

Screening for non-alcoholic fatty liver disease in the obesity epidemic.

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Background and Aims:

Non-alcoholic fatty liver disease (NAFLD) is increasing in prevalence worldwide in parallel with the obesity and diabetes epidemics. Non-alcoholic steatohepatitis (NASH) has become the third most common indication for liver transplantation in the USA. The outpatient diabetes clinic provides opportunities for screening and early treatment of NAFLD and NASH; however no single non-invasive test reliably predicts NAFLD or progression to fibrosis.

Materials and Methods:

Study population: 1332 adult individuals in whom ultrasound (US) of the whole abdomen or liver was performed for any indication between 2007 and 2014, at an outpatient diabetes/general medical clinic. 804 individuals with T2DM, 226 with impaired glucose tolerance, 19 with T1DM and 283 with normal glucose tolerance were included. Median BMI of participants was 29.1 kg/m² (IQR 27.47 – 33.71 kg/m²); all were seronegative for hepatitis B and C infection.

Protocol: US was performed by a single consultant Radiologist and fatty infiltration graded according to standardised criteria. Relationships between US findings and contemporaneous clinical markers were explored retrospectively.

Results:

US identified 628 individuals with normal liver parenchyma, and 26 with mild, 305 with moderate, and 373 with severe fatty infiltration. By maximisation of the area under the receiver operator characteristic curve (AUC ROC) for US-detected changes, optimal cut-points for serum ALT were 65 IU/L in men and 40.4 IU/L in women, but this alone provided inadequate discrimination (AUC ROC 0.61 male, 0.56 female). Serum GGT was a poor predictor of fatty infiltration (AUC ROC 0.518). The Fatty Liver Index of Bedogni et al., calculated in 1212 individuals in whom parameters were available, also performed poorly in this population (AUC ROC 0.673). Stepwise logistic regression in 300 randomly-chosen individuals identified log(triglycerides), log(ALT), BMI, serum albumin and prescription of metformin as significant predictors. This model provided better discrimination when applied to the remaining participants (AUC ROC 0.741).

Conclusion:

Screening tests based on a single parameter are unable to predict the presence of fatty liver disease. Currently available risk scores perform poorly in a predominantly overweight population with a high prevalence of insulin resistance; new methods of screening and stratification are needed.

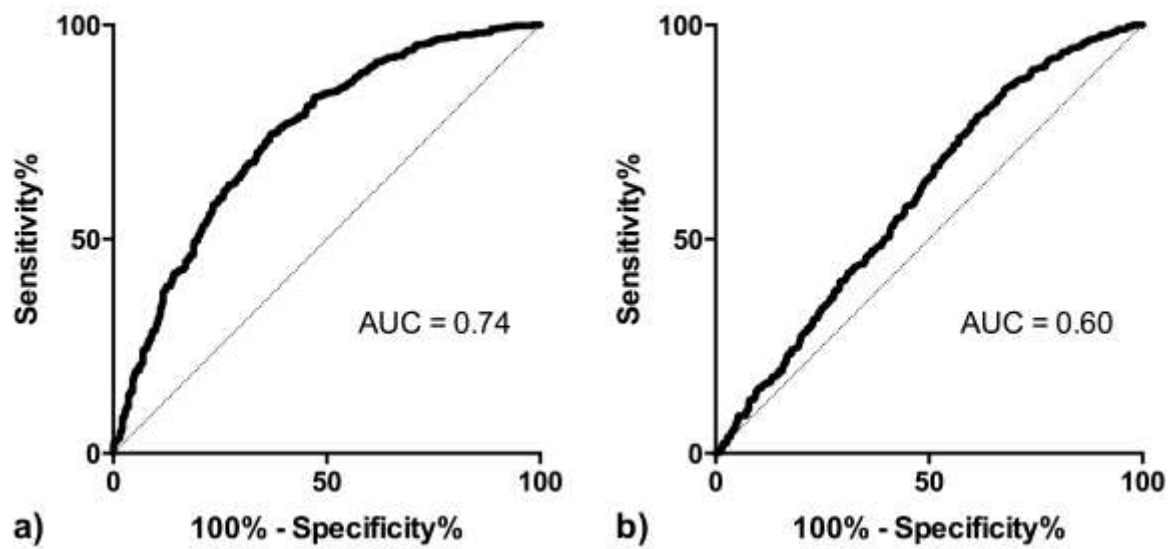


Figure: ROC curves of derived logistic regression model (a) and serum ALT (b) for prediction of coexisting US-detected changes of fatty liver.