Letter to the Editor

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The Novel Metabolic Bridges Extending from Liver to the Bone: The Liver-Bone Axis

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To the editor,

We read with great interest the article by Ayyildiz et al. (1). We believe this study is valuable in terms of investigating the role of non-alcoholic fatty liver disease (NAFLD) in osteoporosis clinical practice. However, we have several suggestions to strengthen the study.

In this study, the presence of advanced hepatic steatosis was determined by ultrasonography, which has several limitations. Ultrasonography provides a subjective classification that depends on the evaluator and is, therefore, not recommended for grading hepatic steatosis in international NAFLD guidelines. Furthermore, in NAFLD, the severity of steatohepatitis and fibrosis, rather than the mere presence of steatosis, is more important for clinical progression (2). It is recommended that fibrosis risk assessment be performed to determine the clinical course, particularly when evaluating disease severity. In addition, international guidelines recommend that fibrosis risk be determined primarily by the Fibrosis-4 score and that further investigation be carried out in high-risk individuals (2). In light of these data, we believe that comparing patients with and without NAFLD within the current patient cohort, and subsequently evaluating individuals with NAFLD according to their fibrosis levels, will increase the study's power (3).

Secondly, the presence of steatosis in patients with NAFLD is directly related to metabolic syndrome and associated diseases. Many metabolic disorders, primarily obesity and type 2 diabetes mellitus (T2DM), increase the severity of hepatic steatosis during the progression of NAFLD (4). Furthermore, obesity and diabetes mellitus are known to be associated with the development and progression of osteoporosis. These clinical data demonstrate that multiple metabolic disorders affect the severity of osteoporosis; therefore, examining the direct impact of these diseases is important (4). The present study did not investigate the relationship between obesity, T2DM, and clinical outcomes among the patient groups. Therefore, it could not be determined whether the current results are attributable to NAFLD itself or to NAFLD-related obesity and T2DM (5). We believe that the clinical evaluation of obesity and diabetes mellitus, which are directly related to both osteoporosis and NAFLD, will increase the study's statistical power.

Lastly, osteoporosis is a multisystem disease resulting from interactions among multiple factors. Predisposing factors such as smoking, long-term use of glucocorticoids, body weight, and physical activity levels are important in the development and progression of osteoporosis (5). However, the effects of these factors were not evaluated in the clinical analysis comparing the groups in the present study. We believe that examining the relationship between these predisposing factors especially body weight and smoking and clinical disease severity, and comparing these data with the presence of NAFLD, will increase the study's power.

In summary, the relationship between NAFLD and osteoporosis is not fully understood, and clinical evaluation based on the presence of steatosis and fibrosis is critically important. Additionally, factors such as obesity, T2DM, smoking, and physical activity should be considered to better elucidate this relationship.

Footnotes

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References

1. Ayyildiz A, Ciftci Inceoglu S, Alkim C, Kuran B. Impact of the severity of steatosis due to non-alcoholic fatty liver disease on bone mineral density in patients with osteoporosis. Med Bull Haseki. 2025;63:252-7.
2. European Association for the Study of the Liver (EASL); European Association for the Study of Diabetes (EASD); European Association for the Study of Obesity (EASO). EASL-EASD-EASO Clinical Practice Guidelines on the management of metabolic dysfunction-associated steatotic liver disease (MASLD). J Hepatol. 2024;81:492-542.
3. Barchetta I, Lubrano C, Cimini FA, et al. Liver fibrosis is associated with impaired bone mineralization and microstructure in obese individuals with non-alcoholic fatty liver disease. Hepatol Int. 2023;17:357-66.
4. Kirik A, Sumbul HE, Koca N, et al. Prevalence of MASLD and fibrosis risk in Turkish adults with cardiometabolic risk factors: a nationwide multicenter study (DAHUDER MASLD Study). J Clin Med. 2025;14:7098.
5. Ali D, Tencerova M, Figeac F, Kassem M, Jafari A. The pathophysiology of osteoporosis in obesity and type 2 diabetes in aging women and men: the mechanisms and roles of increased bone marrow adiposity. Front Endocrinol (Lausanne). 2022;13:981487.