ABSTRACT

Mammography examination is an effective choice for early detection of breasts, either in the form of screening or diagnosis. The breast tissue is highly sensitive to radiation exposure. Therefore, the dose selection must be precise and maintained optimally to avoid unnecessary radiation exposure. One of the tools used for optimizing patient doses is determining the Diagnostic Reference Level (DRL) value. DRL in mammography is expressed in Mean Glandular Dose (MGD) with units of mGy. This study aims to determine the typical Diagnostic Reference Level (DRL) value of hospitals for mammography modality breast examinations in 2019-2022 by calculating the 2nd quartile of the Mean Glandular Dose (MGD) value. This study also compares the 2nd quartile value with the 3rd quartile value of the national DRL in Indonesia and other countries and analyzes the factors that influence the magnitude of the MGD value. From 1,484 data in 7 Indonesian hospitals, the typical DRL results were in the range of 1.24-2,314 mGy for the Mediolateral Oblique (MLO) projection and 1.15-2,314 mGy for the Craniocaudal (CC) projection. The quartile value of mammography DRL in this study was 1.8 mGy for the MLO projection and 1.78 mGy for the CC projection. The results of the analysis showed that the quartile value of the 3rd MGD in this study was higher than in other countries, but still below the safe limit set by the IAEA of 3 mGy/exposure. Factors that influence the magnitude of the MGD value are differences in the use of x-ray technology types, x-ray machine brands, anodes/filters, compress thickness, and exposure factors such as kV and mAs. The MGD value increases proportionally with compressed thickness and exposure factors.

Keywords: Mammography, Optimization, DRL, MGD, Typical DRL