

Radiation Dose Reduction: Comparing The Amount Of Publications Published In Diagnostic And Interventional Radiology

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Abstract:

Our goal was to compare and measure the level of awareness among the diagnostic and interventional radiology communities about radiation dose reduction.

Methods: Between 2005 and 2015, the search terms "interventional/computed tomography" and "radiation dose/radiation dose reduction" were used to analyze abstracts accepted to the annual meetings of the Society of Interventional Radiology (SIR), the Cardiovascular and Interventional Radiological Society of Europe (CIRSE), the Radiological Society of North America (RSNA), and the European Congress of Radiology (ECR). The aforementioned search terms were used in a PubMed query covering the years 2005–2015.

In conclusion, there may be a need for more education and discussion on this subject given that the rise in abstracts about radiation dose reduction that has been observed in the field of interventional radiology over the past ten years has not coincided with the increase in volume observed in diagnostic radiology.

Keywords: Radiation, diagnostic radiology, interventional radiology.

Introduction

Both professional societies and the general public have increased their scrutiny of radiation doses related to medical procedures during the last ten years. Roughly 14% of the total radiation dose from radiological procedures in the United States in 2006 came from 4 million interventional procedures carried out there (Mettler, 2009). About 49% of the total radiation dose from radiological procedures in the same year was attributed to the estimated 67 million CT scans that were conducted in the US. Because computed tomography exams and interventional procedures contribute disproportionately large amounts of ionizing radiation, dose reduction in these two modalities has drawn the attention of professional societies and providers alike (Cardella, 2003). The number of contributions to the radiological literature pertaining to radiation dose reduction has steadily increased over the past ten years as a result of technological advancements and growing interest in lowering radiation dose from medical procedures. Scientific presentations and workshops with a singular emphasis on dose reduction have become standard features of national and international radiology conferences. The current study aims to quantify this increased interest and awareness through a systematic analysis of scientific and educational contributions made between 2005 and 2015 to the annual meeting of the Radiological Society of North America (RSNA), the European Society of Radiology (ECR), the Cardiovascular and Interventional Radiological Society of Europe (CIRSE), and the Society of Interventional Radiology (SIR). Furthermore, a review of scientific journal articles published during that time period in the medical literature about dose reduction (Molinari, 2013).

Interventional Radiology:

The number of abstract presentations at the annual SIR and CIRSE meeting indicates that interventional radiology's interest in the topic has not increased at the same rate as diagnostic radiology's. In 2005, there were six abstracts about radiation dose presented at the SIR and CIRSE annual meetings. In 2015, there were the most abstracts ever, totaling 27 presentations. Although the number of contributions pertaining to CT and interventional radiology dose reduction at the corresponding meetings increased yearly, there were substantially fewer interventional abstracts overall when compared to the total number of abstracts related to CT dose reduction (Brenner, 2007). The

radiological literature reflects the rise in abstracts about radiation dose and dose reduction that one can find at meetings for diagnostic and interventional radiology. Between 2005 and 2012, the total number of publications concentrating on CT dose reduction doubled, and between 2005 and 2011, the number of publications pertaining to radiation dose during interventional procedures doubled. Nonetheless, the radiological community was the main forum for discussion on the dangers of CT and ionizing radiation (Smith, 2009).

The Radiological Community:

The radiological community came to the conclusion that more needed to be done to lower the radiation doses given to adults and children receiving diagnostic and interventional imaging procedures. The Alliance for Radiation Safety in Pediatric Imaging launched the Image Gently campaign in 2008 as a result of this. On the campaign's website, parents, patients, and medical professionals can find out how to reduce the amount of ionizing radiation that kids get during diagnostic imaging procedures (Berdahl, 2013).

Radiation Safety:

Regardless of specialty, medical residents still have a limited understanding of radiation safety (Rathmann, 2015).

Only 27% of residents in other fields were aware of the possibility that interventional personnel could develop a cataract, compared to 47% of residents in radiology. Similarly, only about half of the participating residents answered correctly when it came to the higher radiosensitivity of children compared to adults and the relative radiation dose of an abdominal CT scan compared to a chest X-ray (Goske, 2008). These findings highlight the significance of ongoing initiatives to inform the public and healthcare professionals of all specialties about radiation dose and radiation dose reduction strategies (Brink, 2010).

Recommendations:

A few restrictions call for more explanation. As a measure of awareness, radiation dose and dose reduction strategies for CT and fluoroscopy were applied. Even though these modalities account for a significant portion of the radiation dose, studies in nuclear medicine and diagnostic radiography also play a significant role in the total radiation dose. It is not advisable to extrapolate awareness from the quantity of papers that have been written regarding CT radiation dose

and fluoroscopy. Accepting published papers about radiation dose as typical of diagnostic radiology is another restriction.

One limitation of this study is that it only includes four significant society meetings. Excellent abstracts on radiation dose may also be given at various meetings of subspecialty societies. Furthermore, publications about current initiatives to lower radiation exposure might not accurately reflect patterns of practice in the area. Therefore, whenever fluoroscopy is used, the IRCP emphasizes patient dose monitoring and specific training programs for healthcare personnel outside of the radiology department regarding radiological protection.

Conclusion:

In conclusion, there may be a need for more education and discussion on this subject given that the observed increase in the number of abstracts about radiation dose reduction in the interventional radiology community over the past ten years has not mirrored the increased volume seen within diagnostic radiology. It appears that more education and discussion on this subject may be necessary because the observed increase in the number of abstracts about radiation dose reduction in the interventional radiology community over the past ten years has not mirrored the increased volume seen within diagnostic radiology.

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