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ILLUSTRATIVE INVESTIGATION TO EVALUATE THE KNOW-HOW AND OPINION POINT OF PATIENTS TOWARD RADIATION EXPOSURES AND ITS PROTECTION

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Abstract

X-ray imaging is a common procedure performed on a regular basis for diagnostic purposes all over the world. The use of X-rays is increasing rapidly with the introduction of new radiation- oriented therapeutic practices. Although it carries significant diagnostic benefits, extensive exposure to X-ray imaging has been shown to be associated with multiple dose-dependent health risks. Awareness and knowledge among patients regarding the effects of X-ray imaging, therefore, becomes important.

Introduction

Radiations are categorized as ionizing and nonionizing radiations. Ionizing radiations, like X-rays, possess sufficient energy to separate an electron from an atom or molecule, producing free radicals in the process which are chemically unstable and highly reactive (Singh et al., 2015)The emergence of X-ray imaging in the late 1800s has been one of the greatest discoveries in medicinal science, The use of X-rays and many other ionizing radiations is increasing rapidly and extensively with the introduction of new radiation-orientated therapeutic practices (Little et al., 2009; International Commission on Radiological Protection, 2007)

Due to the extensive use of X-ray imaging, its effects should be fully understood. The most important factor when discussing the effects of X-rays is not the amount at a point in the air (exposure) but the amount of energy absorbed by tissue (dose). The dose-dependent adverse effects of X-rays have been linked to cancer and have been a focus for many researchers studying cancer risk in adults and children (Agrawal et al., 2015; Little et al., 2009; United Nations Scientific Committee on the Effects of Atomic Radiation & UNSCEAR, 2006)It is estimated that radiation exposure during medical imaging may be associated with 1.5-2% of all cancers in the United States in the future.Before any researches on X-rays, radiologists who were exposed to significant amounts of X-rays were shown to develop severe forms of dermatoses, cataract, haematological disorders and various cancers.This led to the development of a radiation safety principle known as ALARA (as low as reasonably achievable to allow the use of radiation with lowest possible doses required to achieve the desired diagnostic effect(Singh et al., 2015; United Nations Scientific Committee on the Effects of Atomic Radiation & UNSCEAR, 2006; Whaites&Cawson, 1992)

While radiations are extremely useful diagnostically, a study conducted in the UK estimated that up to 20% of medical X-rays ordered are not beneficial and only add to the unnecessary exposure in patients contributing to 100–250 cases of cancer each year in the region (United Nations Scientific Committee on the Effects of Atomic Radiation & UNSCEAR, 2006; White & Pharoah, 2009).

Sneha R Sharma, Freny R Karjodkar al. conducted a study to assess the knowledge regarding adverse consequences of radiological examinations. A questionnaire-based cross-sectional study conducted among patients visiting the dental outpatient department.1,000 adult male and female patients within the age of 2070 years who visited the outpatient department during May–July 2017 were included in the study. Comparison of frequencies of responses to each item with age and gender was done using $\chi 2$ test. For all statistical tests, $p < .05$ was considered statistically significant, keeping α error at 5% and β error at 20%. 85.3% participants had visited a hospital earlier and 69.3% had undergone the procedure of an X-ray earlier. Out of those patients, only 24.7% of the participants had any knowledge about the equipment or the procedure while taking a radiograph. 5.2% of the participants were given any safety measures during the radiological procedure. 14.4% had knowledge of the risks and hazards associated with radiation. This short study showed that there is a need for educating the general population about the hazards and risks associated with radiation

exposure.S Tahira S Naqvi, SyedaWardaBatool, Syed Asad Hasan Rizvi al. conducted a study to assess the knowledge and awareness of the hazards of X-ray imaging among different groups of patients visiting two of the public sector tertiary hospitals in Karachi, Pakistan. A cross-sectional study was conducted in October and November 2018 at two well-known public sector tertiary care hospitals, Ruth KM Pfau Civil Hospital, Karachi and Jinnah Postgraduate Medical Centre Karachi. A nonprobability convenience sampling technique was adapted to recruit 200 participants for the study. A pretested questionnaire was used to assess the knowledge of radiation among patients and their perception regarding the necessary safety measures required to be undertaken during the X-ray imaging procedure. Data were entered and analysed using the IBM Statistical Package for the Social Sciences 17.0 (IBM, Corp., New York, United States). Frequencies were calculated for individual variables. $\chi 2$ test was employed to measure the relationship between categorical variables. A p-value of <0.05 was considered significant. Results Out of 200 participants, 58% knew what radiation was, 42% did not. The relationship between the level of education of patients and the awareness of the term "radiation" was found to be statistically significant (p-value=003). Television was the most common source of information (65.5%). One participant (0.5%) thought that it was possible for X-ray imaging to cause cancer. Similarly, only one participant (0.5%) thought that it could cause decreased fertility, five participants (2.5%) thought it could cause burns, seven (3.5%) thought it could cause cataract, and 20 (10%) were of the view that anemia could be caused. The patients visiting the public sector tertiary care hospitals of Karachi seem to lack the knowledge and awareness regarding the hazards of ionizing radiations and the necessary safety measures required to be undertaken during X-ray imaging.

Need of the study

Surveying patient's knowledge and experiences and documenting their views regarding the radiation hazards and safety measures to protect them from these hazards would, therefore, provide valuable insight which can help to improve the quality and safety of the healthcare system.

Aim and Objective

To assess the level of knowledge and attitude of patients toward radiation hazards and its safety.

To seek association between the knowledge of patients regarding radiation hazards and its safety, with selected demographic variable which is education.

Methodology

Sample and sampling technique

Sample size in present investigation was n=150 while sampling technique used is convenience sampling data was collected from visiting patients to radiology department and exclusion criteria was patients who were not interested.

Design of research

This study comprised of cross-sectional research design and quantitative approach is used.

Procedure

The Questionnaire based survey entitled "Illustrative investigation to Evaluate the Know-how and opinion point of Patients Toward Radiation Exposures and Its Protectionwasconducted among patients visiting in radiology department at Integral University. The study was carried out at Integral University. The questionnaire was self- structured,the questionnaire related to the study was in the form of multiple-choice questions, questionnaire was given to each participant. The questions of the questionnaire are divided into three sections.

Result

Table 1: Gender wise data distribution

S. No	Gender	Count (Out of 150)	Percentage
1	male	104	70%
2	female	46	30%
	Total	150	100%

Table 2: Distribution of respondents according to age.

S. No	Age	Count (Out of 150)	Percentage
1	18–30	32	21%
2	30–45	65	43%
3	45–55	37	25%
4	55–75	16	11%
	Total	150	100%

All respondents were allocated into four groups. Out of total respondents 11% were observed in age group 55–75, age group 45–55 were 25 %, age group 30–45 were 43%, age group 18–30 were 21%.

Discussion

Through this study, we aimed to highlight the knowledge and attitude of patients towards radiation risks and its safety. Our results show that a high percentage of the study population (60%) was unaware of radiation hazards. The study population demonstrated a poor level of knowledge regarding the procedure and the harmful effects of X-ray imaging altogether. These results are consistent with those that we found in the literature.

Conclusion

The overall knowledge of the patients visiting radiology department of SKIMS hospital Srinagar regarding radiation hazards and its protection is unsatisfactory. Safety protocols are less implemented in the hospitals, probably due to lack of knowledge among patients. To ensure the protection of patients from unnecessary repeated radiation exposure, educating patients as well as the health care providers may prove to be beneficial

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