Original Article

Attitude towards Radiology & Knowledge Regarding CT and M.R Scans in Medical Students

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ABSTRACT

Aims: To assess the attitude towards radiology of undergraduate medical students of DUHS and the level of knowledge of common imaging techniques (CT & MR Scans).

Study Design: A Descriptive Cross-Sectional Study

Place and Duration of Study: This study was carried at Dow University of Health Sciences(DUHS), Karachi from May 2009-October 2009.

Methods & Materials: The study among 300 medical students of Dow University of Health Sciences(DUHS). Systemic random sampling was carried on pre-tested questionnaires among the batches of students attending clinics. Statistical analysis was done on SPSS version 16.

Results: 97.3% students stated that radiology teaching is not adequate. 93% students stated that radiology should be taught along with basic sciences' course. 63% and 69% of the participants knew about the indications of CT & MRI respectively.

Conclusion: The perception of the Undergraduate medical students towards acedemic teaching of radiology during their clinical tenures in medical schools and their knowledge, indication and risk factors regarding CT & MR scans is scares which needs to incorporated in the curriculum but the knowledge regarding skills involved ith them including radiation exposure was 45% & 31% respectively.

Key Words: Radiology, knowledge, CT scan, MR scan

INTRODUCTION

In Pakistan, which is a developing country, while the population is increasing at a rapid rate, the use of diagnostic imaging services has also increased. The challenge for all medical educators is to educate the future medical professionals about cost-effective application of new diagnostic and therapeutic imaging procedures.

It was found that the students believed in the relevance of radiology in the medical school curriculum and its importance to future medical practice. Knowledge has been defined as the capacity to acquire, retain and use information (Bacdran,1995). [1] Attitudes are learned evaluative concepts associated with the way people think, feel and behave

(Baron and Byrne, 2003).Knowledge through education is a good tool to change negative

attitudes of some radiographers. [2] It has been previously shown that integrating radiology teaching into the first year of medical education has an immediate positive effect on medical students' attitudes toward the practice of radiology.[3] Magnetic resonance imaging (MRI) has been in clinical use for more than two decades. At the time of introduction of this important diagnostic tool, there were many concerns about its safety and the effects of the different types of magnetic fields utilized in MRI on the body tissues.[4] One could hardly imagine a less auspicious time to argue that radiology should play a greater role in the medical school curriculum.[5] Today medical students are overwhelmed by the growing load of information they are expected to assimilate. In the current era of modern, organ imaging, radiological investigations play a central role in patient management.[6] Inspite of the innovations during the last decades, radiology has not been completely incorporated into the medical college curricula and still an adjunct subject in the syllabus rather than one of the core subject.[7] The physicians are biased by a lack of exposure to radiologists during their academic years of medical college.[8] It is likely that greater exposure to radiology for all medical students, not only those interested in radiology as a career, is advantageous to the specialty.[9]

As all the other radiological techniques, CT & MR Scans are also becoming increasingly popular to aid in forming & confirming diagnosis. The advent of CT scan has revolutionized diagnostic radiology. Since the inception of CT in the 1970s, its use has increased rapidly.[10] In clinical practice, MRI is used to distinguish pathologic tissue from normal tissue. One advantage of an MRI scan is that it is believed to be harmless to the patient. It uses strong magnetic fields & non-ionizing radiations in the radiofrequency range as compared to CT scans & traditional X-rays which involve doses of ionizing radiation and may increase the risk of malignancy especially in fetus. It is best suited for cases when a patient is to undergo the exam several times successively in the short term. MRI is definitely contraindicated in any patient who may have a magnetic foreign body, cardiac pacemakers, magnetic intracranial aneurysm clips, & cochlear implants. The

safety for the fetus during pregnancy is not known. Consequently 1st trimester MRI studies should be avoided if possible.

Hence, a good foundation & understanding of radiology is essential in all practice areas of clinical medicine. Physicians requesting radiological investigations need to understand which modalities are the most suitable for given clinical situation, together with their limitations & contraindications. There is no such system in our colleges to teach students these commonly requested investigations, and when students take their clinical rotations, mostly it is expected from them that they must have learned this all beforehand. Learning this all may be relegated to as incidental exposure during medical or surgical rotations; or a few students themselves take optional electives. Hence, students are expected to learn by "osmosis" from their attachments in other specialties.

A strong undergraduate training in radiology is needed which will result in better & more efficient patient care and will minimize unnecessary tests, reducing the potential harm to patients and the depletion of resources.[11]

The objective of this study was to know the attitude towards radiology of undergraduate medical students and to investigate their level of knowledge of the becoming popular investigations CT & MR Scans.

METHODS AND MATERIALS

A descriptive Cross-sectional study among 300 medical students of Dow University of Health Sciences(DUHS). Systemic random sampling was carried on pre-tested questionnaires among the batches of students attending clinics. The study period was May 2009-October 2009. Statistical analysis was done on SPSS version 16.

A questionnaire measured medical student's attitude towards radiology and their knowledge of the now common investigations- CT & MR Scans.

Questionnaire was administered to 300 students (150 each from the two colleges SMC and DMC), by stratified random sampling technique to avoid any bias.

