ASSESSMENT OF LEVEL OF AWARENESS AND KNOWLEDGE OF INTERVENTIONAL RADIOLOGY AMONG MEDICAL STUDENTS AT A PAKISTANI INSTITUTION

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Date Received:
May 06, 2014
Date Revised:
December 22, 2015
Date Accepted:
January 02, 2016

ABSTRACT

Objectives: To evaluate the level of knowledge and interest in Interventional Radiology (IR) among medical students at a Pakistani Medical Institution.

Methods: After ethical review board approval, a cross sectional study was conducted based on a survey distributed among 600 medical students at a Pakistani 5 year medical school. 288 (48 %) responses were received. Survey was based on 16 questions assessing knowledge, interest and perception of Interventional Radiology.

Results: Among 288 respondents, 112 (39%) reported poor knowledge regarding IR; 132 (45%) had never been exposed to IR. Only 46 (16%) students chose to consider a career in IR. Main reasons for not considering a career in IR were lack of knowledge (49 %) or lack of interest (34%). Hundred students (34%) could correctly identify at least one IR procedure; 192 (66%) students were unclear regarding routine duties of Interventional Radiologist as part of a multidisciplinary team; 192 (66%) students stated that a 2 week radiology rotation would be sufficient; 168 (58%) stated that a mandatory 2 week core rotation in IR should be incorporated. IR lectures were rated as the most effective means of learning.

Conclusion: Although level of knowledge and exposure to IR among medical students was suboptimal, they showed interest in learning more about this specialty. This deficit needs to be addressed in the undergraduate medical curriculum, not only to attract future innovators for continued growth of this specialty, but also to increase awareness among future referring physicians.

Key Words: Interventional radiology, Awareness, Medical students

This article may be cited as: **Rehman IU, Ahmed M, Assad S, Rahman MA, Rahman DT, Jehangir M. Assessment of level of awareness and knowledge of interventional radiology among medical students at a Pakistani institution. J Postgrad Med Inst 2016; 30(1): 66-72.**

INTRODUCTION

In the setting of rapid advances in the worldwide health care industry and healing arts, there has been a shift of the role of radiology from a peripheral entity to a much more involved, central core specialty.

The benefits of IR procedures are substantial. There are reports on the International level which have shown that the adoption of IR procedures can lead to decreased mortality, decreased need for hospital stay, decreased morbidity and decreased costs, which have always been the goals for quality health care providers[1].

Fundamental to the survival of this specialty is a steady supply of radiologists who are trained to practice IR[2]. Undergraduate medical students are the forthcoming professionals who may take the role of radiologists, or referring physicians [3]. However, despite ever-increasing clinical dependence on diagnostic imaging, radiology teaching is highly under-represented in the current undergraduate medical school curricula.

This survey aims to address this deficit in the radiology curriculum with special reference to IR by assessing the level of interest and knowledge among medical students at a single Pakistani medical institute. Preferred modes of learning and exposure to radiology and IR were also evaluated which may be incorporated in the integrated medical curriculum in future.

METHODOLOGY

Institutional review board approval for the study was obtained. A cross sectional study was conducted based on a survey adapted from a similar study that was gaug-

ing awareness and knowledge in medical students at a Canadian Institution [3]. Survey was based on 16 questions assessing knowledge, interest and perception of Interventional Radiology. (Appendix I) A hard-copy format of survey was distributed among 600 medical students at a 5 year medical school. Students were given 1 week to provide the responses from 1st June 2013 to 7th June 2013. All submissions were anonymous. A total of 288 (48%) responses were received. Percentage of the respondents who answered each question was calculated.

RESULTS

We had 288 respondents from a 5 year medical school at a Pakistani medical college; among which 32.6 % (94/288) were in first year, 28.1% (81/288) in their second, 8% (23/288) in third, 23.3 % (67/288) in fourth and 8% (23/288) of respondents in their final year (Table 1). 39% (112/288) reported poor knowledge, 14.9% (43/288) had no knowledge about the modality with only handful (4%) reported as having excellent knowledge (Table 1).

