

ORIGINAL ARTICLE

Rationale for the Use of Radiological Investigations; Assessment of Awareness Among Healthcare Workers of a Tertiary Care Hospital in Southern PunjabNAVERA NAVEED¹, RAMEESHA MUSHARAF², RIZWAN SADIQ³, TALHA SAJJAD⁴, MOHAMMAD SUFYAN⁵, ASIA RABBANI⁶¹Post-Graduate Resident, Department of Internal Medicine (Unit-1), Sheikh Zayed Medical College/Hospital, Rahim Yar Khan²Post-Graduate Resident, Department of Anesthesiology, Sheikh Zayed Medical College/Hospital, Rahim Yar Khan³Medical Officer, Department of Cardiology, Sheikh Zayed Medical College/Hospital, Rahim Yar Khan⁴House Officer, Department of Neuro-Surgery, Sheikh Zayed Medical College/Hospital, Rahim Yar Khan⁵House Officer, Department of Pediatric Medicine, Sheikh Zayed Medical College/Hospital, Rahim Yar Khan⁶Medical Officer, Department of Radiology, Sheikh Zayed Medical College/Hospital, Rahim Yar KhanCorrespondence to: Rizwan Sadiq, Email: rizwansadiq94@gmail.com, Cell: +92-301-7611866)**ABSTRACT**

Background: During recent times, radiological investigations have been playing a very beneficial role in diagnosis, confirmation and surveillance of multiple diseases in the medical science; thus increasing our diagnostic and management skills in a positive manner which was not previously possible. Now-a-days, these radiological investigations have become an integral part of our management system due to their easy availability. But this easy availability has increased the chances of misuse of these modalities as well. This cross-sectional study was aimed to assess the rationale for the use of these radiological investigations among our healthcare providers serving at Sheikh Zayed Hospital, Rahim Yar Khan. The study data was collected from study subjects via a pre-designed questionnaire from January 2022 to April 2022. Then the collected data was analyzed through SPSS software. Results of this study, including 250 study subjects (56% males and 44% females; 38.8% consultants and 61.2% PGRs/MOs), showed that the consultants primarily decide about the radiological investigations needed for the patients while the senior PGR/MO play the role in their absence. Majority of the study subjects (90%, n=225) were found well aware of the radiation hazards related to different radiological investigations. Conclusion: The healthcare providers working in different departments of SZH,RYK have enough awareness and knowledge about the rationale for the use of radiological modalities; but were not able to specify the exact limitations for the radiation doses per exposure or total dosage allowed per year to the patients associated with their harmful effects.

Keywords: Knowledge; Radiological Investigations; Health Hazards; Healthcare Workers

INTRODUCTION:

From recent times, radiological investigations have been playing a very beneficial role in diagnosis, confirmation and surveillance of multiple diseases in the medical science. These include X-ray scan, USG (ultrasonography) scan, CT (computerized tomography) scan, MRI (magnetic resonance imaging) scan, PET (positron emission tomography) scan and Scintigraphy (nuclear imaging).

All of these radiological investigations use different types of radiations including sound waves, heat waves, light waves, etc. The term radiation means the form of energy which is generated from a source substance and can pass through a medium or space; thus forming its image on the film.[1]

Out of these different radiations types, some include ionizing particles which impose direct and severe harm to the body by reacting with the contents of body tissues. But the harmful impacts of radiation onto the human body are directly related to the type of radiations used, dose of radiations, duration of exposure, etc. Among the most common health hazards of radiation exposure are different types of cancers including blood cancer (leukemia), skin cancer, cataract formation, fetal anomalies during pregnancy, etc. These cancers develop as a result of genetic alterations or damage to nuclear makeup (DNA) due to these harmful radiations.[2,3]

Out of these mentioned health hazards, studies conclude the frequency or risk of fetal abnormalities (in the form of malformations or in the form of leukemia during early childhood) to be double as compared any harms among adults.[4]

In context to these health hazards as a result of radiation exposure, it is an obvious fact that the radiological modalities should be utilized very cautiously and in a very judicious way. But some healthcare workers do not take these radiation hazards into account and go on prescribing these radiological investigations which results in serious outcomes. This negligence is observed partly due to lack of appropriate knowledge regarding these radiations (their dose, duration of exposure, possible negative outcomes, etc).

Hassan Javed et al conducted such a study in 2019 which concluded in a perception among radiologists that there is a large number of physicians routinely prescribe radiological investigations that are not necessary.[5]

This study aimed to assess the rationale for the use of radiological investigations and awareness level about its health hazards among doctors of this hospital in Southern-Punjab.

