A Survey of Public Perception, Concerns and Awareness of Medical Radiation

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Purpose

The use of medical imaging has increased six-fold since 1980, and its use is on the rise second to rapid improvements in technology (5,17). While there has been much professional study devoted to minimizing the radiation risks to patients, recent media reports have raised public awareness of risks associated with medical imaging (10). This study aims to assess patient knowledge and concerns regarding: radiation risks and potential for inducing cancer, the use of contrast, awareness of medical imaging in the media, and perceived amounts of radiation associated with various types of imaging. Patient perception regarding the role of imaging in their management and its perceived benefits, safety and risks of CT scans, as well as amount and effectiveness of information provision by their doctor is explored.

Methods and Materials

Methods:

Study design and purpose was discussed with the SWAHS Human Research Ethics Committee (Westmead and Nepean campus). The study was conducted at Westmead Public and Private hospital as well as local private radiology practices. Patients included were those presenting for non-emergency scans including scans using contrast. There were no exclusion criteria, however emergency patients requiring immediate scans were excluded from the study.

A questionnaire was developed after identifying relevant themes. The themes were identified through literature search, and discussion with relevant health care providers and specialists and patients. The questionnaire consists of 26 questions grouped by: demographics, information provision, awareness of radiation risks, concerns regarding radiation and cancer risks, and awareness of radiation involved with medical imaging modalities.

Procedure:

The self-administered questionnaire was conducted in waiting rooms of both public and private practice to patients prior to having a CT scan from December 2011 and is ongoing. Non-medical CT staff administered the questionnaire. The questionnaires’ contents were not discussed with any referring physicians as to ensure operator blinding.
Results

Analysis:

Data was processed in Microsoft Excel and analyzed using SPSS for Windows. Responses were tested for statistical significance using chi-square testing. Statistical significance was set at p < 0.01. Sample size was set at 200 to maximize statistical power. Preliminary results show are discussed.

Results:

Currently 95 patients have completed the survey. Demographics show the majority of patients were male (57 percent) and just over half were between the ages of 50-69 (51 percent). The majority are English speakers in the home, and 54 percent have post-secondary education.

Ninety one percent of patients agree or strongly agreed that the reasons for the imaging were clearly explained, though 39 percent felt they were not aware of other options. Nearly 94 percent of patients agreed that the CT scan was important in their care, and seven percent of patients had suggested to the referring doctor that they needed CT imaging as part of their care. Only 15 percent were worried about radiation risks with this scan and almost fifty percent agreed that the costs outweighed any risks associated.

Over half of the responders were unaware of any risks associated with CT scans, and of those that were aware, the doctor was the source of information for 51 percent. News, television, friends and the internet were less common sources of information. Fifty-five percent of patients stated they were given no information about the radiation risks. Thirty percent felt that there is no increased cancer risk with CT scans, and 46 percent felt that only one scan had no impact on cancer risk. The majority (67 percent) are unsure if CT scans are safer than x-rays.

When asked to assess the amount of radiation involved with different imaging modalities: three percent felt there was no radiation with x-rays, 32 percent felt CT scans have nil to very small amounts of radiation, 15 percent feel MRI’s have moderate to large amounts of radiation, and 28 percent recognize that ultrasound has no radiation.

Conclusion
There is a clear recognized correlation between medical radiation and increased risks of cancer particularly with multiple CTs (1, 2, 3, 6, 8, 9, 12, 15, 16, 17, 18, 19,). However, the benefits of imaging, including allowing clear diagnoses outweigh the risks in the majority of cases (3, 6, 12, 18).

It is clear from these preliminary results that patients do not have a good understanding of radiation risks, increased cancer risks involved with CT scans (13). Patients overall have a poor understanding of radiation levels with any modality of imaging. While the vast majority of patients recognize the importance of imaging in their care, few patients are suggesting to clinicians that they need to have a CT scan. It has been suggested that patients may be increasing the demand for CT scans as it is seen to be a route to rapid diagnosis (14). This study suggests that inappropriate CT examinations are less likely to be at the request of patients.

Level of education does not appear to impact the level of understanding and concerns with imaging (10) which is corroborated with these results. There is no significant difference thus far between private imaging and public imaging to suggest that there is a difference in level of information provision or options being discussed. It has been previously noted that clinicians themselves have a poor understanding of radiation risks, which makes it difficult to adequately convey the risks to their patients (4, 13, 20).

It would be helpful to provide information on risks at the time the imaging is ordered, as the provision of information is an important aspect of ensuring patient autonomy and decision making (7, 13, 21). This research highlights a lack of adequately informed patients. Fears that a patient may subsequently refuse important imaging after a discussion of risk may lead to cursory information provision. It is important to recognize that increasing patient information does not significantly alter a patients' willingness to have a CT scan when the imaging is indicated (11). Patients are reliant on doctors to be their educated and reliable source of information, and it appears that patients are missing out.

**Personal Information**

**References**


