ABSTRACT

Objective: A commercially available dual energy X-ray absorptiometry scanner normally provides more than 1 scan mode. The differences between scan modes affect scan time, received radiation dose, and quality of the scan image. A phantom study was performed to evaluate the performance of different scan modes for anterior-posterior spine scan.

Patients and Methods: To measure the entrance skin exposure, an ionization chamber was placed on the scanning table in the central region. For a QDR Delphi dual energy X-ray absorptiometry scanner, 4 scan modes were available for spine study.

Results: The fastest scan mode, turbo mode, was found to produce underestimated results for total area of the vertebrae (~1%), bone mineral content (~7%), and bone mineral density (~6%). In contrast, the slowest scan mode, high definition mode, was found to produce overestimated bone mineral content (~3%) and bone mineral density (~2%). The results from the default fast array scan mode and the remaining array scan mode were found to be accurate and no significant difference was found between them.

Conclusion: Since the fast array scan mode required 50% less scan time and the measured entrance skin dose was also approximately 50% less than the array scan mode, the fast array mode is considered to be the choice for routine clinical spine studies. The turbo scan mode should only be used as an aid in positioning the patient prior to performing a scan.

Key Words: Bone density, Scan