A SMALLER DISTAL RADIUS WIDTH TO HEIGHT RATIO IS NOT ASSOCIATED WITH FRAGILITY FRACTURES

Presenter: Fred R.T. Nelson, MD
Authors: Fred R.T. Nelson, MD; Ali Omari, BS; Elizabeth King, MD

Purpose: Based on the concept that “smaller boned” people may be more prone to fracture we investigated the distal radius width relative to height as a marker of fracture risk. Our hypothesis was that a smaller width to height ratio would be associated with fragility fracture of the distal radius.

Methods: Patients between ages 40 to 70 were assessed for low energy fractures of the distal radius (fall from a standing height) wherein comminution and radiograph projection would not interfere with measures. The ulnar aspect of the radio dense radial subchondral sclerotic line was measure to both the distal tip of the radius articular surface and the estimated transverse radial diameter. Demographics were obtained for these patients and 84 sex and age matched non-fracture patients were selected for those with radiographs for non-fracture conditions. The principal investigator reviewed inclusion and exclusion criteria and provided confirmation of the diagnosis. Patient’s height, weight, age, and sex were also obtained. We repeated this for our control non-fracture patients that met the same enrollment criteria.

Results: For fractures the average distal radius articular width to height ratio was 17.8 mm/M and the transverse width/height ratio was 18.3. For non-fractures the ratios were 17.5 and 17.8 respectively. The calculated body height to distal radius diameter ratio was not significantly different between the fracture and the non-fracture group.

Discussion: This negative result allows us to exclude the body height to distal radius diameter ratio measure from fragility fracture prediction. The FRAX score allows physicians to determine risk for fragility fracture based on history and demographics. The greater a patient’s score, the greater the risk of fracture. Bone mineral density is a part of that score. However, patients often understate tobacco and alcohol which are elements of the FRAX score. A height to distal radius diameter ratio, if associated with fragility fracture, would have been an additional objective tool to detect a patients’ risk for fragility fracture. There remains there need to develop tools to increase the accuracy of the FRAX score.