

Background and Aims: Frailty is very common in end-stage liver disease, regardless of disease etiology, and has a significant impact on clinical outcome and quality of life, due to impaired skeletal muscle function, quality and quantity. However, there are few data available on the relationship between liver and skeletal muscle, especially in patients with earlier disease stages. Our aims are to evaluate the prevalence of frailty in a prospective cohort of patients with metabolic-dysfunction associated fatty liver disease (MAFLD) according to its severity.

Method: Patients with MAFLD were recruited in a prospective single-center cohort study. Epidemiological, clinical, biological and anthropometric data were collected. All patients underwent a noninvasive assessment for frailty screening, including a dominant hand grip strength test, a balance test, and the time required to do five times sit to stand to calculate the liver frailty index (LFI). The severity of MAFLD was assessed by the fatty liver index (FLI), fibrosis 4 (FIB-4) index, and by transient elastography (elasticity and controlled attenuation parameter).

Results: 92 patients with MAFLD were recruited, including 44 men (47.8 %) and 44 patients with type 2 diabetes (47.8 %). Mean age was 55 years (19-78), mean BMI was 32.7 kg/m² (23.9 - 47.5) and mean HOMA-IR was 7.6 (0.5-30.1). Regarding the severity of MAFLD, the mean elasticity was 6.45 KPa (3.1 - 35) and the mean FIB-4 score was 1.33 (0.31 - 5.61). The mean FLI was 85.1 (28-100) and the mean controlled attenuation parameter (CAP) was 332.3 dB/m (207-400). Regarding frailty parameters, the mean dominant grip strength was 31 kg (8 - 62), the mean time to do five chair stands was 8.2 seconds (4.25 - 24.25), the mean balance test score was 9.9 seconds (2.1 - 10) and the mean LFI was 2.98 (1.13 - 4.71). 51 patients had an LFI score < 3 (robust group, 56 %), 36 had a score between 3 and 4.5 (pre-frail group, 39.6 %), and 4 had a score greater than 4.5 (frail group, 4.4 %). No correlation was observed between the degree of steatosis (assessed by the FLI or CAP values) and frailty. In contrast, a significant increase in the level of frailty is observed in patients with type 2 diabetes ($p = 0.03$) and with a high liver elasticity compatible with an F4 stage (mean LFI: 3.7 vs 2.9, $p = 0.0078$) (Figure), independent of age. Frailty is also significantly higher according to the FIB-4 index with a mean LFI of 3.72 in case of FIB-4 > 2.67 vs 2.8 in case of FIB-4 < 1.3 ($p = 0.042$) (Figure).

Conclusion: 44% of MAFLD patients already have a frail or pre-frail status regardless of age. This reduction of strength is associated with the presence of diabetes and the severity of MAFLD in terms of fibrosis. Further research is needed to determine the cause of this frailty and its potential impact on liver disease severity and prognosis.

Figure:

