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New dietary tool to assess nutritional deficiencies in a NAFLD population: a simple tool for primary care. By C. Bredin[1], S. Naimimohasses[2], S. Norris[2, 4], C. Wright[3], K. Hart[1] and J.B. Moore[1,2]. [1]Department of Nutritional Sciences, University of Surrey, Guildford, Surrey, UK; [2]*Hepatology Department, St James' Hospital, Dublin, Ireland;* [3]Glenville Nutrition, Dublin, Ireland; [3]School of Food Science and Nutrition, University of Leeds, Leeds, UK; [4]Department of Clinical Medicine, Trinity College Dublin, Ireland.

BACKGROUND: Non-alcoholic fatty liver disease (NAFLD) is now the most common form of liver disease in the developed world. Strongly linked to obesity and poor nutrition, diets high in sugar and fat, and low in fruits and vegetables, are strongly implicated in NAFLD pathogenesis. However, many primary care and tertiary referral settings lack resources for comprehensive dietary assessment,. Therefore, the aims of this work were to validate a novel short food frequency questionnaire (SFFQ) designed to assess habitual intakes of food items related to NAFLD, in a cohort of Irish NAFLD patients.

METHODS: A 48-item SFFQ was designed emphasizing foods and nutrients implicated in NAFLD pathogenesis. Consenting, fibroscan-diagnosed, NAFLD patients were invited to complete the SFFQ during a 20-minute interview, and asked to complete a 4-Day Diet Diary (4DDD) at home for return by mail. Nutritional intakes were assessed utilizing the myFood24™ food composition dataset and estimated energy requirements (EER) were calculated using sex-, age- and weight-specific equations. Agreement between the dietary instruments was assessed by Spearman correlations and Bland-Altman plots.

RESULTS: Fifty-five patients completed both the SFFQ and the 4DDD; 42 (76%) were diagnosed with simple steatosis, whereas 13 (24%) had biopsy-proven steatohepatitis. The majority of participants were overweight or obese, with a median (25th; 75th percentile) BMI of 33.2kg/m^2 (29.3; 36.0). Reported energy intakes were well below EER with a median intake of 73% of requirements, suggesting widespread under-reporting. Highly significant, moderate to strong correlations were observed for sugar (r=0.45, P=0.0006), fat (r=0.46, P=0.0005), fruits (0.51, P=0.0001) and vegetables (r=0.40, P=0.0024). Bland-Altman plots demonstrated broad validity for the SFFQ, with no more than 3 measurements sitting external to the 95% agreement range for intakes of sugar, fat, fruits and vegetables. Sugar had a slight positive bias (4.6 g/day; Fig. 1).

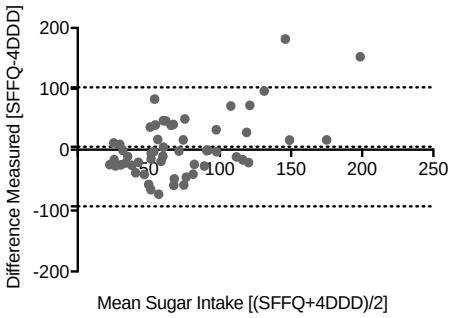

Fig. 1 Bland-Altman plot showing difference versus average for sugar intakes

CONCLUSION: We have developed and performed an initial validation of a novel SFFQ for dietary assessment in NAFLD patients. Further validation against clinical and urinary dietary biomarkers and in response to weight loss intervention is ongoing.

Development and initial validation of a short food frequency questionnaire for assessing dietary intakes of non-alcoholic fatty liver disease patients. By C. Bredin[1], S. Naimimohasses[2], S. Norris[2], C. Wright[3], K. Hart[1] and J.B. Moore[1,2]. [1]Department of Nutritional Sciences, University of Surrey, Guildford, Surrey, UK; [2]*Hepatology Department, St James'* Hospital, Dublin, Ireland; [3]Glenville Nutrition, Dublin, Ireland; [3]School of Food Science and Nutrition, University of Leeds, Leeds, UK.

Closely associated with obesity, non-alcoholic fatty liver disease (NAFLD) is now the most common form of liver disease in the developed world(1). Hyper-energetic diets containing high levels of saturated fat, refined carbohydrates and sugar sweetened beverages are strongly implicated in NAFLD pathogenesis, and dietary changes aimed at weight loss are the current mainstay of clinical management guidelines(2). However, many primary care and tertiary referral settings lack resources for comprehensive dietary assessment, which patients may also perceive as burdensome. Therefore, the aims of this work were to develop and validate a short food frequency questionnaire (SFFQ) specifically to assess habitual intakes of food items related to NAFLD.

A novel 48-item SFFQ was created using questions from previously validated instruments(3,4), emphasizing foods and nutrients implicated in NAFLD pathogenesis. Fibroscan-diagnosed NAFLD patients were recruited from St James' Hospital in Dublin, Ireland. Consenting patients underwent a 20-minute interview to complete the SFFQ and were asked to fill in a 4-Day Diet Diary (4DDD) at home for return by mail. Nutrient intakes were analysed using myFood24™ dietary analysis software. Estimated energy requirements (EER) for all participants were calculated using sex-, age- and weight-specific equations coupled with physical activity levels. Spearman correlations and Bland-Altman plots were used to assess the agreement between both instruments.

Fifty-five patients completed the SFFQ and the 4DDD; 96% of participants were overweight or obese, with a median (25th; 75th percentile) BMI of 33.2kg/m^2 (29.3; 36.0). Forty-two patients were diagnosed with simple steatosis, whereas 13 patients had biopsy-proven steatohepatitis. Dietary analyses showed intakes of saturated fat, total sugars, and sodium exceeded recommendations. Energy intakes were noted to be well below EER, with a median intake of 73% of requirements, suggesting under-reporting. Significant, fair to moderate, correlations were observed for sugar (r=0.32, P=0.0182), fat (r=0.46, P=0.0005), fruits (0.48, P=0.0002) and vegetables (r=0.40, P=0.0024). While both median difference and Bland-Altman analyses (**Fig 1**) showed an underestimation of sugar, fat, fruit, and vegetables by the SFFQ compared to the 4DDD, importantly, the Bland-Altman graphs demonstrate that the two methods are comparable, as no more than 3 readings sat external to the 95% agreement range.

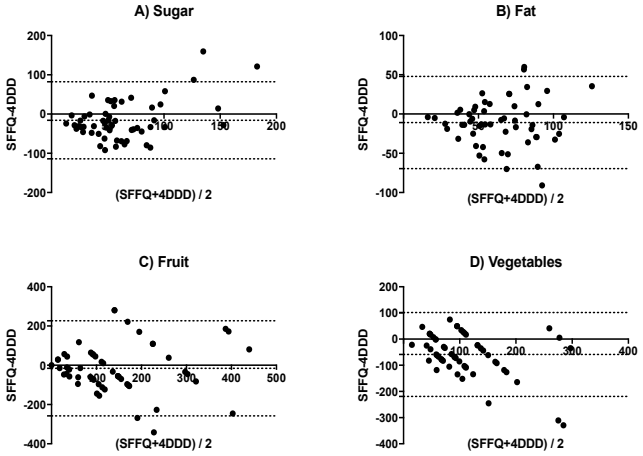

Fig 2. Bland-Altman plots showing difference vs average for A) Sugar B) Fat C) Fruit D) Vegetables

In conclusion, we have developed and performed an initial validation of a novel SFFQ for assessing dietary intakes in NAFLD patients. Ongoing work aims to iterate this instrument with further validation against urinary dietary biomarkers.

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