MATERIALS & METHODOLOGY

The cross-sectional observational study was conducted at Sheikh Zayed Medical College/Hospital, Rahim Yar Khan. After informed verbal consent, 250 consultants (including physicians, pediatricians, pulmonologists, obstetricians & gynecologists) were included in this study.

Data was collected on pre-designed questionnaires by interviewing the study subjects; from January 2022 to April 2022. Then the collected data analyzed through SPSS software version-10.0 where categorical variables were described in terms of frequencies and percentages.

Ethical approval was gained from the institutional review board and the confidentiality of data was maintained throughout the study.

RESULTS

The study subjects included in this study consisted of medical officers, post-graduation residents, assistant professors, associate professors and professors. Majority of them i.e. 56% (n=140) were males while 44% (n=110) were females.

A large number of the study subjects were serving in outdoor and emergency divisions of different departments as consultants i.e. 38.8% (n=97); while the remaining number of study subjects 61.2% (n=153) included post-graduation residents and medical officers. Most of the time, only consultants advised special radiological investigations while PGRs/MOs were not directly allowed to decide about special investigations for patients.

Most of the study subjects i.e. 90% (n=225) were very well aware about the radiation hazards of such radiological investigations including X-ray scan, USG (ultrasonography) scan,

CT (computerized tomography) scan, MRI (magnetic resonance imaging) scan, PET (positron emission tomography) scan and Scintigraphy (nuclear imaging).and did consider harmful aspects of these radiations while prescribing investigations. However, only a few of them had complete knowledge about the estimated radiation doses per exposure; associated with these specific radiological studies.

Moreover, majority of clinicians 80% (n=200) voted in support of the fact that complete information regarding indications of each radiological investigation should be provided to the radiologists for better reporting of prescribed radiological studies. Additionally, many of the study subjects were in support of the opinion that it will be more advantageous for the patients if the benefits of specific imaging study are pre-discussed with the radiologists; based on the clinical history and clinical presentation of the patient.

DISCUSSION

Diagnostic radiology is one of the most rapidly advancing filed. Commonly utilized radiological investigations include X-ray scans, fluoroscopic studies, CT scans, MRI scans, ultrasound scans, nuclear imaging studies and PET scans. This cross-sectional study was aimed to assess the knowledge/awareness among the healthcare professionals working at Sheikh Zayed Hospital, Rahim Yar Khan. The subjects included in this study were working at different ranks i.e. consultants, PGR/MO. All of them voluntarily participated in this study. It was found that most of the time, in majority of the wards, consultants advise the necessary radiological investigations (fluoroscopy, CT scan and MRI). While in emergency department, this decision is taken up by the senior PGR/team leader; in the absence of consultant. The results of this study showed that most of the clinicians have adequate knowledge and awareness about the efficacy of different radiological investigations and that they have very positive attitude towards them. Moreover, they also consider the harmful effects of these radiological investigations while prescribing these to any patient. These results are in contrast to a study conducted by Günalp M, Gülünay B, Polat O, et al at emergency department of a university hospital but are in accordance with a study conducted by Salaam AJ, Iyua KO, Danjem SM, et al in a hospital setting of Nigeria.[6,7]

Furthermore, our study showed that our study subjects were not able to describe the specific radiation doses per exposure; related to different radiological modalities. Nor they could elaborate the maximum radiation dosages allowed to the patients, keeping them in safety limits. The same results were observed by Arslanoğlu A, Bilgin S, Kubal Z, et al and by Lee CI, Haims AH, Monico EP, et al during their studies.[8,9]

In a study conducted at a hospital in Zambia, it was found that their healthcare providers (35.3% and 13.2%) were not even able to appreciate MRI and USG, respectively, as modalities with non-ionizing radiations; thus, having minimal harmful effects to the patients.[10] These results can be due to the fact that the study setting didn't have MRI and USG facilities. While, majority of our study subjects were very much able to differentiate between

investigations using ionizing and non-ionizing radiations. This can be attributed to the easy availability of almost all the radiological investigations and partly, to the mandatory rotation of Radiology during residency.

Limitations of the study are that we could not use a comprehensive questionnaire for fear of lack of response. Nonetheless the results are useful to create awareness among relevant individuals.

CONCLUSION

It was concluded that most of the healthcare providers at SZMC/H, Rahim Yar Khan have appropriate basic knowledge about the rationale for the use of radiological investigations and their associated health hazards. But, it would be more beneficial if they are further guided about the safe radiation dosages during single exposure according to the condition of patient; thus, helping them decide about the pros and cons of prescribed investigations in a better and more efficient way possible.

Recommendations: Large scale studies are needed in order to generalize the findings of this study. Secondly, different training workshops can be organized at institutional levels in order to provide more information to the healthcare providers regarding the efficient, safe and effective use of different radiological investigations.

Conflict of interest: None

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