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LETTER TO THE EDITOR

Statins as potential agents for the prevention and treatment of osteoporosis

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We read with interest the article entitled "Comparative impact of systemic delivery of atorvastatin, simvastatin, and lovastatin on bone mineral density of the ovariectomized rats" which was recently published by Shahrezaee and co-workers [1]. In this study, oral treatment with simvastatin (25 mg/kg/day), and lovastatin (20 mg/kg/ day) for 60 days significantly increased serum calcium level, expression of osteogenic genes, trabecular bone mineral density (BMD), the bone volume/total volume, and bone thickness in ovariectomized (OVX) rats. Both biomechanical parameters, ultimate load and stiffness, in femur and vertebra were significantly improved only by simvastatin versus the OVX group.

However, protective effects of statins against osteoporosis should not be underestimated. We recently reported that in healthy female rats, orally administered rosuvastatin, atorvastatin, and simvastatin (20 and 40 mg/kg) for three weeks did not change bone mineral density, T scores and tibia lengths but significantly improved biomechanical properties (ultimate tensile strength, elastic modulus, and yield force) of tibia specimens even within this relatively shorter treatment period [2]. Bone fragility is not solely dependent on bone mass; improved bone strength is associated with enhanced bone turnover which may be supported by higher statin doses [2]. If Shahrezaee and co-workers had utilized a wider dose range, they would have been able to efficiently compare the anti-osteoporotic effects of statins in OVX rats. In line with our experimental data, a recent population-based cohort study reported that high (rosuvastatin and atorvastatin) and moderate potency (simvastatin) statins more effectively reduced the risk of new-onset osteoporosis [3].

As presented by the experimental and clinical data on healthy bones, statins require attention as potential agents not only for the treatment but also for the prevention of osteoporosis.

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Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

References

1. M. Shahrezaee, A. Oryan, F. Bastami, S. Hosseinpour, M.H. Shahrezaee, A. Kamali, Comparative impact of systemic delivery of atorvastatin, simvastatin, and lovastatin on bone mineral density of the ovariectomized rats. Endocrine **60**(1), 138–150 (2018)
2. F. Kaleağasıoğlu, E. Olcay, V. Olgaç, Statin-induced calcific Achilles tendinopathy in rats: comparison of biomechanical and histopathological effects of simvastatin, atorvastatin and rosuvastatin. Knee. Surg. Sports Traumatol. Arthrosc. **25**(6), 1884–1891 (2017)
3. T.K. Lin, P. Chou, C.H. Lin, Y.J. Hung, G.P. Jong, Long-term effect of statins on the risk of new-onset osteoporosis: a nationwide population-based cohort study. PLoS One **13**(5), e0196713 (2018)

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