ABSTRACT

The accuracy of CT number and its linearity are important parameters in computed tomography (CT) image quality, both parameters can depend on the number of detector arrays and scanner age. The purpose of this study was to obtain the relationship between CT number linearity with the number of detector arrays and scanner age and to determine the characteristics of CT numbers at various vendors against material variations in ACR phantoms. This study used an accredited ACR 464 CT phantom. The phantom was scanned with 55 different scanners from various vendors. CT numbers of different materials and their linearity were automatically measured using IndoQCT software from the phantom images. The regression coefficient (R) was obtained from the graph of CT number versus material density. Information regarding the number of detector arrays from 2 to 128 slices and the age of the scanners from 1 to 12 years, determined from the commissioning date was obtained from the Medical Physicist at each CT center. It was found that 6 out of 55 scanners had a linearity CT number lower than 0.99. These CT scanners with substandard R values had detector array numbers of 16 and 32 slices, and had scanner ages of 1, 3, 4, and 5 years. The accuracy of the CT number and its linearity are independent of the number of detector arrays and scanner age.

***Keywords** : CT-scan, CT Number, ACR Phantom*