



Answer to the letter to the editor of Zhe Wang et al. concerning "Comparison of cervical, thoracic, and lumbar vertebral bone quality scores for increased utility of bone mineral density screening" by Razzouk J, Ramos O, Ouro-Rodrigues E, et al. [Eur Spine J (2022): doi:10.1007/s00586-022-07484-5]

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To the Editor,

We thank the respondent for their knowledgeable commentary on our study. Certainly, the article by Huang et al. is a valuable contribution to the literature that further advances our understanding of the still nascent cervical VBQ score [1]. We agree that several factors need to be considered when comparing the two articles given their distinct study designs [1, 2]. While Huang et al. compared cervical VBQ to DEXA T-scores, our article had a very different methodology that did not include evaluating DEXA T-score of the hip but rather evaluated the correlation of the cervical VBQ to lumbar and thoracic VBQ. Therefore, a direct comparison between these studies and their results cannot be made. The conclusion of our study was that while thoracic VBQ demonstrated a moderate correlation to lumbar VBQ, cervical VBQ had a low correlation to both thoracic and lumbar VBQ. As the respondent points out, the VBQ in these areas appears to have their own cutoff values. The conclusion of the referenced study was that cervical VBQ scores were significantly correlated with DEXA T-score. Again, both studies had different methodologies, results, and conclusions.

Further study is required to ascertain the full potential of MRI-based VBQ scoring. In our article, we emphasize that while the study attempts to lay a foundation for cervical VBQ, more research will be required to fine-tune optimized guidelines for its calculation. Until further research is conducted, it is still premature to make claims that any particular methodology of cervical VBQ calculation is superior.

For instance, while the Huang et al. method of measuring the upper T1-level CSF may offer advantage with respect to avoiding the *intumescentia cervicalis*, measuring C2 may not be ideal given its markedly different anatomy and biomechanical loading as compared to the lower cervical vertebrae. Likewise, it is possible that measuring the C3–C6 vertebrae is not the most optimized method for VBQ calculation. Both articles propose logical methodologies, though there remains a lack of scientific backing to reasonably suggest one methodology should be favored over the other at this time.

Altogether, it is important to keep in mind that the respective findings of Razzouk et al. and Huang et al. are not mutually exclusive, and both articles spark opportunities for future research to continue advancing cervical VBQ. It should be emphasized that the scientific community has a responsibility to ensure that the development of cervical VBQ is crafted methodically with rigor, scrutiny, and diligence to avoid spurious conclusions. Nevertheless, utilizing the simple VBQ calculation for a range of applications is a surely exciting prospect to explore.

References

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2. Razzouk J, Ramos O, Ouro-Rodrigues E et al (2022) Comparison of cervical, thoracic, and lumbar vertebral bone quality scores for increased utility of bone mineral density screening. *Eur Spine J*. Published online December 13, 2022. <https://doi.org/10.1007/s00586-022-07484-5>

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