

Correlation between Pre-treatment Serum Thyroglobulin Levels and Dose Rates Emitted from Radioiodine (¹³¹I) Treated Patients

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The treatment of thyroid cancer generally comprises of total thyroidectomy followed by oral administration of ¹³¹I. Patients receiving radioiodine are potentially a significant source of radiation to the medical staff, family members and public. Serum thyroglobulin is used as tumor marker and to see whether there are any functioning residual thyroid tissues in differentiated thyroid cancer (DTC) after surgery. Our aim was to identify the correlation between the pre-treatment thyroglobulin levels and emitted dose rates of ¹³¹I treated patients. Data was collected from selected thyroid cancer patients who attended the routine clinic at the Nuclear Medicine Unit, University of Peradeniya. Blood samples were obtained one week prior to the ¹³¹I treatment date to measure the serum thyroglobulin. Dose rates from ¹³¹I treated patients (treated with the activity of 30 mCi) were measured at one meter distance from the anterior neck area after 1 hour and 2 hours using survey meter. Data were analyzed using Minitab 18.0 by using Pearson's correlation. The study comprised of 74 patients with a mean age of 40.56 years (SD= 10.82) and of this population 84.12% were females and 15.88% were males. The mean serum thyroglobulin level was 5.338 ng ml⁻¹ (SD= 5.981) with a minimum of 0.1 ng ml⁻¹ and a maximum of 22.80 ng ml⁻¹. The mean dose rates emitted after one and two hours were 45.13 μSv h⁻¹ (SD = 4.367) and 41.83 μSv h⁻¹ (SD= 4.83) respectively. The Pearson's correlation showed a moderate relationship between the pre-treatment serum thyroglobulin levels and emitted dose rates from ¹³¹I treated patients after 1 hour (r=0.679) and 2 hours (r=0.690) of the therapy. Higher Serum Thyroglobulin in DTC patients is an indication of more residual thyroid tissue, and higher emitted dose rates from these patients.

Keywords: ¹³¹I Therapy, Radiation Protection, Thyroid Cancer