Questionnaire comprised of two sections; section I consisted of 7 questions and was focused to assess the attitude towards radiology. Section II consisted of 9 questions of which 3 were of the multiple-choice type. This section was used to test knowledge of the common investigations- CT & MR Scans.

RESULTS

300 students from the clinical years participated, 150 each from SMC & DMC. Random sampling was done.

69% respondents stated that they are about as familiar as with other areas and 25% stated that they have barely been introduced.

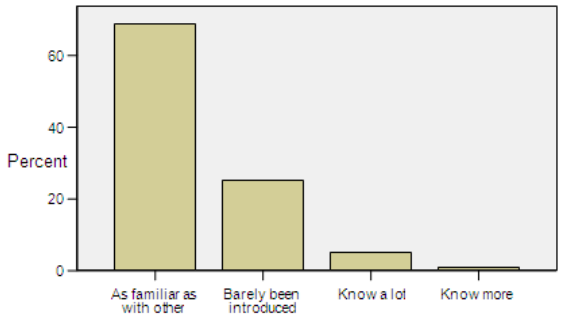

Figure No. 1: Knowledge about radiology

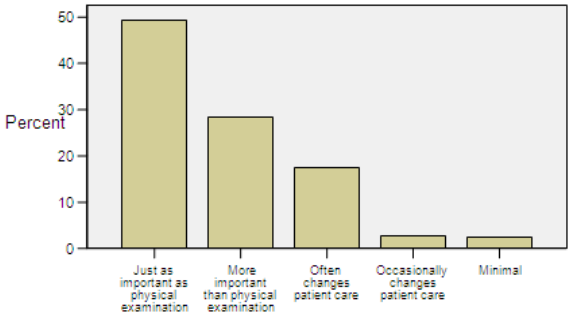

Figure No. 2: Impact of imaging techniques on other areas of medicine

36% of the students answered radiology was intrinsically interesting & 17.3% were of the view that radiology has a substantial influence on other areas of medicine.

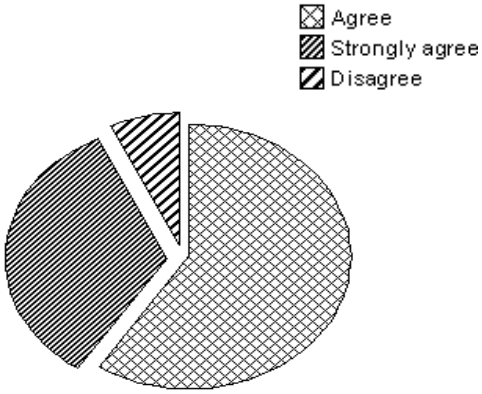

Figure No. 3 Imaging techniques should be a part of basic science course

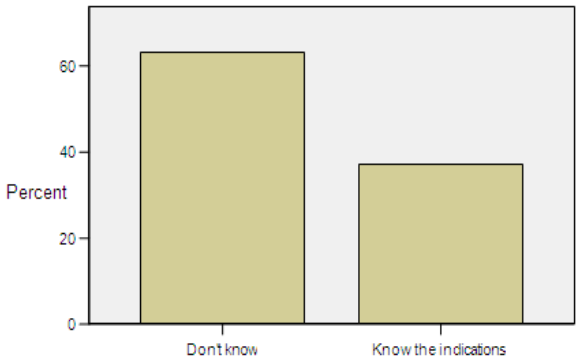

Figure No. 4: Knowledge about the indications of CT scan

When evaluated for knowledge of CT & MR Scans the results were:

63% of the participants knew about the indications of CT scan.

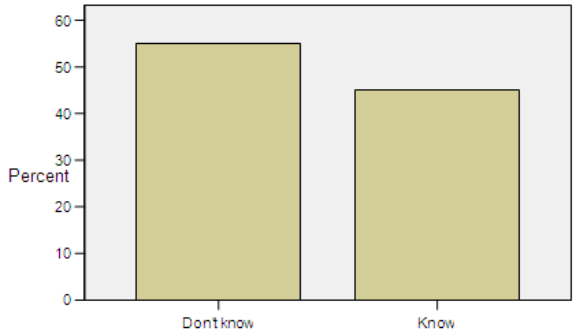

Figure No. 5: Knowledge of CT scan risks

63% respondents knew the contraindications of MR scan.

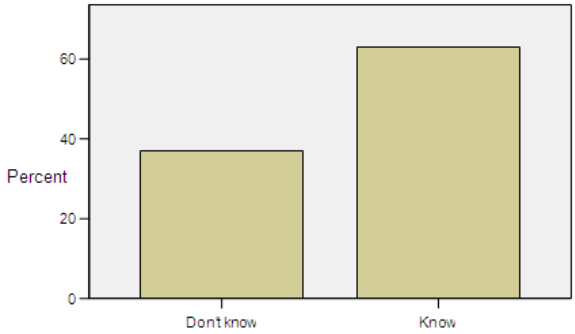

Figure No. 6: Knowledge about contraindications of MR Scan

31% knew that MRI carries no radiation hazards.

