Comparison of Bone Scintigraphy and Standing $^{18}$F-NaF Positron Emission Tomography for Imaging of the Fetlock in Thoroughbred Racehorses

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Positron emission tomography (PET) imaging had a higher interobserver agreement than scintigraphy for assessment of the racehorse fetlock and detected additional abnormalities, in particular in the proximal sesamoid bones. Authors’ addresses: School of Veterinary Medicine, University of California, Davis, One Shields Avenue, Davis, CA 95616 (Spriet, Arndt, Pige, Pye); Southern California Equine Foundation, 285 West Huntington Drive, Arcadia, CA 91007 (O’Brion); Equine Medical Center, PO Box 1491, Sierra Madre, CA 91025 (Carpenter); von Bluecher, Blea & Hunkin, Inc., 282 West Sierra Madre Blvd, Sierra Madre, CA 91024 (Blea); 400 Harvard Drive, Arcadia, CA 91007-2638 (Dowd); e-mail: mspriet@ucdavis.edu. *Corresponding and presenting author. © 2021 AAEP.

1. Introduction

A positron emission tomography (PET) scanner, specifically designed for use in standing, sedated horses has recently been introduced. The goal of this study was to compare the ability of standing PET to bone scintigraphy for the detection of abnormalities in the fetlocks of Thoroughbred racehorses.

2. Materials and Methods

Thirty-three horses (72 fetlocks) imaged with both PET and scintigraphy for investigation of lameness or performance issues were included in this study. Seven observers, including experienced racetrack practitioners and radiologists, independently reviewed all data for evidence of increased radiopharmaceutical uptake in 10 different regions of interest.

3. Results

The interobserver agreement was higher for PET (Kappa-weighted (K-w) 0.73 (0.51-0.84)) (median range) than for scintigraphy (0.61 (0.40-0.77)) (P < 0.0001). When scintigraphy and PET were compared, the agreement was only fair (K-w 0.29). Agreement between the two modalities

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NOTES
was higher for the palmar condylar regions (K-w 0.59) than for the proximal sesamoid bones (K-w 0.25). PET detected abnormalities in 23/144 (16.0%) of proximal sesamoid bones, whereas scintigraphy detected abnormalities in only 4/144 (2.8%).

4. Discussion
The high interobserver agreement for PET, despite the recent introduction of this technique, demonstrates the ease of clinical interpretation of PET scans. The higher number of lesions detected with PET compared with scintigraphy may be explained by the cross-sectional nature and higher spatial resolution of PET imaging.

Acknowledgments
This study was funded by the Dolly Green Research Foundation with support from the Stronach Group, and by the Grayson Jockey Club Research Foundation.

Declaration of Ethics
The Authors have adhered to the Principles of Veterinary Medical Ethics of the AVMA.

Conflict of Interest
The Authors have no conflicts of interest.