Competing interests None declared.

REFERENCE

1. **Solaymani-Dodaran M**, Card TR, Aithal GP, *et al.* Fracture risk in people with primary biliary cirrhosis: a population-based cohort study. *Gastroenterology* 2006;**131**:1752.

PWE-278 DOES N-ACETYL CYSTEINE MODULATE RENAL FUNCTION AFTER MAJOR HEPATECTOMY?

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Introduction Acute kidney injury or deterioration in pre-existing renal dysfunction following major hepatectomy is an important cause of morbidity and mortality. N-acetyl cysteine has been extensively utilised as a reno-protective agent to ameliorate contrast induced nephropathy. The aim of this study was to investigate its potential use for preserving renal function following major hepatectomy.

Methods A prospective study to compare the impact of N-Acetyl cysteine (NAC) on liver function after hepatectomy was undertaken in our Unit from 2004 to 2010. A cohort of 44 patients received perioperative NAC (10 g/24 h) for 5 days and were compared to a further cohort of 44 patients (matched for the extent of liver resection—all more than three segments), gender, age and chemotherapy use) who did not. Post-operative renal function was evaluated. Other variables known to influence renal function included associated co-morbidity, drugs, intra-operative parameters (eg, CVP and blood loss). In addition to calculating the renal risk index as described by Clavien *et al.* We also examined other outcome measures such as duration of renal support and long-term renal specific outcomes.

Results There were three patients with known CKD in the NAC group as compared to one in the control group. Mean (SD) preoperative creatinine levels [93.9 (20.5), 92.5 (19.3) p=0.7], BMI [26.9 (14.5), 28.9 (13.1) p=0.3], operating time (h) [6 (1.9), 5.5 (1.7), p=0.9]. The mean renal risk index were also similar between the NAC and control group. Mean (SD) creatinine rise (delta creatinine) between days 1 and 5 in the post-operative period, were also similar between the 2 groups [NAC 43.8 (82.9) vs Control 49.2 (63.5), p=0.72]. Renal support in the form of CVVH was needed in three patients in the study group vs one in the control group (all known to have pre-existing CKD). All these patients went back to their preoperative renal status at 3-months follow-up.

Conclusion In this study NAC does not appear to be reno-protective in patients with known renal impairment who require a major liver resection. Its presumed renoprotective role in those at "high risk" needs to be further assessed in an adequately powered RCT.

Competing interests None declared.

PWE-279 THE HEPATIC EFFECTS OF A HIGH FRUCTOSE VS A HIGH GLUCOSE DIET IN HEALTHY OVERWEIGHT MEN

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Introduction A high intake of fructose has been implicated in NAFLD aetiology. As the majority of dietary fructose originates from sucrose it remains uncertain if these observations are fructose-specific. Infrequent and inconsistent differences in hepatic metabolism have been shown with a high intake of fructose or glucose, the constituents of sucrose.[1 2] There is no prior comparative data in healthy overweight men, and none in the isoenergetic state.

Methods 32 healthy, centrally overweight males were randomised to two periods each of 2 weeks of either a high fructose or glucose intake in a non-crossover fashion. Isoenergetic status was maintained by providing foodstuffs during the first period, followed by a 6-week washout and then a second period of *ad libitum* overfeeding. The sugars contributed 25% of predicted total energy requirements, and were consumed 4 times a day dissolved in water. The primary outcome was hepatic triglyceride content (^{1}H MRS), with further assessments of calf lipid (^{1}H MRS), deuterated glucose hyperinsulinaemic euglycaemic clamps, and indirect calorimetry. Outcomes assessed by Student t test.

Results The groups were well matched at study entry. Overall the subjects' mean age was 34 years, BMI 29.4 kg/m^2 and daily dose of sugars was 217 g. The changes in the primary measures are shown in the Abstract PWE-279 table 1 below. There were no changes during the energy balanced period. With energy and monosaccharide overfeeding weight, serum triglycerides, liver lipid and biochemistry increased significantly, but to a similar extent in both groups. Further to this the groups did not differ in terms of satiety, whole body oxidative profile, hepatic insulin resistance, calf lipid, or renal function.