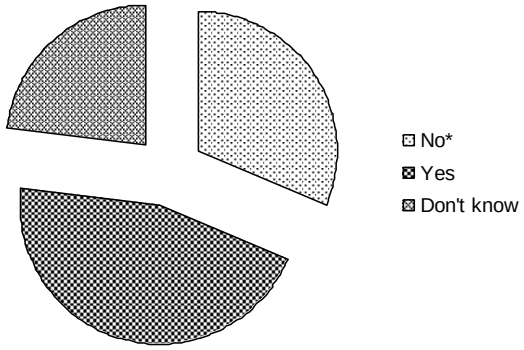

Figure No. 7: Radiation hazards with MRI

DISCUSSION

The ultimate aim of medical student radiology teaching is to produce a clinician that would be aware of indications for, values, and limitations of radiology in the clinical management of patients.[6] In order to produce a clinician that can critically see the role of radiology in patient care, there should be a well-structured radiology teaching program for medical students, especially of the clinical years.[7] The practice of diagnostic radiology has changed considerably in both technique and application within the last 15 years. With the advancement of technology, the practice of radiology includes not only convention methods but new imaging processes such as computed tomography and magnetic resonance imaging.

When CT became available in 1970s, it enabled to establish diagnosis with unprecedented speed and accuracy. Indeed… indiscriminate use of this test is almost a routine. [8] Yet the use of CT continues to spiral upwards. Many patients undergo 2 or 3 (CT examinations in the same day and then have serial scans during follow-up) [14]

The proportion of CT examinations in children is increasing rapidly.[15] Even worse, a panel of expert pediatric radiologists concluded that up to 30% of CTs in children are unnecessary. Likewise, MR procedures have been used for over 20 years. This modality is considered relatively safe and holds great promise. Yet, MRI has a number of risks.[17]

Moreover, they must know the risks associated with these investigations, as they are expected to obtain informed consent for the investigation explaining the tests and risks to their patients for non-intervention or non-invasive radiology investigations, such as CT & MRI.

In this study, the imaging techniques in particular CT &MRI, 69 % (N=300) of the students responded that they are about as familiar as with other techniques. 25% (N=300) said they are barely been introduced. This reflects the lack of radiology teaching facilities in our colleges. Likewise, 55.3% (N=300) stated that they have been introduced peripherally as a minor part of another course while 26.3% (N=300) said they have not been exposed to these techniques. A major problem in teaching radiology is the lack of a formal curriculum. Radiology has been taught in rather haphazard manner without good continuity and progression. There have also been some redundancies in lectures.[12]

Students perceive radiology as an interesting matter, 97% (N=300) considered it important. Of them 38.7% said it is interesting only as it relates to other areas of medicine. Comparably, 36.3% stated it's interesting in its own right. This shows that, whatsoever, students consider radiology as an important entity, but exposure to it is very much limited.

It is likely that greater exposure to radiology for all medical students, not only those interested in radiology as a career, is advantageous to the specialty.[9]

Only 5.7% (N=300) respondents collectively from both medical colleges went for radiology electives. In most traditional medical school curricula (all over the world), radiology is not formally introduced to students until their clinical rotations.[18] About 94.3% (n=283) who have not done electives in radiology, interestingly, 55.5% stated that they may take it as electives. While only 16.3% said they would definitely go for radiology electives. 49.3% (N=300) respondents stated that imaging techniques are just as important as physical

examination and 28.3% (N=300) were of the view that these are even more important than physical examination. The most encouraging point for the radiology department was that only 7% (N=300) disagreed while the remaining 93% agreed that radiology should be included in basic sciences' course. A research conducted in Brazil showed that inclusion of sectional anatomy training in medical school curricula has great impact on subsequent CT interpretation.[19] CT ordering practices varied with specialty.[20] MRI procedures are usually taken very comfortably. [21] Computed tomography (CT) is one of the largest contributors to man-made radiation doses in medical populations. The principal concern regarding radiation exposure is that the subject may develop malignancies.[22]

So it was really a good response that students were of the view that they should get exposure to radiological techniques along with their basic science's subjects.

Multiple choice questions were designed to assess the level of knowledge of the indications and risks related to CT & MR scan. 63% (N=300) did not know the indications to order CT scan. 55% (N=300) did not know the risks related to CT scan. Surprisingly 63% knew the contraindications of MR scan.

Those who responded with 50% correct response were considered to know the answers.

The biggest hazard with CT scanning is radiation. Yet 36% (N=300) said that CT scan is safer to use for patients undergoing many studies as compared to 31% (N=300) for MR scan & 33% (N=300) for radiographs. Cumulatively, 69% (N=300) did not know that there is associated risk of radiation exposure in using CT for patients undergoing many radiological investigations.

75.7% students thought MR I scan is the most expensive of the three- CT, MR, and radiographs.

CONCLUSION

To conclude medical students have a limited exposure to radiology teaching during their years of study in medical college & this should be included in basic sciences curriculum.

When evaluated for knowledge regarding CT & MR scan the commonly requested imaging techniques these days reflected the lack of knowledge of the indications & risks involved with these revolutionary techniques.

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