**Association of Non-alcoholic fatty liver disease with renal progression in**

**advanced diabetic nephropathy**

**Introduction:** Non-Alcoholic Fatty liver disease(NAFLD) has been shown to be a risk factor for the development of diabetic nephropathy in patients with type 2 diabetes mellitus. The association of NAFLD with renal progression in advanced diabetic nephropathy has not been explored.

**Objective:** To assess the impact of NAFLD on the rate of progression of CKD in a cohort of patients with advanced diabetic nephropathy (CKD 3-5 not on dialysis).

**Methods:** All patients registered in the Salford Kidney Study (SKS) (a large prospective CKD cohort) with a diagnosis of diabetic nephropathy and who had an Ultrasound (US) of the liver performed between January 2000 and December 2014, were sampled in this retrospective observational study. Estimated glomerular filtration rate (eGFR) as measured by the CKD-EPI formula was collected for all patients from the study start date (US date) until the study end which included commencement of renal replacement therapy or reaching eGFR <10 ml/min, death, loss to follow-up or censoring at 31 December 2015. The rate of decline in eGFR was calculated by the slope of linear regression. Cox regression analysis was used to study the association of NAFLD with ESRD.

**Results:** Of the 2974 patients registered in the SKS during the study period, 508 (17%) were diagnosed with diabetic nephropathy. 245 (48%) of the 508 patients had US imaging of the liver. After excluding patients based on pre-set criteria, a sample of 149 (48 NAFLD and 101 normal US) patients with complete datasets remained. At baseline, the median age of the study group was 65 years, median eGFR was 31.6 mL/min/1.73m2,with urine protein creatinine ratio 46 g/mol and HBA1C 57.3 mmol/mol. Patients with NAFLD had greater prevalence of hypertension, hypercholesterolemia and ischemic heart disease at baseline (Tabe-1). BMI was significantly higher in the NAFLD group (32 vs 29 kg/m2; p= <0.05). Median follow-up time was 69 months with no difference between groups (p=0.094). Regarding CKD progression, although there was faster decline of eGFR noted in patients with NAFLD, this did not reach statistical significance. (NAFLD: -3.97 ml/min/yr; normal liver: -2.95 ml/min/yr; p=0.650). Also, in a Cox regression model adjusted for baseline eGFR, NAFLD did not show any correlation with ESRD (HR: 0.84; 95%CI 0.40-1.76; p=0.65)

**Conclusions**: In our cohort of advanced diabetic nephropathy patients the presence of NAFLD did neither accelerate the rate of progression of CKD nor showed an association with reaching ESRD.

Table-1: Baseline Characteristics

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| **VARIABLE** | **NAFLD**  **n=48** | **NORMAL**  **n=101** | **P-VALUE**  **NAFLD**  **vs Normal** |
| BMI, Median (IQR) | 31.6 (28.7- 35.1) | 29.41 (25.9-34.08) | **0.040** |
| H/o Hypertension | 47 (97.9%) | 83 (82%) | **0.007** |
| H/o Hypercholesterolemia | 43 (89.5%) | 75 (74.2%) | **0.031** |
| H/o Ischemic Heart Disease | 24 (50%) | 27 (26.7%) | **0.005** |