Letter to Editor

Open Access Journal of
Biomedical Science
ISSN: 2690-487X

# Radiological Protection in Pediatric Patients. Are we Doing it Well?

**Mányeles Brito Vázquez***

*Imaging Diagnostic Department, Sancti Spíritus Medical Sciences University, Cuba*

## LETTER TO EDITOR

**Dear Editor,**

Nowadays, with the development of high technology, is very common in our pediatric attention centers the indiscriminate use of exams with a lot of dose of radiation. But do all health personal know the risk about the constant use of those kind of exams? The International Commission on Radiological Protection (ICRP) introduced the Diagnostic Reference Level (DRL) as the tool for optimizing dose management in medical imaging procedures. Any examination must be justified by its diagnostic contribution in relation to irradiation. Its performance must be optimal, that is to say in accordance with the ALARA principle, As Low as Reasonably Achievable, and the doses delivered must be regularly evaluated to compare with the diagnostic reference levels [1,2].

[1] made a multicenter study in Cameroon in three different hospitals with three different CT scan equipment, and they discovered that the values in their centers were found significantly higher than values of France's DRL and they proved that increasing the gantry rotation speed and the slice collimation (cSL) by changing detector configuration can decrease the radiation dose without significantly lowering the contrast resolution and yield acceptable CT image quality. So, pediatric examination can be performed with low kV and mAs values, although other authors are not agree with that affirmation [3]. The American Association of Physicists in Medicine (AAPM) devised the size-specific dose estimate (SSDE) method, a new index that takes into account the size of the patient for CT dose index (CTDIvol) determination. SSDE is defined by multiplication of the object correction factor (SSDE conversion factor) normalized with a phantom diameter of the same diameter as 16/32 cm CTDIvol. It is therefore possible to use SSDE to calculate the organ dose with an accurate reflection of the physique of the patient [2].

It is essential to minimize exposure to ionizing radiation in children for various reasons. The risk of developing a tumor from exposure to a given dose of radiation is greater in childhood. Various strategies can be used to reduce exposure to ionizing radiation. It is fundamental to avoid unnecessary tests and tests that are not indicated, to choose an alternative test that does not use ionizing radiation like ultrasound and MRI and to take a series of measures that minimize the dose of radiation that the patient receives, such as avoiding having to repeat tests, using the appropriate projections, using shields and adjusting the protocol (MAs, Kv or pitch) to the patient's body volume [4]. Adverse health effects of exposure to ionizing radiation were identified soon after the discovery of x-rays in 1895. Harmful effects of radiation at high doses are well documented. These are dose-dependent effects and they are a consequence of the death of a large number of cells in a tissue or organ. In radiological protection terms, a low dose is that less than 0,2 Gy to which it is very unlikely that more than one radiation energy absorption event will occur before the repair mechanisms can act on it.

Many studies report the relationship among high dose of radiation and the possibility to develop cancer. Ruixue Huang and col [5] reported as a result in a Meta-Analysis of Cohort Studies that the risk of later cancer was 1.32-fold higher for children exposed to CT than those without exposure and [6] show that their results are consistent with the notion that even low doses of ionizing radiation observably increase the risk of childhood leukemia. [7] found evidence that CT-related radiation exposure increases brain tumor risk but in the other hand, [8] said that neither whole head CT nor cumulative brain dose to the brain increased the risk of glioma or of all brain tumours, although it should be taken with caution. In our daily medical practice, we found conflicts like not always it is selected an image technique without ionizing radiation when it is possible, many exams are repeated to don´t mobilize the patient to

Quick Response Code:

**Address for correspondence:** Mányeles BV, Imaging Diagnostic Department, Medical Sciences University, Cuba

**Received:** May 15, 2022 **Published:** May 20, 2022

**How to cite this article:** Mányeles BV. Radiological Protection in Pediatric Patients. Are we Doing it Well?. 2022- 4(3) OAJBS.ID.000452. **DOI:** 10.38125/OAJBS.000452

other hospital with better conditions, exist abuse lucking for the best image, don´t use of protection shield and oncological patients require multiple ionizing radiation studies in their serial evaluations. All these demonstrate that is necessary the optimization rules in pediatric tests in our hospitals. Let´s go to care our children!

## REFERENCES


1. Fotso KE, Samba O, Fotue A, Abogo S (2021) Radiation dose evaluation of pediatric patients in CT brain examination: multi-center study. Scientific Reports 11: 4663.
2. Takakiyo T, Hideki O, Shuichi O, Yoko S, Ikuo K (2018) Consideration of the usefulness of a size-specific dose estimate in pediatric CT examination. Journal of Radiation Research 59(4): 430-435.
3. Siegel JA, Sacks B, Pennington CW, Welsh JS (2017) Dose optimization to minimize radiation risk for children undergoing ct and nuclear medicine imaging is misguided and detrimental. J Nucl Med 58(6): 865-868.
4. Lancharro ZAM, Marín RC (2016) Radioprotection and contrast agent use in pediatrics: what, how and when. Radiología 58(S2): 92-103.
5. Ruixue H, Xiaodan L, Li H, Ping KZ (2020) Radiation exposure associated with computed tomography in childhood and the subsequent risk of cancer: a meta-analysis of cohort studies. Dose Response 18(2): 1559325820923828.
6. Atte N, Jani R, Olli L, Anssi A (2018) Radiation exposure from computerized tomography and risk of childhood leukemia: finnish register-based case-control study of childhood leukemia (FRECCLE). Haematologica 103(11): 1873-1880.
7. Meulepas JM, Ronckers CM, Smets AMJB, Nievelsteinet RAJ, Gradowska P, et al. (2019) Radiation exposure from pediatric CT scans and subsequent cancer risk in the Netherlands. J Natl Cancer Inst 111(3): 256-263.
8. Noriko K, Yoshitake T, Ono K, Kai M, Bynes G, et al. (2020) Computed tomography of the head and the risk of brain tumours during childhood and adolescence: results from a case-control study in Japan. J Radiol Prot 40: 1010-1023.