Abstract PWE-279 Table 1

	Energy balance	Fructose, mean	SD	Glucose, mean	SD	Sig between, groups
Weight (kg)	Iso	−0.26	0.92	0.12	0.70	0.62
	Excess	1.03*	1.37	0.57*	1.00	0.29
Hepatic lipid (%)	Iso	0.30	2.20	−0.05	2.13	0.65
	Excess	1.70*	2.60	2.05*	2.89	0.73
ALT (U/l)	Iso	−4.0	7.9	−2.9	6.5	0.67
	Excess	5.8*	8.7	4.1	9.8	0.62
Triglyceride (mmol/l)	Iso	−0.07	0.35	0.13	0.74	0.35
	Excess	0.36	0.75	0.33**	0.39	0.91

Absolute change in parameters during intervention (*p<0.05, **p<0.01 as compared to baseline values in that group).

Conclusion There were no differences between a high fructose and glucose diet in relation to hepatic lipids or biochemistry. The changes during the overfeeding period were strongly associated with changes in weight, reinforcing the interpretation that these were an energy, as opposed to a nutrient, specific effect.

Clinical trial registration number NCT01050140.

Competing interests None declared.

REFERENCES

1. **Stanhope KL**, Schwarz JM, Keim NL, *et al.* Consuming fructose-sweetened, not glucose-sweetened, beverages increases visceral adiposity and lipids and decreases insulin sensitivity in overweight/obese humans. *J Clin Invest* 2009;**119**:1322—34.
2. **Ngo Sock ET**, Lê KA, Ith M, *et al.* Effects of a short-term overfeeding with fructose or glucose in healthy young males. *Br J Nutr* 2010;**103**:939—43.

PWE-280 FERROPORTIN DISEASE—AN IMPORTANT CAUSE OF IRON OVERLOAD

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Introduction Ferroportin disease is a recently characterised cause of iron overload. Unlike hereditary haemochromatosis it involves

genetic mutations of SLC40A1 gene, and has autosomal dominant transmission. We describe here 3 siblings with typical features.

Methods All cases had evaluation of liver function, serum iron markers and relevant molecular genotyping. One case (male) had liver MRI scan and two cases (female) had liver biopsy.

Results Median age was 41. None of them had other risk factors for liver disease. All had normal liver biochemistry, with elevated ferritin levels >1500 μg/l and transferrin saturations consistently below 40%. Liver MRI scan suggested iron deposition. Liver biopsies showed normal architecture with iron deposition mainly restricted to Kuppfer cells with no hepatocellular damage. Molecular genotyping identified SLC40A1 gene mutation in all cases. The male underwent four venesections which were poorly tolerated and have been suspended, while the females accepted an expectant approach.

Conclusion These cases illustrate features of classical ferroportin disease, with hyperferritinemia, normal transferrin saturation and Kuppfer cells iron loading with no evidence of hepatocyte injury. The natural history of this phenotype is unclear thus require long term follow-up. However, other mutations with a greater likelihood of causing liver injury have been described.

Competing interests None declared.

REFERENCE

1. **Mayr R**, Janecke AR, Schranz M, *et al*. Ferroportindisease: A systematic meta-analysis of clinical and molecular findings. *J Hepatol* 2010;**53**:941–9.

PWE-281 DIFFERENT EFFECTOR T CELL RESPONSES MAY ACCOUNT FOR DIFFERENT PATTERNS OF LIVER INJURY IN CHILDHOOD AUTOIMMUNE LIVER DISEASE

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Introduction Two childhood autoimmune liver diseases are recognised: "classical" autoimmune hepatitis (AIH) and AIH-sclerosing cholangitis overlap syndrome (also termed as autoimmune sclerosing cholangitis, ASC). ASC is characterised by ANA and/or SMA seropositivity, hypergammaglobulinaemia and interface hepatitis—all features typical of "classical" AIH—in conjunction with bile duct destruction. Previous studies showed that regulatory T-cells, a subset essential for immune-tolerance maintenance, are defective in both conditions. Whether different CD4 and CD8 effector T-cell responses account for the clinical spectrum of childhood autoimmune liver disease is unknown. Aims: to evaluate the frequency and phenotype of CD4 and CD8 T-cells in patients with AIH and ASC.

Methods 6 patients with AIH, six patients with ASC, and six healthy subjects (HS) were studied. The frequency and phenotype of T-cells was evaluated by cytofluorimetry using monoclonal antibodies against CD3, CD4 and CD8. Expression of T-bet, RORC, IFN-g and IL-17 was determined by intracellular staining.