Among the respondents 77.4 % (223/288) have not completed or had no plan to do an elective in radiology (Table 1). Only 19% said yes when asked to pursue their career in Radiology, 47% said no while 34% were unsure (Table 1). Only 16 % of our respondents were eager to pursue Interventional Radiology (IR) as their future career (Table 1). The most common cause in not pursuing IR as career was that 49 % (141/288) did not know about the modality, 34.7% (100/288) didn't find it interesting and 9% said that the life style doesn't suit them. When asked about the Residency program of IR; 33% respondents thought that to follow IR one must do residency in radiology, 52% replied to do residency in both radiology and surgery whereas 15% stated to do residency in surgery. (Table 2)

When asked about the most commonly performed procedure, the most common procedure pointed out was angiography. During the clinical rotations 58% said that they have never seen the patients treated by IR, 29% said yes while 13% respondents were unsure.

When asked about IR clinical duties, 51% (148/288) thought that interventional radiologists have outpatient clinics, 34.7% (100/288) thought interventional radiologists did ward rounds in the hospital, and 37% (107/288) thought they had admitting privileges (Table 2). Respondents were also asked to indicate if they wanted to have a mandatory 2 weeks radiology rotation during their clerkship for which 66.7% said yes, 12.2% said no and 21.2% were unsure. Good response was seen when asked if they agree to doing a 2 weeks IR selective rotation during their 6 weeks rotation in surgery where 58.3 % agreed to this suggestion. (Figure 1).

When inquired how they came to know about IR training, the most common responses of respondents were radiology electives (7%, 20/288), IR lectures (16%, 45/288), ward rounds (10%, 29/288), self-directed research on the specialty (11%, 32/288), problem-based learning tutorials (8.3%, 24/288), and multidisciplinary meetings (2.1%, 6/288). A total of 46% (132/288) had no exposure to IR. (Table 3)

DISCUSSION

Although IR has become a core sub-specialty and an integral part of healthcare in the west, its availability in Pakistan is still very limited. In our environment funding is a major factor as many patients have difficulty to pay for procedures. Perhaps this is a result of a lack of recognition of the role that this field plays. There are only very few individuals with quality training who are in a position where resources are available to impart training and care. A lack of proper instruction and formal fellowship positions exists and this deficit is slowing the expansion. Human resources that are needed to drive this growth do not currently exist. Another major factor is the lack of support through referral. Many physicians may be keen to keep their patient in their care, including opting for procedures that would maintain that relationship, as opposed to 'outsourcing' to others. It will take time to build the rapport and trust in this field of care.

Given these challenges, it may seem an uphill task. Increasing education and awareness amongst the upcoming physicians regarding IR is one of the steps towards achieving this goal. Exposure to IR at an earlier stage in the medical education of students may help develop an increased interest in radiology as a future career [4]. When compared to studies conducted at Canadian and American institutes [3,5], our medical student population response laid in between these two studies at 45 % when asked if they had never been exposed to IR. When asked about their knowledge level there was an improvement over their international counterparts, at 39% stating poor knowledge against 63- 66 % in Canadian[3] and European[6] studies. Similar to the Canadian medical student population studies[2], our medical student population showed relatively limited interest in further pursuing IR as a future career (16%) and the reason of majority of those that responded was due to lack of knowledge (49% as compared to 48%) and lack of interest (34 % compared to 43 %). These figures depict the deficit of a proper educational experience with IR during medical college.

Currently there are mandatory radiology rotations in medical schools of about 2 weeks in a five year span, however how the curriculum of these rotations is setup may have a major bearing on how the specialty is perceived. Certainly the availability of exposure to IR is lim-

Table 1: Demographics of respondents as they pertain to knowledge and general interest in diagnostic and interventional radiology (IR)

Questions	Possible responses	Response count (%)
Years of Medical school	1	32.6
	2	28.1
	3	8
	4	23.3
	5	8
Self Reported Knowledge of IR	Excellent	3.8
	Good	11.8
	Adequate	30.6
	Poor	39
	No knowledge	14.9
Completed or plan to complete an elective in Radiology	Yes	22.6
	No	77.4
Would you consider to pursue Radiology as a career	Yes	19
	No	47
	Not sure	34
Would you consider to pursue Interventional Radiology as a career	Yes	16
	No	43
	Unsure	41

Table 2: Respondent's knowledge of tasks performed by interventional radiologists

Statement presented in survey	Possible responses	Response count (%)
An Interventional Radiologist must complete residency in	Radiology	33
	Radiology and Surgery	52
	Surgery	15
Interventional Radiologist have outpatient clinics	Yes	51
	No	49
Interventional Radiologist did wards rounds	Yes	34.7
	No	65.3
Interventional Radiologist have admitting privileges	Yes	37
	No	63

Figure 1: Respondents' opinion regarding doing a 2 weeks IR selective rotation during clerkship as part of Medical School Clerkship Curriculum.

