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Enhancing the Predictive Utility of MHR for Senile Osteoporosis: Unaddressed Considerations and Future Directions [Letter]

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Dear editor

We have read with great interest the article by Lin et al discussing the predictive value of the monocyte-to-high-density lipoprotein cholesterol ratio (MHR) for senile osteoporosis.[1] The study is timely and provides valuable insights into a cost-effective biomarker with potential applications in primary healthcare settings. However, I would like to highlight some additional limitations and offer suggestions for future research directions that may enhance the robustness of the findings.

First, the study's reliance on a single biomarker, the MHR, may limit its predictive utility for osteoporosis in older adults. While the results demonstrated a statistically significant association, the sensitivity and specificity reported (73.5% and 59.9%, respectively) suggest that MHR alone may not be sufficient for clinical decision-making. A composite biomarker panel incorporating other inflammatory or metabolic markers, such as C-reactive protein or vitamin D levels, might improve diagnostic accuracy. Future studies could explore such multidimensional approaches to refine risk prediction models.

Second, although the authors adjusted for various confounders, the role of lifestyle factors such as physical activity, diet, smoking, and alcohol consumption was not addressed.[2–4] These factors are well-established contributors to bone health and could influence both MHR levels and osteoporosis risk. Including these variables in future analyses may provide a more comprehensive understanding of the relationship between MHR and bone density.

Another consideration is the potential variability in MHR cut-off values across populations with different genetic, dietary, or environmental backgrounds. The cut-off value identified in this study (0.308×10□/mmol) may not generalize to other demographic groups. Multi-center and cross-population studies are necessary to validate and standardize MHR thresholds for broader clinical application.

Moreover, while the study focused on bone mineral density (BMD) as the primary diagnostic criterion for osteoporosis, other parameters such as bone microarchitecture or bone turnover markers could provide additional insight into the disease's progression.[5] Dual-energy X-ray absorptiometry (DXA), though widely used, does not fully capture bone quality. Incorporating advanced imaging techniques like high-resolution peripheral quantitative computed tomography (HR-pQCT) in future studies could offer a more nuanced assessment of bone health.

Finally, the inclusion of centenarians is a commendable feature of this study, yet it also raises the question of survivorship bias. Individuals reaching advanced age may have inherently different biological profiles, potentially confounding the relationship between MHR and osteoporosis. Stratified analyses by age group or frailty index could mitigate this limitation.

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In conclusion, while Lin et al's study provides an important foundation for MHR as a predictor of senile osteoporosis, addressing these additional aspects will further enhance the clinical relevance and generalizability of their findings. We look forward to future research that builds upon these promising initial results.

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