Results The frequency of $CD4^{pos}$cells within total lymphocytes was lower in ASC (36.5±3.6), compared to AIH (47.2±2.7, p=0.04) and HS (46.8±2.1, p=0.04). Conversely, ASC patients displayed higher percentage of $CD8^{pos}$cells (31.8±2) than in AIH (21.8±2.5, p=0.01) and HS (22.9±1.3, p=0.03), therefore exhibiting a lower CD4:CD8 compared to AIH and HS. Within $CD4^{pos}$T-cells: (a) T-bet^{pos} and IFN-g^{pos}cells were higher both in AIH and ASC compared to HS (T-bet: p=0.01 for AIH, p=0.05 for ASC; IFN-g: p=0.02 for AIH, p=0.03 for ASC); (b) $RORC^{pos}$ and IL-17^{pos}cells were more frequent in ASC than in AIH (RORC: p=0.001; IL-17: p=0.02). Within CD8-T cells: (a) IFN-g-producing cells were higher in AIH and ASC than HS (p=0.004 for AIH, p=0.08 for ASC); b) IL-17-producing cells were higher in ASC compared to AIH (p=0.05). In ASC, frequency of $CD4^{pos}$ and $CD8^{pos}$IL-17^{pos}cells correlated with γ-glutamyl-transpeptidase (R=0.90, p=0.01 for CD4; R=0.84, p=0.04 for CD8), and with alkaline phosphatase levels (R=0.75, p=0.09 for CD4; R=0.80, p=0.06 for CD8).

Conclusion Both AIH and ASC are associated with an increase of IFN-g-producing cells. Compared to AIH, ASC patients have more CD8 T-cells, and higher number of IL-17-producing T-cells. The correlation with cholestatic biochemical abnormalities suggests that IL-17 is involved in bile duct involvement characteristic of ASC.

Competing interests None declared.

PWE-282 THE ROLE OF α-FETOPROTEIN IN HEPATOCELLULAR CARCINOMA SURVEILLANCE

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Introduction The most efficient and cost-effective programme for HCC surveillance is the subject of ongoing debate. Current UK standard practice for HCC surveillance in high risk populations consists of 6 monthly ultrasound (US) and α-fetoprotein (AFP) measurement. However, the most recent international guidelines on HCC surveillance (AASLD) state that US alone is the most appropriate means of HCC surveillance.[1 2] To investigate the relative contributions of US and AFP to HCC surveillance we have performed a retrospective analysis of the records of consecutive cases of newly diagnosed HCC within two patient cohorts.

Methods We retrospectively reviewed the electronic records of: (1) All 78 patients diagnosed with HCC in NHS Lothian between 1 January 2010 and 30 September 2011. (2) All 46 patients referred to the Scottish Liver Transplant Unit (SLTU) with HCC for liver transplant assessment from 1 January 2010 to 31 August 2011. Demographic details, mode of HCC detection and patient outcomes were recorded. Patients were identified as undergoing HCC surveillance if they were having 6 monthly US and AFP measurements. An elevated AFP was defined as >6 kU/l.

Results 36% (28/78) of the patients diagnosed with HCC in NHS Lothian were diagnosed through HCC surveillance. Of these 28 patients 39% (11/28) had the suspicion of HCC raised by AFP alone, 32% (9/28) were detected by both AFP and US and only 25% (7/28) were detected by US alone. 1 HCC was detected by CT scan. The overall sensitivity of AFP for detecting HCC in the surveillance group was 71% (20/28). 84% (36/43) of the SLTU cohort were diagnosed through regular HCC surveillance. 33% (12/36) by AFP alone, 25% (9/36) by US alone and 42% (15/36) by both AFP and US. 69% (25/36) had a raised AFP at HCC diagnosis. 76% (19/25) of patients with a raised AFP at diagnosis were offered potentially curative treatment.

Conclusion In conclusion our data does not support the current AASLD guidelines stating US alone should be used for HCC surveillance. In both patient cohorts over a third of HCC cases detected through surveillance were identified by a rising AFP alone. Our results indicate AFP is therefore an important and effective addition to US. Additional refinement of how AFP levels are interpreted, in particular progressive rises in AFP, may enable increased sensitivity and specificity and further improve the efficacy of HCC surveillance.

Competing interests None declared.

REFERENCES

1. **Bruix J**, Sherman M. *Management of Hepatocellular Carcinoma: An Update*. 2010. http://www.aasld.org/practiceguidelines/ (accessed Feb 2011).
2. **Marrero Jorge A**, El-Serag Hashem B. Alpha-fetoprotein should be included in the hepatocellular carcinoma surveillance guidelines of the american association for the study of liver diseases. *Hepatology* 2011;**53**:1060–1.