities employed prior to ERCP were identified and evaluated for the presence or absence of duct dilatation (>6 mm) or intra-ductal contents (stone or sludge) thereby defining the sensitivity of these parameters for detecting CBDS. 95% confidence interval (CI) of the sensitivities was calculated.

Results In total, 102 patients had ERCP for CBDS (female 57%) after presenting with pain (83%) and jaundice (45%). Liver function tests were abnormal in 82%. 48 patients had CBDS ≥1 cm (maximum size 35 mm, mean 9.6 mm). All US scans in this study were performed by sonographers.

Overall US performed poorly for the detection of CBDS even when accounting for stone size. As the presence of overlying bowel gas may have contributed to these Results, a further analysis was performed after excluding the 22 cases (25%) in which the bile duct could not be visualised at US. In this sub-group analysis, the sensitivity of US for detecting CBDS remained similar (dilated CBD sensitivity 64% and intra-ductal content sensitivity 18%).

Conclusion Our study demonstrates that US performs poorly in the detection of CBDS in a real-world setting even when
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accounting for confounding factors such as overlying bowel gas or stone size. In our study, approximately one third of patients with CBDs did not have a dilated CBD on US (diameter ≤6 mm). Moreover, due to spectrum bias it is likely that the true sensitivity of US in the wider population is much lower. By contrast, the performance of both CT and MRCP was more comparable with published data. Whereas our findings may relate specifically to the performance of US in our unit, a larger study continues to determine if the sample size has contributed to our findings.

TREATMENT OF GASTRIC FUNDAL VARICES WITH EUS GUIDED EMBOLISATION COMBINING COIL PLACEMENT WITH THROMBIN INJECTION

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Introduction Gastric varices are present in 5%–33% of patients with portal hypertension with incidence of bleeding of around 25% in 2 years.1 If gastric varices are identified as the source of bleeding, therapeutic options include endoscopic Methods, TIPSS, surgery and non-selective beta blockade.2 There are reports of EUS guided coiling combined with cyanoacrylate glue3 but limited literature on safety and efficacy of EUS guided coil embolisation with human thrombin injection. We report our experience.

Methods We analysed data of all EUS guided interventions for the management of bleeding gastric varices between 2015–2017 at a liver transplant centre. Olympus EUS linear scope was used to inject human thrombin (Tisseel; 500IU/ML) in gastric varices with or without coils (Nester Embolisation Coils).

Results A total of 10 EUS guided interventions in 6 patients (4 M and 2 F), aged 55 (41–59) yrs for secondary prophylaxis. 67% patients had cirrhosis with MELD score of 14(10–21) and 75% were Child-Pugh class C. The remainder had non-cirrhotic portal hypertension. All patients had previous bleeding from gastric varices and 2/3rd were intolerant of beta-blockers. 67% had previous thrombin injection that failed to obliterate the gastric varices. EUS guided coil embolisation was undertaken with thrombin injection in 6, and thrombin alone in 4 (2 had previous coils embolisation). The largest feeding vessel was 12(7–16) mm with a median 5 (2–10) coils placement followed by thrombin injection of 3500 (2500–5000) IU.

Most (8/10) stayed overnight after intervention and only 2 required longer stays, Median F/U was 9 (3–20) months with zero 30 day mortality. 1 patient had fever 2 days post procedure requiring IV antibiotics. No reported episodes of re-bleeding except in 1 patient at 23 months. 4 had follow up EUS (5–7 months) and showed no flow at the level of the coils. 1 patient died within 3 months of procedure secondary to hepatic decompensation.

Conclusions In our experience EUS guided coil embolisation and injection of thrombin, is a technically safe and well-tolerated procedure even in patients with advanced liver disease especially who have failed eradication of gastric varices from single modality therapy. Due to the lower incidence of gastric variceal bleeding in comparison to oesophageal varices bleeding, we recommend multi-centre prospective data collection evaluating the modalities being used and reporting of outcomes to help inform national guidelines.

References

Oesophagus and Gastrointestinal

VITAMIN D RECEPTOR AS A MARKER OF PROGNOSIS IN OESOPHAGEAL ADENOCARCINOMA: A PROSPECTIVE COHORT STUDY

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Background Vitamin D receptor (VDR) expression has been associated with survival in several cancers. This study aims to evaluate the association between VDR expression and prognosis in oesophageal adenocarcinoma patients.

Methods The study included 130 oesophageal adenocarcinoma patients who underwent neo-adjuvant chemotherapy and surgery at the Northern Ireland Cancer Centre between 2004 and 2012. Formalin fixed paraffin embedded (FFPE) resection specimens and matched clinical data were retrieved via the Northern Ireland Biobank. Tissue microarrays (TMAs) were created and VDR immunohistochemical analysis performed on triplicate 1 mm tumour cores from each block. Immunohistochemical VDR expression was assessed by two independent observers, blinded to the clinical data, by multiplying the staining intensity with the percentage of tumour cells staining positive for VDR, to give an H-score between 1 and 300. Comparison between maximum VDR expression and prognosis was calculated using Cox proportional hazards regression model.

Results During a mean of 3 (range 0.5–9) years of follow-up, 75 patients died. In analysis adjusted for confounders, higher VDR expression was associated with an improved overall survival (HR 0.49 95% CI 0.26–0.94) and disease-specific survival (HR 0.50 95% CI 0.26–0.96), when comparing the highest with the lowest tertile of expression. These associations were strongest in sensitivity analysis restricted to junctional tumours.

Conclusions This study is the first to demonstrate that patients with higher VDR expression in oesophageal adenocarcinoma have a more favourable prognosis. This study identifies VDR expression as a potential prognostic indicator although further work is needed to validate VDR as a prognostic marker and define its role in the aetiology and progression of oesophageal adenocarcinoma.