Editorial Commentary

A journey of a thousand miles begins with one small step

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Comment on: Keating SE, Sabag A, Hallsworth K, *et al*. Exercise in the Management of Metabolic-Associated Fatty Liver Disease (MAFLD) in Adults: A Position Statement from Exercise and Sport Science Australia. Sports Med 2023;53:2347-71.

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Liver disease associated with metabolic dysfunction now affects more than 30% of the world's population (1). Historically known as non-alcoholic fatty liver disease (NAFLD) is caused by obesity, lack of exercise, and a westernised lifestyle (2). To date, numerous attempts have been made to influence the steatohepatitis and liver fibrosis associated with metabolism-associated fatty liver disease (MAFLD) with medication. Nevertheless to date, no substance has been authorised for the indication NAFLD/MAFLD/metabolism-associated steatosis liver disease (MASLD) (3). It has long been known that a consistent change in lifestyle with a reduced diet and physical exercise is able to improve fatty liver disease, steatohepatitis, as well as liver fibrosis (4,5). The problem, however, is that only a small proportion of affected patients are able to achieve the necessary weight loss (5).

Physical training might reduce fatty degeneration of the liver and increase the effect of weight reduction on reducing inflammation (6). An improvement in the necroinflammatory process has not yet been proven. Determinations of liver fat using proton magnetic resonance spectroscopy (1H-MRS) show that aerobic training led to a decrease in hepatic fat content without a change in body weight (7). Meta-analyses also show that aerobic exercise and/or isometric training can improve transaminases and hepatic fat content in NAFLD patients, even independently of weight loss (8,9). Both training concepts are apparently equally effective (6,8,10).

When the energy balance was changed to the same extent by either a hypocaloric diet alone or a combination of a less restrictive diet and physical training, the participants in a systematic study each achieved the same weight loss (–10%) and the same improvement in transaminases, reduction in liver fat and improvement in insulin sensitivity (11). Both interventions are also effective on their own if the other variable—weight or physical activity—is kept constant. For example, aerobic training without changing body weight led to a decrease in hepatic fat content (12), as well as weight reduction under a hypocaloric low-carb or low-fat diet while maintaining an inactive sedentary lifestyle (13).

Resistance exercise may be more feasible than aerobic exercise for NAFLD patients with poor cardiorespiratory fitness (10). The combination of intermittent fasting with exercise reduces hepatic steatosis in patients with NAFLD, but may not provide additional benefit over fasting alone (14).

The review article of Keating *et al*. comes to the conclusion that resistance training should be considered in addition to, and not instead of, aerobic exercise targets for patients with metabolic dysfunction associated fatty liver disease (15). With a very high probability this position

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statement includes NALFD as well as MAFLD and especially MASLD. The new nomenclature with the new name MASLD (for NAFLD) was published shortly after this statement was finalized (3).

Under the auspices of the American Association for Study of Liver Disease (AASLD) and the European Association for Study of the Liver (EASL) in collaboration with the Asociación Latinoamericana para el Estudio del Hígado (ALEH), international experts (hepatologists, gastroenterologists, paediatricians, endocrinologists, hepatopathologists, public health and obesity experts, from industry and patient organisations) have now agreed on changes to the nomenclature and diagnostic criteria for fatty liver disease following a multi-stage modified Delphi process, which were presented worldwide in June 2023 during the International Liver Congress (EASL) in Vienna and are briefly summarised below. The new definition requires the presence of at least one cardiometabolic risk factor in addition to hepatic steatosis. This definition, which has been valid since 2023, therefore differs slightly from the MAFLD definition used by the Australian authors in (15). An analysis by the European Liver Investigation: Testing Marker Utility in Steatohepatitis (LITMUS) consortium showed that 98% of the existing registry cohort of patients with NAFLD would fulfil the new criteria for MASLD (3). In the North American National Health and Nutrition Examination Survey (NHANES) cohort and the national Swedish register, there is even a 99% match between the diagnoses of MASLD and NAFLD (16,17). It can therefore be assumed that the intersection of MAFLD and MASLD is also very large and remains irrelevant for the main message of this review article.

Keating *et al.* propose a holistic lifestyle approach to address fatty liver disease as well as co-morbidities. Their patient-centred multi-disciplinary team approach encompasses medical doctors, dietitians, psychologists, and physiotherapists in order to resolve and prevent MASLD as well as cardiovascular related comorbidity. There is a high level of scientific evidence in favour of this concept (4,5,18). The problem lies more in the practical implementation and consistency of the proposed concepts.

Taken together, the studies on which the position statement is based on show, that the apparently smallest effective dose for improving hepatic steatosis is 135 minutes of moderate-intensity aerobic physical activity per week. Increasing the intensity showed no additional effects (15). It is possible that people with more severe metabolic disorders and more pronounced hepatic steatosis might achieve a reduction in hepatic steatosis through resistance training alone. However, no comparisons of the dose of resistance training or the efficacy and safety of corresponding training protocols have been conducted outside of laboratory conditions in people with MAFLD (15). Combining aerobic and anaerobic exercise seems to be the golden path to especially to maintain/limit losses in lean muscle mass during weight loss and to elicit a range of other functional and cardiometabolic benefits. Behaviour change techniques, e.g., self-monitoring and monitoring of outcomes (e.g., waist circumference), and/or behaviours (e.g., via a pedometer, smartwatch) and repeated discussions with healthcare professionals are required. Support networks within a community, the social and family group can facilitate personal responsibility (15). However, it should not be forgotten that there are a number of limitations to this holistic and ideal therapeutic approach. In addition to the high consumption of resources, these include declining motivation, high co-morbidity and the—sometimes—low socio-economic status of patients.

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