

Original Research Article

Knowledge and awareness of the radiation safety among the medical students and resident doctors

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Abstract: In day to day medical investigations radiations now become a must for the diagnosis. The radiations having most of the health risk for the doctors in constant contact with such procedures. During the learning period, the medical students were unaware of the risks of radiation and therefore they do not take the necessary safety precautions. The present study was done to assess the knowledge and awareness of the medical students regarding radiation safety precautions. The study was done including of 75 medical students and 45 resident medical doctors regarding knowledge and awareness of the radiation safety. The study was done with the help of questionnaire inclusive of 12 questions consisting of knowledge of radiation safety principles, barriers to protect transfer of radiations, precautions to be taken, hazards of radiation, etc. On comparison of the scores of the medical students and resident doctors, it was found that the scores were almost equal and both the groups were having similar level knowledge and awareness regarding radiation safety (students t test, $p > 0.05$). But the scores for both the groups were low indicating the knowledge level was low especially for the safety precautions. The medical students and resident doctors were having less knowledge and awareness regarding radiation safety.

Keywords: Radiation safety, Health risk, Radiation

INTRODUCTION:

Investigative imaging procedures employed in medicine add the maximum source of radiation to which human beings are constantly exposed to apart from regular background radiation from the nature. Most of the methods in diagnostic radiology and nuclear medicine can create ionizing radiations whose dose be governed by on various factors which are associated to the patient and apparatus [1-3].

Clinicians usually lack awareness concerning radiation dose, the consequent damaging effects to the patients produced during radiological investigations and the radiation safety precautions [3, 4]. During the learning period, the medical students were unaware of the risks of radiation and therefore they do not take the necessary safety precautions. The present study was done to assess the knowledge and awareness of the medical students regarding radiation safety precautions.

MATERIALS AND METHODS:

The study was done including of 75 medical students and 45 resident medical doctors regarding knowledge and awareness of the radiation safety. The study was done with the help of questionnaire inclusive of 12 questions consisting of knowledge of radiation safety principles, barriers to protect transfer of radiations, precautions to be taken, hazards of radiation, etc. approval of the ethical committee was taken before start of the study and informed consent was taken from all the participants. The questionnaire was distributed to all the participants in a common meeting hall at the same time and 15 minutes were given to mark their responses and submit to the concerned authority.

RESULTS:

The responses of all the participants were collected and tabulated. Out of 75 medical students; 71 were considered for the study as 4 students were marked multiple answers. Also out of 45 medical residents only 43 were taken for the study as 2 residents

were kept most of their responses blank. On comparison of the scores of the medical students and resident doctors, it was found that the scores were almost equal and both the groups were having similar level

knowledge and awareness regarding radiation safety (students t test, $p > 0.05$) (Table 1). But the scores for both the groups were low indicating the knowledge level was low especially for the safety precautions.

Table 1: Comparison of the scores of the radiation safety among the medical students and resident doctors

Group	Number of participants	Mean \pm SD	T value	P value
Medical students	71	9.11 \pm 1.69	0.8030	>0.05*
Resident doctors	43	8.79 \pm 2.59		

SD= Standard deviation.

*Statistically not significant.

DISCUSSION:

Diagnostic radiology is essential in the clinical assessment of the patients and aids in the precise diagnosis and management of diseases and in follow up of the treatment [3, 5]. Radiation dose from medical imaging has become a argument and a matter of debate in the press. This is the result of recent articles on the increased cancer risks associated with diagnostic medical imaging [3]. Ionizing radiation has unwanted biological effects on living tissues and these adverse effects vary according to the dose of the radiation and duration of exposure [3]. These contrary effects vary according to dose and duration of exposure; however, the threshold dose for causing cancer in humans is as yet unknown [5].

The inventers of radiology were exposed to high doses of radiation, leading to various dermatoses, hematological disorders, and cataract or cancer diseases. The doses absorbed by the first radiologists are estimated at 1 Gy/year [6]. The occurrence of the adverse effects of X rays had generated scientific research in radiation protection. As a result, personal radiation protective equipment was presented and regulations were passed that defined the limit values and recognized guidelines for radiological guard of the medical staff and the patient [7].

The US National Council on Radiation Protection and Measurement had stated that medical x-rays and nuclear medicine account for only 15% of all radiation exposures. Likewise, in the UK, estimated 100-250 deaths occur each year from cancers directly related to medical exposure to radiation. More alarm has recently been declared in recent studies that the knowledge of referring doctors about radiation doses. Such evidence may be of particular relevance when the expansion of imaging technology is considered. The advent of multi detector row CT (MDCT) has allowed for faster imaging and the use of more complex imaging protocols [8]. There is direct association between exposure to radiation and advance of cancer and several studies have proven it. Evidences suggest that exposure of Fetus in Utero may lead to wide range of malformations. Children in the growing age (upto 10

years) are at higher risk when exposed to radiation and have a greater likelihood of 2-3 times more than adults in developing leukaemia [9, 10].

The level of awareness regarding radiation protection affects the staff behavior. If they have not enough information related to radiation safety, their action will not be safe and be resulted in adverse effects [11-13]. Risks from exposure should be made more widely available to junior doctors. According to the Council of the European Union Medical Exposure Directive, a course on radiation protection should be part of the basic curriculum of medical schools. Referring doctors should be educated on the basic aspects of radiation protection, radiation doses and their effects.

CONCLUSION:

The knowledge and awareness of the medical students and resident doctors about radiation safety should be improved through seminars, symposiums, continuing education program or any other methods. So that it could be beneficial to their safety.

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