

RADIATION RISKS TO CHILDREN FROM MEDICAL IMAGING

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Key words: Medical imaging, children, ionizing radiation, risk, radiation dose, nuclear imaging.

INTRODUCCIÓN

Medical imaging is extremely important value and role in the care of the ill or injured child. This includes diagnosis of emergent including life threatening conditions, as well as an aid in management, such as appropriate triage to promote efficient and judicious use of medical resources. For example, CT and MR have been heralded as one of the most significant medical advancements in the past 30 years, based on a survey of medical practitioners (1). While much of the following material will discuss the specific risks of ionizing radiation related to medical imaging, one must not lose sight that when used appropriately, the benefits of medical imaging are far in excess of real and potential risks.

Much of medical imaging depends on the use of x-rays, a type of ionizing radiation, for imaging formation. The general modalities that use x-rays consist of radiography, fluoroscopy (including angiography), computed tomography (CT) and nuclear imaging (also known as nuclear medicine). Other modalities which do not use ionizing radiation which are commonly used for medical imaging consist of sonography, and magnetic resonance imaging. Radiation, in relatively high doses, has known biological effects. These effects include the induction of cancer. Almost without exception, diagnostic medical imaging uses low levels of radiation and the types of biological effects and attendant risks of cancer will be different (as discussed below). The topic of radiation

risk in medical imaging is also timely, especially in the United States where there has been increased public attention mostly through media scrutiny reporting radiation doses from medical imaging and biological effects. These reports included hair loss from perfusion imaging (a type of brain CT examination) (2), radiation dermatitis from CT examination in a child (3), relatively high doses from radiography in dental evaluation (4), and excessive radiation doses from improperly performed neonatal radiography (5). Because radiation related effects especially cancer may not be evident for years even decades, concern may be long lasting. I have received communications from parents even several years after imaging evaluation who are concerned about what they have heard about cancer risks and radiology in the media. Recently, the first scientific investigation associating pediatric CT with cancer was published in Lancet (6). Taken together, the importance of medical imaging using ionizing radiation, and continued, and in some circumstances, escalating use of this imaging in both adults and children, and the persistent and often pervasive attention to the long lasting possibility of cancer from ionizing radiation in levels found with diagnostic medical imaging necessitates a reasonable understanding of the risk aspect of the risk/benefit ratio for diagnostic medical imaging. This basic understanding applies to all medical practitioners, not just those with imaging expertise (i.e. radiologist). These healthcare providers, such as pediatricians or emergency medicine physicians will be potentially involved in discussions with colleagues about risks and benefits in patient management, as well as conversations with patients about the potential risks and benefits.

This topic of radiation risk and medical imaging applies to all ages. However, it is particularly important in children. Children are relatively

Radiation Risks In Medical Imaging

Richard Bailey



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