

ABSTRAK

Sel kanker nasofaring memerlukan perlakuan khusus dalam radioterapi, karena terdapat organ sekitar yang berbahaya jika terkena radiasi. Modifikasi radioterapi diperlukan untuk memaksimalkan dosis serap sel kanker dan meminimalkan pada organ sekitar. Penelitian ini bertujuan untuk menentukan distribusi dosis serap radiasi sel kanker nasofaring dan organ sekitar, dengan teknik penyinaran *lateral* (sudut 90° dan 270°) dan *supraclave* (sudut 0°) target penyinaran GTV dan PTV, serta menentukan distribusi dosis serap gabungan dari variasi penyinaran dalam bentuk kontur distribusi dosis radiasi. Berdasarkan hasil penelitian, dosis serap paling tinggi didapatkan pada kelenjar getah bening, trakea dan tiroid saat dilakukan penyinaran *supraclave*. Sedangkan sel kanker, mata kanan maupun kiri, dan esofagus menerima dosis serap tinggi penyinaran *lateral* target GTV, dan sel kanker, esofagus dan mata kiri mendapatkan dosis serap lebih tinggi pada penyinaran *lateral* target PTV. Nilai dosis serap gabungan teknik *lateral* dan *supraclave*, yaitu sel kanker 2,99857 Gy, mata kanan 1,31756 Gy, dan mata kiri 1,19737 Gy, serta kelenjar getah bening 0,5965 Gy pada target GTV. Sedangkan sel kanker 2,8976 Gy, esofagus 0,8076 Gy dan trakea 0,76667 Gy pada target PTV. Dosis serap pada sel kanker melebihi batas dosis penyinaran per fraksi yaitu 2 Gy sedangkan organ sekitar sel kanker jauh dari ambang batas dosis yaitu kurang dari 1,6 Gy. Sehingga simulasi perhitungan metode *Monte Carlo* belum dapat dikatakan berhasil meski dosis serap organ normal masih dikatakan aman.

Kata Kunci : Dosis serap, teknik penyinaran *lateral* dan *supraclave*, target radiasi GTV dan PTV, Metode *Monte Carlo*.

ABSTRACT

Nasopharyngeal cancer cells require special treatment in radiotherapy, because there are surrounding organs that are dangerous if exposed to radiation. Modification of radiotherapy is needed to maximize the absorption dose of cancer cells and minimize the surrounding organs. This study aims to determine the absorbable dose distribution of radiation of nasopharyngeal cancer cells and surrounding organs, with lateral radiation techniques (angles 90° and 270°) and supraclavicle (0° angles) of GTV and PTV irradiation targets, and determine the combined absorption dose distribution of variations in internal radiation contour form of radiation dose distribution. Based on the results of the study, the highest absorption dose was found in lymph nodes, trachea and thyroid when supraclavicle irradiation was carried out. Whereas cancer cells, right and left eye, and esophagus receive high absorbency doses of lateral radiation from the GTV target, and cancer cells, esophagus and left eye get higher absorbency doses on lateral radiation of the PTV target. Absorbed dose values combined with lateral and supraclavicle techniques, namely cancer cells 2.99857 Gy, right eye 1.31756 Gy, and left eye 1.19737 Gy, and lymph nodes 0.5965 Gy on the GTV target. While cancer cells 2.8976 Gy, esophagus 0.8076 Gy and trachea 0.76667 Gy at PTV target. Absorption doses on cancer cells exceed the limit of radiation dose per fraction, which is 2 Gy while the organs around cancer cells are far from the dose threshold which is less than 1.6 Gy. So that the simulation of the calculation of the Monte Carlo method cannot be said to be successful even though the absorbable dose of normal organs is still said to be safe.

Keywords: Absorption dose, lateral and supraclavicle irradiation techniques, GTV and PTV radiation targets, Monte Carlo Method.