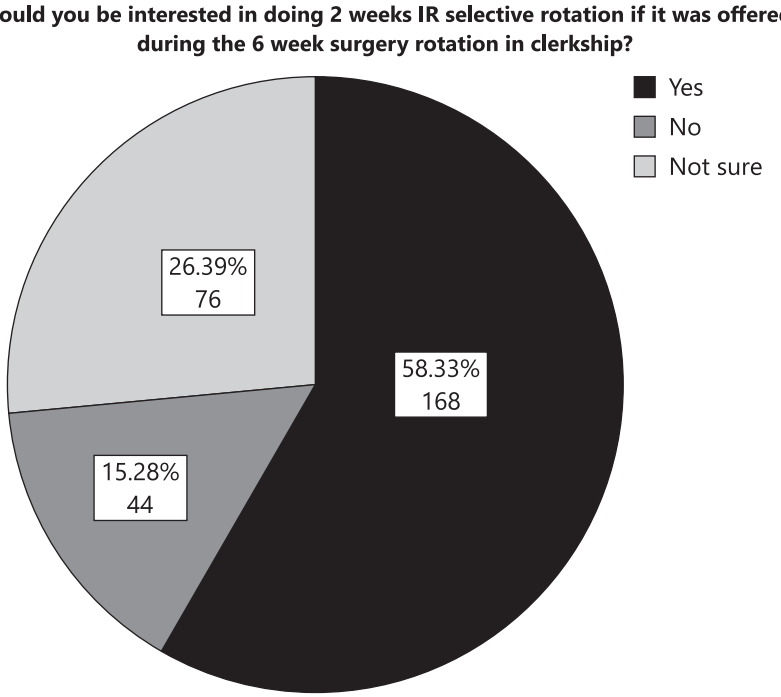

Table 3: Respondents' preference regarding mode of education for IR.

What is preferred system of learning IR?		
Statements	**Frequency**	**Percent (%)**
Radiology elective	20	6.9
Lectures from IR	45	15.6
Problem based learning tutorials	24	8.3
Self directed research	32	11.1
Wards rounds in hospitals	29	10.1
Multidisciplinary meetings	6	2.1
I have had no exposure to IR	132	45.8

ited as all institutions do not have such a setup. Also, it is important to note that career choice has other facets to it, such as clinical exposure to interesting pathologies, inclination towards patient interaction, intellectual challenge, quality of life, knowledge and income[7-9]. There is also a prevalent and perhaps misconceived notion that radiology may be chosen as it is an intellectually and physically less demanding field of medicine. An understanding of the depth and breadth of applications of diagnostic and certainly interventional radiology may refute such assumptions.

There is a need to develop and implement programs of education and exposure for medical students. In doing so it is important to understand that developing a basic understanding of the subject might be a good place to start. Within our study only 34 % could correctly identify one IR procedure, and 66% were unclear regarding the duties of an interventional radiologist as part of a multi-disciplinary team, these figures may help guide us to understand how much needs to be done to educate our future physicians. Although our results show that 66 % of students thought that a two week diagnostic radiology rotation would be sufficient, 58 % thought that a mandatory two week IR rotation should be incorporated during surgical rotations. These figures were 74 % and 71 % respectively for the Canadian study

by O' Maley et al[3]. This data suggests that provided the right atmosphere there is interest in the students to learn more about this sub specialty. Given that IR plays an important part in multiple clinical fields, it is logical that exposure to this division should be improved. In their part, interventional radiologists must play a more active role to involve students, radiology residents and interested scholars in active teaching both hands-on in the angiography units themselves as well as didactic lectures to help spur and maintain interest. IR lectures were rated as the most effective means of learning in our study group. In the study of Ghatan et al, a survey taken before and after an introductory lecture to IR indicated that exposure to IR might increase interest and impact career decisions by augmenting understanding and impression of this specialty division[5].

