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Lipoprotein(a): The Silent Actor That Hardens the Arteries and Weakens the Bone

Lipoprotein(a): Arterleri Sertleştiren ve Kemikleri Zayıflatan Sessiz Aktör

LETTER TO THE EDITOR
EDİTÖRE MEKTUP

To the Editor,

The study by Yurtseven et al.[1] represents an important step toward understanding the vascular–skeletal interplay through the lens of lipoprotein(a) [Lp(a)]. Their findings suggest that elevated Lp(a) levels parallel two seemingly opposite processes (vascular calcification and bone demineralization) inviting a deeper look at the molecular symmetry underlying this phenomenon.

While the authors have made a valuable contribution, several aspects deserve further consideration. The visual assessment of coronary artery calcification, rather than quantitative Agatston scoring, may limit reproducibility and comparability across cohorts.[2] In addition, prior population data linking coronary calcium and thoracic vertebral bone mineral density (BMD) further underline the vascular–skeletal continuum that the present study seeks to illuminate. Furthermore, key modulators of bone metabolism such as menopausal status, estrogen, and vitamin D levels were not incorporated into the analysis; integrating these factors could refine the clinical interpretability of Lp(a)-related bone–vascular interactions.[3,4]

Beyond these methodological nuances, the concurrent increase in coronary calcification and reduction in bone density across Lp(a) strata may not be a mere coincidence but rather the manifestation of a shared molecular paradox—a "calcify-and-resorb" signal driven by the same lipoprotein particle. Lp(a) carries oxidized phospholipids that can activate Runt-related transcription factor 2 (RUNX2) and bone morphogenetic protein 2 (BMP-2)-mediated osteogenic differentiation in vascular smooth muscle cells, while simultaneously promoting osteoclastic bone resorption via pro-inflammatory cytokine pathways.[5,6] Structurally, Lp(a) shares a high degree of homology with plasminogen, particularly within its Kringle IV and V domains, which may partly explain its ability to modulate osteoclast activity through plasminogen-like pathways.[6] This dualistic mechanism positions Lp(a) as a metabolic crossroads molecule, silently orchestrating mineral deposition in arteries and depletion in bone. Such opposing biological symmetry raises a provocative question: could Lp(a) represent the biochemical thread uniting atherosclerosis, aortic valve stenosis, and osteoporosis?

Although measurable for decades, Lp(a) has long remained overshadowed by traditional lipids. Recent studies have repositioned it as a "silent but potent actor" in both atherosclerosis and vascular calcification.[7] The work by Yurtseven et al.[1] extends this narrative to the skeletal domain, potentially redefining Lp(a) as a systemic regulator of mineral homeostasis.

Future translational studies that integrate serial Lp(a) measurements with bone turnover markers and micro-computed tomography (micro-CT) imaging may determine whether this molecule is merely a passive bystander or the molecular conductor of the vascular–skeletal symphony.

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