

Non-Invasive Assessment of Equine Bone: An Update

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Abstract

This paper summarizes traditional and current methods of non-invasive assessment of bone in the horse. The description and potential clinical utility of two non-invasive technologies with major development in the last decade are presented, namely, (1) serum biochemical markers for bone turnover and (2) quantitative ultrasound. Serum biochemical markers of bone formation valid in horses are osteocalcin, carboxy-terminal peptide of type I procollagen and bone-specific alkaline phosphatase. The cross-linked carboxy-terminal telopeptide of type I collagen c-telopeptides of type I collagen and total deoxypyridinoline are the serum markers for bone degradation. These markers respond more rapidly to skeletal changes than other bone assessment techniques, but ideally each horse needs to be compared with itself. Quantitative ultrasound is radiation free and is a well-tolerated technique for measuring bone properties in horses. This device allows bone speed of sound measurements at various sites using the axial transmission mode along the cortex and gives information about stiffness, architecture, porosity and bone mass.

A combination of different non-invasive assessment techniques is recommended for the evaluation of bone biphasic modelling-remodelling activity and the mineral phase with its architecture. The potential clinical and research use of these techniques is considered.