

Pediatric Diagnostic Nuclear Medicine Studies and Administered Radiopharmaceutical Activities at a Tertiary Hospital: A Contrast with Activities Based on the European Association of Nuclear Medicine Dosage Card (version 5.7.2016)

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Published November 11, 2021

ABSTRACT

Background and Objective: Pediatric diagnostic nuclear medicine studies provide information regarding the physiological and the molecular processes hence they may play a significant role in diagnosis of child ailments. However, quantification of appropriate pediatric activities may present challenges. The study investigated the types of pediatric diagnostic nuclear medicine studies and administered radiopharmaceuticals activities (ARAs) at tertiary hospital (TH) to determine whether they adhered to the European Association of Nuclear Medicine (EANM) Dosage card (version 5.7.2016).

Methods: Archived pediatric patients' data (weight, age, type of diagnostic nuclear medicine study and corresponding (ARAs)), were documented for all studies undertaken from 2012-2015. For each diagnostic nuclear medicine study conducted, the corresponding ARAs were calculated using the EANM Dosage card (version 5.7.2016). ARAs per kilogram were then calculated for each patient using both dosing guidelines and then compared.

Results: The most commonly conducted pediatric diagnostic nuclear medicine studies included bone scans, thyroid scans, renal scans, hepatobiliary iminodiacetic acid (HIDA) scans, meta-iodobenzylguanidine (MIBG) scans and gastroesophageal reflux scans. The mean ARAs per kilogram were; bone scans (57.7 vs 9.6 MBq/kg), thyroid scans (7.0 vs 1.5 MBq/kg), renal scans (13.9 vs 3.2 MBq/kg), ^{99m}Tc-HIDA scans (13.7 vs 5.8 MBq/kg), MIBG scans (15.5 vs 9.8 MBq/kg), gastroesophageal reflux scans (2.1 vs 1.1 MBq/kg), following the TH guidelines and the EANM Dosage card respectively. The EANM Dosage Card (version 5.7.2016) guaranteed low variability of ARAs compared to the TH guidelines.

Conclusion: The mean ARAs per kilogram based on the EANM Dosage card (version 5.7.2016) were lower than those calculated using the TH guidelines.

Keywords: Pediatric nuclear medicine, Radiopharmaceuticals, Administered activities

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Citation: Nyathi M. (2021) Pediatric Diagnostic Nuclear Medicine Studies and Administered Radiopharmaceutical Activities at a Tertiary Hospital: A Contrast with Activities Based on the European Association of Nuclear Medicine Dosage Card (version 5.7.2016). BioMed Res J, 5(S2): 04.

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