ABSTRACT

The treatment for cervical cancer includes surgery, chemotherapy, and radiotherapy. Radiotherapy techniques used include Intensity Modulated Radiation Therapy (IMRT) and Volumetric Arc Therapy (VMAT). The purpose of this study was to compare IMRT and VMAT techniques in terms of better dose distribution, conformity, and homogeneity. This study was conducted by collecting medical records of 15 patients with stage III cervical cancer to determine the dose distribution in the Planning Target Volume (PTV) and Organs at Risk (OAR), Conformity Index (CI), and Homogeneity Index (HI) analyzed based on the Dose Volume Histogram (DVH). The results showed that all patients received optimal doses from both techniques, but VMAT was more optimal by 99.9% compared to IMRT 99.7%. Dose distribution to OAR using IMRT on the rectum volume exposed to doses ranged from 0-68% with an average volume of 32.5% and the bladder volume exposed to doses ranged from 0-77% with an average volume of 44.48%. Then in VMAT technique, the rectum volume exposed to doses ranged from 0-80% with an average volume of 41% and the bladder volume exposed to doses ranged from 0-80% with an average volume of 50%. IMRT technique has an average HI value of $(5{,}17 \pm 1{,}56) \times 10^{-2}$ and a CI value of $(99{,}72 \pm 0{,}43) \times 10^{-2}$. VMAT technique has an average HI value of $(4{,}54 \pm 1{,}11) \times 10^{-2}$ and a CI value of $(99{,}93 \pm 0{,}14) \times 10^{-2}$. The results of this study show that VMAT technique is relatively superior in terms of dose distribution, conformity, and homogeneity compared to IMRT technique. While IMRT technique is relatively superior in terms of protection against OAR compared to VMAT technique.

Keywords: Cervical Cancer, IMRT, VMAT, Radiotherapy, Confomity Index, Homogeneity Index.