

ASSESSMENT OF OCCUPATIONAL DOSE FROM RADIOIODINE ^{131}I FOR THYROID THERAPY IN NUCLEAR MEDICINE DEPARTMENT IN DR. SARDJITO GENERAL HOSPITAL, YOGYAKARTA, INDONESIA

Mohammad Ahmad Hmdan Abu Amer¹, Bagaswoto², Yana Supriatna³.

¹Graduate Student of Biomedical Science Faculty of Medicine Universitas Gadjah Mada, ²Department of Radiology Faculty of Medicine Universitas Gadjah Mada, ³Department of Radiology Faculty of Medicine Universitas Gadjah Mada, Yogyakarta, Indonesia

ABSTRACT

Background: Nuclear medicine procedures are among the safest diagnostic imaging tests available. The amount of radiation involved is comparable to that received during an X-ray. Nuclear medicine covers all of the diagnostic and treatment methods that use radioactive isotopic substances, Over 37 million nuclear medicine procedures are performed each year, and demand for radioisotopes is increasing rapidly, as well as in 2015 the number of thyroid therapy at Dr. Sardjito General Hospital is 152 cases of thyroid therapy, the oral administration of ^{131}I has been a commonly accepted procedure for treatment of benign and malignant disorders of the thyroid since the 1940s.

Objectives: The aims of this study was to explore the occupational worker in Nuclear Medicine Department in Dr. Sardjito General Hospital, Yogyakarta, Indonesia receives effective dose from radioiodine ^{131}I through thyroid therapy less than IAEA recommendations, as well to find if there are a difference of effective dose quantity between three groups in Nuclear Medicine Department in Dr. Sardjito General Hospital, Yogyakarta, Indonesia.

Methods: This study was conducted in nuclear medicine departments in Dr. Sardjito General Hospital, Yogyakarta, Indonesia. The target of this research is the occupational workers who are working in Nuclear Medicine Department. The radiation effective dose was measured for the occupational that could be received from radioiodine ^{131}I . The effective dose was measured and evaluated through one week period. The sample size ($n = 10$) was include all population. The sample was subdivided into three groups: group I is the radiation workers (health workers) which involve radiologists ($n = 1$), resident ($n = 2$) radiographer of nuclear technologists ($n = 1$), radiation safety officer ($n = 1$), nurses ($n = 3$), group II is secondary worker that include housekeeping ($n = 1$), group III is non radiation workers that is include administrators and administrative assistants ($n = 1$). This research was done by using PMD 222b dosimeter. A cross-sectional design to determine the radiation dose that maybe exposed to the medical staff who is working in nuclear medicine department by measured the effective dose. Data analysis was performed by using one way ANOVA test.

Results: There is no difference between the occupational effective dose for each worker, ($P > 0.05$), Group (I) with the mean dose is (0.0033 mSv) and standard deviation is (0.00345), Group (II) with the mean dose is (0.0038 mSv) and standard deviation is (0.00148). Group (III) with mean (0.0042 mSv) and standard deviation is (0.00110), therefore it is concluded that there are no difference between the three groups.

Conclusion: The occupational team in Nuclear Medicine Department in Dr. Sardjito General Hospital, Yogyakarta, Indonesia receives the radiation effective dose from radioiodine ^{131}I through thyroid therapy less than the IAEA recommendations. As well the quantity of effective dose that received by occupational workers in Nuclear Medicine Department in Dr. Sardjito General Hospital, Yogyakarta, Indonesia for three groups is similar.

Keywords: Nuclear Medicine, International Atomic Energy Agency, Effective Dose, Iodine-131.