Abuqbeitah Mohammad et al., J Nucl Med Radiat Ther 2015, 6:4
http://dx.doi.org/10.4172/2155-9619.S1.002

OMICS International
conferenceseries.com

International Conference on
Medical Physics
August 03-05, 2015 Birmingham, UK

Bone marrow dosimetry and lesion absorbed dose determination in distal metastatic differentiated thyroid cancer

Abuqbeitah Mohammad[1], **Yeyin Nami**[1], **Aygun Aslan**[1], **Demirci Emre**[2], **Ocak Meltem**[1] and **Kabasakal Levent**[1]
[1]Istanbul University, Turkey
[2]Istanbul Sisli Etfal Training and Research Hospital, Turkey

Aim: Dosimetry is an alternative strategy to the traditional fixed radioactive iodine treatment in metatstatic thyroid cancer therapy. Pretherapy dosimetry is increasingly recommended to calculated the maximum tolerable Activity for each patient in order to deliver absorbed dose not exceed 2 Gy for the red bone marrow and meanwhile optimization the response level of desired targeted lesions.

Materials and Methods: 14 patients (9 female ,5 Male and Mean age 44±15.84 y ,TSH 65±43 µIU/ml,HTC 38.43±3.81 ng/ml, 5 patients were prepared by rhTSH; 9 patients by thyroid withdrawal) suffering from metastatic differentiated thyroid cancer were submitted to pretherapy maximum safe activity and lesion absorbed dose protocol to establish successive therapy using OLINDA/EXM Software and five different dosimetry Methods for comparison purposes. Dual head scintillation camera was utilized to measure whole body and lesions activities by drawing region of intrest adjacent to whole body and lesion contours and performing attenuation correction Besides to Blood samples collection which were measured in well –gama counter at several time points 2.6.24.48.72.96.144hours after oral administration of Radioiodine tracer (2mCi). To verify normal back ground count rate, 1 minute acquistion was performed before each whole body scan and subtracted from the related scan's count.The neccesssery data were collected and modified according to the parameters of the dosimetry methods adopted by OLINDA/EXM, Wessels et al,Traino et al,Siegel et al,Shen et al ,and Keizer et al .

Results: According to OLINDA/EXM software mean absorbed dose from tracer activity was 3.11±1.76mGy/mCi(for thyroid withdrawal 4.02±2.06 mGy/mCi ; and rTSH patients was 1.96±0.44) ,Wessels et al was 3.27±1.9mGy/mCi,Traino et al was 2.68±1.53 mGy/mCi,Kiezure et al was 2.2±1.16mGy/mCi,Siegal et al was 2.56±1.86 mGy/mCi , and Shen et al was 4.05±3.4 mGy/mCi. mean absorbed dose to distal metastatic lesions was 3.4±4.5 Gy/mCi. The deviation between the results of OLINDA/EXM software and the other dosimetry methods was variable 5.1%, -13.8%, 30%, -17%, and -29%.

Discussion: Mean absorbed dose of bone marrow in Our study using OLINDA/EXM as reference for thyroid withdrawal patients was (4.02±2.06 mGy/mCi) similar to findings reported by Hänscheid H et al inwhich Aaverage bone-marrow doses were determined as average 4.2mGy/mCi (3.2 – 8.5 mGy/mCi) .For the patients with euthyrodisim (using rTSH) the absorbed dose was significantly lower (mean: 1.96±0.44) And also within a range reported by other publishers (2.2-7.2mGy/mCi) for euthyroid .Chiese et al reported bone marrow absorbed dose using blood –based dosimetry 1.7-6.2 mGy/mCi .in this study four patients were prepared by exogemous TSH and absorbed dose of bone marrow was (1.59-7.26mGy/mCi) which is close to Keizer et al findings (2.2-7.2mGy/mCi) for euthyroid patients dosimetry.

Conclusion: Our study demonstrated that there is no statistically significant difference between the results reported by Wessels et al ,Shen et al and OLINDA/EXM for estimating red bone marrow dose .The amount of activity calculated to deliver 80 Gy for some distant metastatic lesion was< 250 mCi which represent the traditional maximum fixed dose.

Biography

Mohammad has completed his BSc in Alquds university / Medical Imaging 2010, and MSc in Nuclear Medicine and targeted therapy from Istanbul University 2015. In the same year he started to be PhD Candidate in Istanbul University / School of Medicine/Nuclear Medicine Dept. He has scientific interests in the field of internal therapy dosimetry and Molecular & Multimodality Imaging, dose- limiting tissues Protection during therapy and clinical trials using radioactive tracers.

qbeta95@hotmail.com