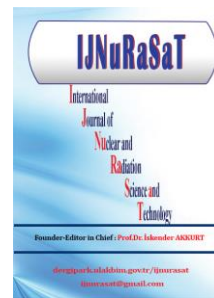




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*International Journal of
Nuclear and Radiation Science and Technology
(IJNuRaSaT)
Vol. 1-No.1 (2016) pp. 1-3
<http://ulakbim.dergipark.gov.tr/ijnurasat>*



Research Article

Radiation Dose Measurement in Computed Tomography for Pediatric Patients

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(Received date: 10 November 2015 , Accepted date: 1 February 2016)

Keywords

Computed Tomography
Childhood
Radiation dose

Abstract: Computed tomography (CT) scans to create detailed in the body of the imaging procedure that uses x -ray equipment. A picture created during a Computed tomography (CT) process shows the organs, bones, and other tissues in a thin “slice” of the body. Computed tomography (CT) is used in cancer in many different ways to detect abnormal growths, help diagnose the presence of a tumor, provide information about the stage of a cancer, determine exactly where to perform a biopsy procedure. Computed tomography (CT) becomes one of the most important technique to diagnose disease even for pediatric patients. The dose administered to the patient varies according to the patient's height and weight. As the given more dose to the patient provide better and clear picture, increasing with the patients' weight and height the high dose is given. Normally computed tomography image for each region are to be taken in doses that should be standard protocol. These doses are increased with increasing the image quality.

1. Introduction

Radiation can be described as energy transfer and it is sourced from both in natural and man-made. While natural radiation has existed since creation of universe, man-made radiation is produced by technological development. After development of technology the radiation started to be used in a variety of different fields. The most important field is medicine where it is used both in diagnostic and treatment. The technological devices used in radiological unit in hospitals mainly emit radiation [1]. Computed Tomography (CT) is one of the main device used in hospitals for diagnosis process. As the radiation is hazardous for human the dose received by patient should be minimized. This is more important if the patients are children. Because children's weight are low and the dose is depending on body size as a result of non-implementation of the IT protocols given unnecessary radiation causes [2,3]. Nowadays the using of CT increased for pediatric patients. The rate was 4% in the period 1980-1990 year while it is increased to 5% in following years [4,5]. Computed tomography (CT)

delivers much higher radiation doses than do conventional X-rays. Minimizing X-rays exposure from pediatric Computed tomography (CT), will decrease of Computed tomography (CT) related cancers in community of people.

In this paper the dose measurement results for routine pediatric head Computed tomography (CT) protocols in hospital is given and discussed.

2. Material and Method

In this paper, the radiation dose has been measured in CT while pediatric patient are being imaged. Figure 1 shows Suleyman Demirel University hospitals CT unit. The measurement has been performed during exposure of brain for pediatric patients. The measurement has been done using dosimeter shown in Figure 2. In the measurement while dosimeter can record in different unit it was recorded as effective dose in unite of micro Sievert.



Figure 1. Computed Tomography (CT) unite in Suleyman Demirel University



Figure 2. Dosimeter used for measurements

3. Results and Discussions

Radiation dose has been measured in CT unite located in Suleyman Demirel University Medical hospital. The results have been obtained for

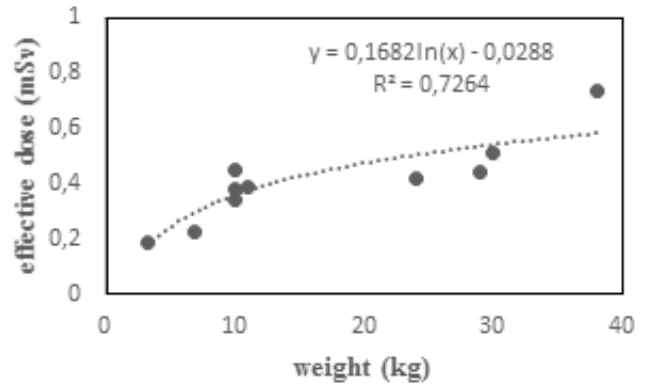


Figure 3. Measured effective dose as a function of weight of patients

pediatric patients as those are more sensible and should be careful. The results are displayed in Figure 3 as a function of weight of patients. It can be seen from this figure that an exponential linear relation can be seen between effective dose and weight of patients. This expectable results as the while the weight is increased the dose treatment dose increased.

It can be concluded from this work that the Computed tomography (CT) imaging unit is important as it is one of the most important diagnosis apparatus nowadays and thus using of Computed tomography (CT) has increased in recent years. In the results of this study it is clearly seen that the measured dose is much lower than permitted dose limit, it should be avoided to image especially children in CT for many times in short period.

Acknowledgement

Authors thank to head and staff of Suleyman Demirel University Medicine Faculty Radiology Unit for understanding and helping us during this measurements.

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