

ABSTRACT

The usage of Computed Tomography Dose Index Volume (CTDI_{vol}) as a exam parameter has the disadvantage of not being suitable for wide-beam Computed Tomography's (CT) and is only the output dose of the device. Thus, a new metric Size-Specific Dose Estimates (SSDE) was introduced to more accurately represent the dose received by the patient. Diagnostic Reference Level (DRL) based on body anatomy and clinical indications have the disadvantage of producing high dose variation. Therefore, a DRL that produces lower dose variation and is clinically applicable is needed. The goal of this study was to establish and compare local DRL for head CT examinations using data acquisition protocol and SSDE at the Indriati Hospital Solo Baru. This study was conducted by collecting data on patient who underwent non contrast head CT exam within the period from January to December 2023. Types of protocols widely used in non contrast adult head CT examinations in 2023 were protocols of 1.1 (routine axial head), 1.14 (helical head) and 1.9 (helical head fast scan). Data of scan parameters were obtained from Digital Imaging and Communications in Medicine (DICOM) files of patient CT images. The dose calculations and diameters were calculated from the patient's CT image using the IndoseCT 20b software. The DRL's result was compared to Indonesian DRL and values from other countries. This research pointed out that local DRLs in Indriati Hospital was higher than values in Indonesia (National), USA, Saudi Arabia, Thailand, France and American College of Radiology (ACR) studies. This finding suggest that it is still important to optimize protocols in the future. The established local DRL values can be used as a tool for optimization. It is important to educate the medical personnel involved to implement the optimization to avoid an excessive dose in the head CT examinations.

Keyword : CT Optimization, Diagnostic Reference Level (DRL), Protocol DRL, CTDI_{vol}, DLP, SSDE, Effective Diameter, Water Equivalent Diameter, TG-293