ABSTRACT

Intensity Modulated Radiation Therapy (IMRT) has become one of the main technologies in the field of radiotherapy because it is able to provide a more optimal radiation dose to the target volume and minimal exposure to healthy compared to conventional radiotherapy. Therefore, various quality assurance procedures are required to ensure that IMRT treatment can be given optimally and safely. One of the most important QA procedures is the of dose audits quality assurance in the form of patient specific quality assurance (PSQA). There are various methods of dose measurement and evaluation that can be used in IMRT PSQA procedure. In this report, a study was conducted to compare IMRT PSQA technique with zero and non-zero gantry angle setup in selected cancer cases. The dose measurement method was carried out in 2D using a 2D array detector. Dose evaluation was carried out using the γ index method with a tolerance limit value of γ passing rate $\geq$ 95% (DD/DTA 3%/3 mm and dose threshold 10%). The selected cancer cases were cases that were commonly treated with IMRT technique, which are prostate, breast, and lung cancer. Based on the measurement results, there is a difference in the γ index value between the IMRT PSQA with a zero gantry angle setup and a non-zero gantry angle setup caused by the inaccuracy of the MLC position to the gantry angle due to the effects of gravity and attenuation by the radiation table, where the average difference is in the range of 1.3% - 1.9% for the three cancer cases. Then between cancer cases, there is a variation in the γ index for the same gantry angle setup due to variations in the size of the target volume, where the range is 97.5% - 99.7% for the zero gantry angle setup and 96.7% - 98.2% for the non-zero gantry angle setup. Therefore, the gantry angle setup in PSQA will affect the γ index value for each cancer cases, but does not affect the PSQA test results. For the same gantry angle setup, prostate cancer has the smallest average γ index value, followed by breast cancer, and followed by lung cancer which has the largest value.

Kata kunci : *Gamma Index*, IMRT, PSQA