The role of FibroScan in the era of metabolic (dysfunction)-associated fatty liver disease

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Among chronic liver conditions, metabolic (dysfunction)-associated fatty liver disease (MAFLD) ranks as the most frequent. With a worldwide prevalence of 37%, the global

burden of MAFLD is large and growing (1). Approximately 45% of the Turkish population meets the diagnostic criteria for MAFLD (2), which are based on detection of liver steatosis by imaging techniques, blood biomarkers or non-invasive scores, or by liver histology in addition to one of the following three criteria: overweigh or obesity, presence of type 2 diabetes, or evidence of metabolic dysregulation (3).

After diagnosis, the clinical trajectory of patients with MAFLD is a long-life journey that starts from triaging the severity of liver disease to the implementation of treatment and follow-up surveillance. Being the key prognostic determinant, timely detection and accurate staging of hepatic fibrosis is vital for prioritizing treatment and improving outcomes (4). According to current guidelines, this overarching goal should be achieved through a stepwise approach aimed at increasing the diagnostic and predictive certainty. Specifically, the first step is based on the use of simple compound surrogates calculated from routine clinical and laboratory parameters – including the fibrosis-4 index (FIB-4) and non-alcoholic fatty liver disease (NAFLD) fibrosis score (NFS). This should be followed by second-line FibroScan examinations whenever patients are classified at high or intermediate risk of advanced fibrosis during the preceding step (5, 6). This approach is expected to avoid unnecessary liver biopsies – ultimately reducing the economic burden of MAFLD on healthcare systems (7, 8).

Given the key role played by overweight or obesity in the pathogenesis of MAFLD, the concomitant presence of the two conditions poses special challenges. A recent meta-analysis involving more than two million subjects from the general population reported that approximately 50% of those being overweight or obese met the diagnostic criteria for MAFLD (9). Considering that obesity is a risk factor for the development of advanced fibrosis, there is an urgent need to improve early detection and diagnosis of this condition in the obese population (10). Currently, FibroScan parameters are among the best established imaging biomarkers of hepatic fibrosis and steatosis (11). However, there are some

methodological issues to be considered when FibroScan is performed in obese individuals. Due to the increased distance between the skin and liver capsule, the examination should be conducted with a specific XL probe. This approach is valuable as it allows successful measurements in up to 97% of cases, although some operator-dependent differences still exist (12, 13).

Owing to its widespread availability and low costs, abdominal ultrasonography remains the most extensively used imaging modality for the identification of hepatic steatosis in patients with MAFLD (14). However, its clinical value in the detection of mild-to-moderate steatosis (< 30%) is limited and more sensitive methods – including controlled attenuation parameter obtained from FibroScan – should be recommended (15). Another advantage of FibroScan over abdominal ultrasonography is that information concerning both steatosis and fibrosis can be simultaneously obtained. Finally, FibroScan data have high agreement with liver biopsy findings across different fibrosis stages (16, 17).

Although advanced fibrosis is the most robust prognostic determinant of liver-related, cardiovascular, and overall mortality (4), clinical outcomes in MAFLD can also be affected by patient age and type 2 diabetes mellitus (18). In addition, while FibroScan data are considered among the best standards in the field of non-invasive hepatic diagnostics, the presence of potential bias and confounders (e.g., obesity and operator experience) is fairly common in the clinical setting. In this scenario, models combining both clinical and FibroScan variables are expected to outperform FibroScan alone in the prediction of fibrosis. Among them, Agile 3+ and Agile 4 have been developed for optimizing the identification of advanced fibrosis and cirrhosis, respectively (19). These scoring systems – wherein liver stiffness measurements are combined with clinical and laboratory parameters (e.g., age, sex, alanine transaminase, aspartate transaminase, platelet count, and diabetes status) – have been recently shown to reflect health-related quality of life in patients with NAFLD (20).

In conclusion, the detection of hepatic fibrosis and steatosis by means of FibroScan bears great relevance in the clinical management of patients with MAFLD. According to recently proposed guidelines, this non-invasive imaging modality ought to play an important supportive role with respect to prognostic stratification. Using a combination of liver stiffness measurements and clinical parameters, recent studies have also been able to devise and validate refined prognostic scores that may be applied to patients in need of close surveillance protocols.

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