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Original Research Article

Knowledge of medical students and nursing staff about the use of radiations for the diagnosis

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Abstract: In medical field X ray are very important in the diagnostic procedure. All the personnel involved in the medical field should have sufficient knowledge and awareness about its use in the diagnosis and treatment planning. The present study was done to assess the knowledge of the medical students and nursing staff regarding the use of radiation in the diagnosis procedure. 121 medical students and 79 nursing staff were participated in the study. The medical students were of the 3rd and final year students and the nursing staff of the medical college and also from the nearby multispecialty hospitals. The study was done with the help of questionnaire having 16 questions. The questions were prepared to study the knowledge and awareness of the participants including the physics of the radiation useful in the diagnosis, type of radiations, adverse effects, dose of radiations, precautions to be taken, etc. The statistical analysis was done using IBM SPSS statistics version 17 with the help of student's t test. The results of the study had shown that, medical students were having more knowledge and awareness of the basics of the radiations and their use in diagnostic procedures as compared to the nursing staff and the difference was found to be statistically significant (Student's t test, $p<0.01$). Though knowledge of the medical students shown more than nursing staff, it should be improved. The medical students and nursing staff having knowledge and awareness regarding use of ionizing radiation, but it still need to be improved.
Keywords: Radiation, Medical students, nursing staff

INTRODUCTION:

In our living environment many types of radiations are present. Light and heat from the sun are natural forms of radiation that are important to our survival. Some types of radiations are generated by man, like microwaves for cooking, radar for navigation, radio waves for communication and X-rays for medical investigations. The creations of radioactive ingredients are additional examples of the diverse forms of radiation. Some of these substances arise naturally during the atmosphere; others have been created by man [1, 2].

Radiation has been extensively used in the diagnosis and management of many diseases. Diverse imaging modalities involve radiation, and in particular, high radiation- dose examinations such as computed tomography (CT) are increasingly used. Since radiation has verified adverse organic effects that vary with the dose and duration of exposure, the level of clinician awareness of such matters including associated risks and safety is important [1-3].

Assessing areas of such knowledge deficiency among medical students and nursing staff could help raise awareness and improve training about radiation protection. The present study was done to assess the knowledge of the medical students and nursing staff regarding the use of radiation in the diagnosis procedure.

MATERIALS AND METHODS:

121 medical students and 79 nursing staff were participated in the study. The medical students were of the 3rd and final year students and the nursing staff of the medical college and also from the nearby multispecialty hospitals. Medical students were constantly using the radiations for the diagnostic

procedures; therefore they were taken in the study. The nursing staff also involved in the various activities of the diagnostic procedures, also the nursing staff usually the most contacted person by the patient and patient relatives and the source of knowledge for the medical students as well as to other staff of the hospital. The study was done with the help of questionnaire having 16 questions and they were of the yes/ no type of questions. Each of the correct answer were given score 1 and wrong answer given score zero. The questions were prepared to study the knowledge and awareness of the participants including the physics of the radiation useful in the diagnosis, type of radiations, adverse effects, dose of radiations, precautions to be taken, etc. The statistical analysis was done using IBM SPSS statistics version 17 with the help of student's t test.

RESULTS:

All the data were collected and analyzed. Out of 121 medical students, 116 were chosen for the analysis as 05 medical students filled multiple answers or kept most of the questions blank. Similarly out of 79 nursing staff, 76 were remaining for the analysis. The results of the study had shown that, medical students were having more knowledge and awareness of the basics of the radiations and their use in diagnostic procedures as compared to the nursing staff and the difference was found to be statistically significant (Student's t test, $p<0.01$) (Table 1). Though knowledge of the medical students shown more than nursing staff, it should be improved.

Table 1: Table showing comparison of the scores of the medical students and nursing staff

Group	Number of participants	Mean ± SD	T value	P value
Medical students	116	12.13 ± 1.75	2.7079	<0.05*
Nursing staff	76	11.40 ± 2.33		

SD= Standard deviation

*statistically significant

DISCUSSION:

The usage of radiation in medicine has directed to major enhancements in the diagnosis and management of human diseases [4]. Radiation is commonly categorized into two types like ionizing and nonionizing radiation. "Ionizing radiation transfers enough radiation to the body upon absorption to cause chemical changes, or ionization of the atoms and molecules in the tissue or organ. The examples of ionizing radiation include X-rays, alpha rays (protons), beta rays (electrons), and gamma rays. Exposures to nonionizing radiation are much more common and usually less hazardous. Forms of nonionizing radiation contain all those comparatively low energy, electromagnetic radiations such as microwaves, infrared, light (including lasers), and ultraviolet [5, 6].

The term radiation covers a widespread spectrum of diverse forms of energy most of which have been suspected to cause ill health to human-beings. The effects of low level exposure to ionizing radiation are a concern to large number of people. Radiographers are not very awareness of radiation doses, and that there is a lack of communication between radiographers and patients relating to radiation and its possible effects [7, 8].

Information on radiation dose and the associated 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 [7, 8]. Numerous medical techniques, including angiography, computed tomography (CT), fluoroscopy and radiographic imaging, utilize ionizing radiation. The chief purpose of radiological imaging is to achieve the optimum quality image using the minimum possible dose. However, the dose limits allowable by international authorities may exceed in some interventional applications and in some cases [9].

Outside certain thresholds, radiation can weaken the working of tissues and/or organs and can produce acute effects such as skin redness, hair loss, radiation burns or acute radiation syndrome [10]. Ionizing radiation has dangerous effects on biological systems. There are two forms of radiation effect on human health called the stochastic effect and the deterministic effects. Stochastic effect is an independent-dose effect and can basis illness such as cancer. Dependent-dose effect are called deterministic effects and the effects are instant such as radiation burn and acute radiation syndrome[10-11].

In the present study, it was found that the medical students and nursing staff have knowledge of the use of the radiation in the diagnosis procedures, but it needs to be updated according to the recent findings.

CONCLUSION:

The medical students and nursing staff knowledge regarding radiation should be improved by conducting awareness program, symposiums, seminars,

etc. Also they should be given knowledge regarding advancement in the use of radiations in the diagnostic procedures.

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