EMIF Deliverable 7.3: Development and testing of algorithms to predict clinical outcomes in obese adults (and potentially children) against a range of obesity-related clinical outcomes

Executive summary

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Obesity is an important and well known risk factor for many diseases. However, considerable variability in obesity realted outcomes exists among obese individuals and we currently lack adequate tools to predict which patients are likely to experience obesity related mobidity. Prediction of disease progression is particulary challenging in non-alcoholic fatty liver disease (NAFLD) patients. This deliverable focused on identifying clinical features associated with fatty liver disease progression, including liver outcomes (cirrhosis and hepatocellular carcinoma), and cardiovascular disease (acute myocardial infarction and stroke) in patients diagnosed with fatty liver disease. Identification of clinical features associated with disease progression is a first step towards building an algorithm to predict disease endpoints.

Non-alcoholic fatty liver disease (NAFLD) poses a major challenge to health services worldwide. The likelihood of progression to more advanced stages of disease and risk of cardiovascular disease in unselected 'real world' healthcare records are unknown. We used data extracted from electronic healthcare records of 18 million adults across 4 European countries. In this study, we compared the rates of new diagnoses of cirrhosis and hepatocellular carcinoma (HCC) in patients with existing diagnoses of NAFLD or NASH to those who do not have NAFLD or NASH diagnoses. We found significant rates of progression with significantly greater hazard ratios in patients compared to controls and in those with high-risk non-invasive fibrosis scores. Diabetes was the key independent predictor of cirrhosis and/or HCC in both patients and in controls. To our knowledge, this is the first study to use advanced epidemiological techniques and semantic harmonisation to estimate the risk of fatty liver disease progression at a population level. By identifying people living with diabetes as those at greatest risk of disease progression, our study people helps us identify those most likely to benefit from the new drugs in development for this condition. We found that CVD risk did not differ between patients diagnosed with NAFLD or NASH compared to those with a diagnosis. Thus, we did not pursue further analyses to identify clinical features associated with CVD endpoints in NAFLD or NASH patients.

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