There are limitations to our study. As our study involved one medical institute, by no means do we believe that this is the complete narrative. Response to the study was voluntary, thus perhaps those less interested did not respond leading to overestimation of what the values really represent. Those that did respond also may give bias in favor of radiology if they were indeed interested in this field. These surveys may need to be expanded to a larger population of students, even radiology residents or current trainees of different specialties. However our responders did give us vital information that helps us understand the gaps in educating and igniting interest in this field that requires multi-disciplinary involvement for its own continuity. Carrying the increasingly dual role as educators and clinicians we need to understand what would be the best methodology for teaching. Going forward., mandatory clerkships, elective rotations, didactic lectures, hand-on simulations, web based teaching segments, complimentary audio-visual aids may be considerations amongst others to generate interest among our medical students.

Conclusion

Medical student exposure regarding interventional radiology (IR) at the undergraduate level is suboptimal. This shortfall needs to be addressed in the undergraduate medical curriculum, not only with the aim to attract future innovators for continued growth of this specialty, but also to increase awareness among future referring physicians. Going forward, curriculum advisors, Interventional radiologists, radiological societies and medical school boards all need to work in unison to help promote this field and provide the proper environment for it to flourish.

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CONTRIBUTORS

IUR conceived the idea, planned the study, and drafted the manuscript. MA, SA and MAR helped acquisition of data and did statistical analysis. DTR and MJ drafted and critically revised the manuscript. All authors contributed significantly to the submitted manuscript.

APPENDIX 1: SURVEY

NOTE:

This survey is being conducted by Shifa Radiology Department to assess the level of knowledge that medical students have regarding interventional radiology. It was created in to assess the level of exposure that medical students have to interventional radiology so that we may assess the need for further education in this field.

The survey is completely anonymous. Participants cannot be identified. By taking the survey you are consenting to let us, the investigators, use the data compiled. You will be asked a series of 16 questions, most of which are multiple choice format or true/false. Thank you for taking the time to fill out this survey!

QUESTINNARE

1. Year of medical school 1 2 3 4 5

2. How would you rate your knowledge of interventional radiology as compared to other subjects?
Excellent/good/adequate/poor/no knowledge

3. Have you completed or do you plan to complete an elective in radiology (diagnostic or interventional)?
Yes
No

4. Would you consider a career in diagnostic radiology?
Ye s
No
Not sure

5. Would you consider a career in interventional radiology?
Ye s
No
Not sure

6. If you answered no or not sure to the previous question, please choose the most appropriate reason why.
I don't find it interesting
I don't know enough about it
The lifestyle is not for me
Radiation exposure
Other (please specify):_____

7. Have you seen patients who were treated by an interventional radiologist?
Ye s
No
Not sure

8. Please list three interventional radiology procedures that you are aware of:
1. _____

2. _____

3. _____

9. An interventional radiologistmustcomplete a residency in:
Radiology surgery
Both radiology and surgery
Internal medicine
Other (please specify):_____

10. Interventional radiologists have outpatient clinics.
Tr ue
False

11. Interventional radiologists do ward rounds in the hospital.
Tr ue

False

12. Interventional radiologists admit patients to the hospital.
Tr ue
False

13. What has provided you with the most information about interventional radiology?
Radiology elective
Lectures from interventional radiologists
Problem-based learning tutorials
Self-directed research
Ward rounds in the hospital
Multidisciplinary meetings
I have had no exposure to interventional radiology.

14. How would you prefer to gain exposure to interventional radiology? Please rank the following methods for learning (rank 1 [best] to 8 [worst]).

Ward rounds_____
Radiology department electives_____
Lectures from interventional radiologists____
Multidisciplinary meetings_____
Self-directed learning websites____
Problem-based learning tutorials_____
Clinical research projects_____

15. Do you think a mandatory 2-week radiology rotation during clerkship would be beneficial?
Ye s
No
Not sure

16. Would you be interested in doing a 2-week interventional radiology selective if it was offered during the 6-week surgery rotation in clerkship?
Ye s
No
Not sure