DXA ERROR INFLUENCE ON THE ASSESSMENT OF A NOVEL ECHOGRAPHIC APPROACH TO OSTEOPOROSIS DIAGNOSIS ON THE SPINE

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Objective: To assess the actual performance of Osteoporosis Score (OS), a recently introduced ultrasound (US) parameter for osteoporosis diagnosis on lumbar spine.
Materials and Methods: In a previous study, we directly assumed the outcome of DXA investigations asthe gold standard reference to assess the OS diagnostic performance in a population of 384 patients aged in 45–65 years, obtaining an overall accuracy of 84.6 % in patient classification (osteoporotic, osteopenic, or healthy) coupled with a good correlation between DXA- measured BMD and corresponding OSderived values ($r=0.72$, $p<0.0001$) [1]. In the present work, we performed a retrospective check of the 384 DXA reports, excluding all those cases presenting a typical DXA error as identified by recent literature (e.g., patient positioning, presenceofartefacts,etc.)[2]andreassessingtheactualdiagnostic accuracy of our US approach by considering only those patients having a reliable DXA report.
Results: 159 patients out of the initial 384 (41.4 %) were excluded because of clear DXA pitfalls. The overall agreement between DXA and OS-based diagnoses on the remaining 225 patients was 93.5 % ($r=0.81$, $p<0.0001$), without appreciable variations as a function of patient age, showing that undetected DXA errors had resulted in a significant underestimation of OS accuracy in our previous study.
Conclusions: The actual potential of the OS-based approach for osteoporosis diagnosis was previously underestimated. Furthermore, the adopted method for DXA report analysis could be used to reassess the performance of different US methods thatassumed routine DXA investigationsasthe gold standard reference.

References:

1. Casciaro et al., Proc 2015 I.E. Int Symp Med Meas Appl (MeMeA), pp. 250–254.
2. Messina et al., Eur Radiol 2015;25:15041.

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