Prevalence of Non-Alcoholic Fatty Liver in individuals of Arabic origin attending diabetes services in the UAE

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Background

Non-alcoholic fatty liver disease (NAFLD) is highly prevalent worldwide. Type 2 diabetes is an important risk factor for NAFLD. Existing clinical risk scores for simple fatty liver (FL) and Non-alcoholic steato-hepatitis (NASH) have not been validated in Arabic populations. Screening for NAFLD is usually performed in response to deranged liver transaminases, but the sensitivity and specificity of these are limited.

Aims

To establish the prevalence of FL and NASH in Arabic people with type 2 diabetes. The secondary aim was to establish the utility of commonly available screening tests for NAFL in our population.

Methods

People of Emirati (n=257) or other Arabic origin (n=28) were recruited by convenience sampling from clinical areas at Imperial College London Diabetes Centre (ICLDC).

Liver ultrasound and acoustic force radiation imaging (ARFI) were performed using the Siemens S2000 Acuson system. Fatty liver grade (FLG) was determined as 0 (no disease), 1 (bright parenchyma), 2 (loss of definition of portal veins), or 3 (loss of definition of right hemidiaphragm). Up to ten measurements of ARFI shear wave velocity were taken from the right lobe of the liver in each participant.

Median shear wave velocity was determined in 285 individuals in whom a minimum of eight shear wave velocity measurements were made and where the interquartile range of all measurements was less than 0.5 m/s. Median shear wave velocity cutoffs for mild and significant fibrosis and possible cirrhosis were ≥1.35 m/s, ≥1.61 m/s, ≥1.87 m/s respectively.

Results

22% of individuals with prediabetic conditions, and 23.1% of individuals with normoglycaemia, showed evidence of some grade of NAFL, as compared to 49.1% of individuals with type 2 diabetes mellitus. No changes of fatty liver were identified in any of the three patients with type 1 diabetes.

Diagnosis	FLG 0	FLG 1	FLG 2	FLG 3
Normal	10 (76.9%)	3 (23.1%)	0 (0%)	0 (0%)
Prediabetes	18 (78.3%)	2 (8.7%)	2 (8.7%)	1 (4.3%)
Type 2 diabetes	141 (50.9%)	77 (27.8%)	52 (18.8%)	7 (2.5%)
Type 1 diabetes	3 (100%)	0 (0%)	0 (0%)	0 (0%)
Total	**172 (54.4%)**	**82 (25.9%)**	**54 (17.1%)**	**8 (2.5%)**

Table 1 Grade of fatty liver disease as assessed by ultrasound in 316 individuals of Arabic origin resident in the UAE.

ARFI was suggestive of the presence of fibrosis in eight individuals (3.3%) with type 2 diabetes mellitus, of whom seven had evidence of mild fibrosis and one had evidence of significant fibrosis. No evidence of fibrotic disease was found in any individual with normal glucose tolerance, impaired glucose tolerance, type 1 diabetes or gestational diabetes.

Automated regression analysis identified log-transformed ALT, GGT, waist circumference and log-transformed HOMA2-IR as predictors for any degree of NAFL (OR 67.89 (13.88-385.14), p<0.0001; OR 0.98 (0.97-0.99), p<0.0001; OR 1.03 (1.00-1.05), p-0.042; OR 1.78 (1.13-2.94), p=0.018, respectively), but the overall model fit was poor, Nagelkerke pseudo-R squared 0.29. There were insufficient fibrosis endpoints to establish risk factors in our cohort.

Discussion

Non-alcoholic fatty liver disease is common in people of Arabic origin resident in the UAE, particularly in those with type 2 diabetes mellitus. Despite this, progression to fibrosis appears to be rare in our patient population. Although elevated liver transaminases and markers of insulin resistance appear to predict the presence of nonalcoholic fatty liver, their prognostic accuracy is poor and imaging is recommended.