

Evaluation of AGD in digital breast tomosynthesis relative to those in two-view full field digital mammography

H.S. Niroshani^{1*}, H.D.N.S. Hathurusinghe² and R. Tudugala¹

¹*Department of Radiography & Radiotherapy, Faculty of Allied Health Sciences, Kotelawala Defence University, Sri Lanka,* ²*Department of Radiology, Nawaloka Hospitals Plc, Sri Lanka*
*sach06025@gmail.com

Digital Breast Tomosynthesis (DBT) is performing in high resolution limited angle tomography at radiographic dose levels. Advanced system facilitates the DBT along with 2 view Full Field Digital mammography (FFDM). The objectives of this study were to compare the Average Glandular Dose (AGD) of DBT and FFDM and to calculate the percentage of radiation dose reduction when using DBT when compared with FFDM. The study was carried out using data base of DBT system in a private hospital. In the investigation we analyzed the dose of 251 patients who underwent mammographic examinations of both FFDM and DBT. All data analyses were done using IBM SPSS statistical software version 20.0. P-value of 0.05 was considered as statistically significant. The explanatory variables were age, breast thickness, kVp, mAs, target/filter combination, and AGD values of DBT and FFDM. Mean values for the patient age and compressed breast thickness were 50 years and 49 mm (± 11.9 SD) respectively. The majority of the images were acquired using W/Rh target/filter combination and 51% patients came for the diagnostic mammograms and 49% for screening mammograms. A wide kVp range was observed for DBT than FFDM while mAs range was lower in DBT. According to the results total average glandular dose (TAGD) from FFDM and DBT for diagnostic was 4.21mGy (± 1.46 SD), for screening 4.04 (± 1.31 SD) and there was a statistically significant difference between mean values of TAGD. Mean AGD for Mediolateral Oblique (MLO) view in DBT was 2.05mGy (± 0.60 SD), in FFDM 2.73mGy (± 1.02 SD). AGD for Craniocadal (CC) view in DBT was 1.63mGy (± 0.36 SD) and for FFDM it was 1.83mGy (± 0.66 SD). AGD to the breast from DBT was significantly lower than that for FFDM while range was lower in FFDM than DBT. There was a significant difference between mean values of CC and MLO views in DBT and FFDM ($P < 0.05$). It was evident that AGD from DBT was lower than that for FFDM further AGD was reduced by 55.3% by using DBT with compared to TAGD, using both FFDM and DBT together for same patient and AGD was reduced 19.19% by using DBT when compared to AGD from FFDM.