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Exploring the link between handgrip strength and MASLD

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Background and aims: Handgrip strength (HGS) is a surrogate marker for whole-body muscle strength. Metabolic dysfunction-associated steatotic liver disease (MASLD) is closely linked with obesity, insulin resistance, and sarcopenia. This study aimed to investigate the relationship between HGS and markers of liver steatosis and fibrosis in an MASLD population.

Method: Cross-sectional cohort studies were conducted from 2019 to 2023 across primary care practices in Belgium and the Netherlands, and a hospital endocrinology department in Belgium. Presence of fibrosis was defined by a Vibration Controlled Transient Elastography (VCTETM, i.e., liver stiffness) cut-off value of >8 kPa, and steatosis (hence MASLD) by a Controlled Attenuation Parameter (CAPTM) cut-off value of >275 dB/m (FibroScan[®], Echosens, Paris). HGS was assessed using a hydraulic hand dynamometer (JAMAR, Saehan, Korea) and categorized into low, average, or high based on normative data. Spearman correlation and logistic regression analyses were conducted to assess associations between absolute HGS, bHGS (absolute HGS/BMI), hHGS (absolute HGS/height), VCTE, and CAP. **Results:** In this cross-sectional study, 422 participants were included. MASLD was present in 264 (62.5%) of participants, of whom 193 (45.7%) were male and 57 (13.5%) had fibrosis. The median age and BMI were 61 [IQR 16] years and 28.1 [IQR 6.2] kg/m², respectively. bHGS was significantly lower in the MASLD group (1.0 [IQR 0.6] vs. 1.2 [IQR 0.6], $p < 0.001$), while absolute HGS and hHGS did not differ. bHGS, but not absolute and hHGS, was inversely correlated with CAP ($r = -0.149$, $p = 0.015$) in the MASLD group. In women, absolute, bHGS, and hHGS were significantly lower in individuals with fibrosis compared to those without fibrosis. Multivariable logistic regression models adjusted for age, sex, smoking, alcohol, BMI, T2DM, and exercise indicated that there were no statistically significant

associations between absolute HGS, bHGS, and hHGS and the presence of steatosis.

Conclusion: bHGS was associated, but not independently, with steatosis severity. Given the intrinsic relationship between BMI and steatosis, bHGS may not reflect an independent muscle–liver link. Absolute HGS and hHGS showed no independent relationship with steatosis or fibrosis in this MASLD cohort. Standardization of HGS normalization methods and larger longitudinal studies are needed to clarify its role in MASLD risk assessment.