Assessment of general practitioners' knowledge of clinical applications of nuclear medicine

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ABSTRACT

Background: *The demand for nuclear medicine procedures is growing in recent years but training of medical students in this subject is not appropriately developed. There is no well defined program for training medical students in the field of nuclear medicine.*
Purpose: *To evaluate the knowledge of the general practitioners from clinical applications of nuclear medicine.*
Methods: *One hundred and six general practitioners (58 male and 48 female) participated in an exam with 14 multiple questions (Four question on general nuclear medicine and 10 questions on clinical applications of nuclear medicine). Also their idea was asked regarding training in nuclear medicine. Validity of questions was confirmed by nuclear medicine specialists and consensus of four reference text books(3-5). Minimum score was 0 and maximum score was 14. Correct answering of less than 50% of questions were considered as poor, 50-70% were intermediate and >70% as good.*
Results: *Of all participants, 95% were under 40 years old , 92% graduated in the last 10 years and 52% were trained in Mashad universities. The study showed that 32% of participants have poor results and only 12% of participants had good results. About 62% of participants correctly answered to less than 58% of questions. Overall mean score was 7.53± 2.72. Doctors graduated from Tabriz universities had significantly higher scores than graduates from other universities. Sixty nine percent of participants had no training in nuclear medicine at all and the rest had a variety of 3-15 hours of training. About 90% of participants needed more information in nuclear medicine as they checked in the questionnaire.*
Conclusion*: Our study showed that knowledge of general practitioners in the field of nuclear medicine is poor and they need to improve their knowledge.*
Key words*: KNOWLEDGE, MEDICAL STUDENT, NUCLEAR MEDICINE,*

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Introduction

Nuclear medicine uses radioactive drugs for diagnosis and treatment of patients(1). Although preliminary applications were limited to thyroid scanning and uptake measurements, increasing applications were defined in last decades(2)and nuclear medicine became an important part of patient diagnosis and therapy(3). Imaging in nuclear medicine is a functional image which is significantly different from anatomical images acquired in radiology (4-5). Unfortunately there is not any specific training course in nuclear medicine for medical students in medical faculties in Iran(6). The knowledge of doctors in nuclear medicine may have an impact on diagnosis and therapy of their patients. Also assessment of physicians' knowledge in the field of nuclear medicine is important for educational officials as well as for nuclear medicine lecturers. This study tries to assess general practitioners' knowledge of clinical applications of nuclear medicine.

Methods and Materials

This cross-sectional study was conducted on general practitioners in Mashad in north east of Iran at 2002. A test was developed with fourteen questions, all multiple choice with only one correct answer. The questions were categorized in two groups: 4 questions about general information in nuclear medicine and 10 questions from most common clinical applications of nuclear medicine of different organs. Validity of questions was confirmed by a group of nuclear medicine specialists and consensus of four reference text books of nuclear medicine (3-5). Reliability of the test was confirmed by alpha coefficient of 0.62. (7)

There was one positive point for each correct answer and a zero point for wrong answer. Therefore there was a minimum score of zero and a maximum score of 14. Also four questions were added to assess of general practitioners' opinion on training in nuclear medicine.

Results

One hundred general practitioners (58 male, 42 female) participated in this study. Sixty percent of participants were under 30 years old, 35% in the range of 30-40 years and 5% were older than 40. Seventy percent were graduated in the last 5 years, 22% were graduated 5-10 years ago and 6% were graduated before 10 years ago. Fifty two percent of participants were graduated from Mashad universities (Table 1).

TABLE 1- Number of participants graduated from different universities.

University	Number of participants
Mashad	52
Tehran	16
Tabriz	6
Others*	26

* Others include Shiraz, Birjand, Yazd, Hamedan, Rasht, Kermanshah, Kerman and Rafsanjan universities.

Four questions were about general information of nuclear medicine which only 27% of participants answered correctly to all questions. Also 26% did not answer to any of these questions correctly. From 10 questions in clinical indications of nuclear medicine, mean correct answer for each question was 46.9%.

Considering 14 as the maximum score, scores less than 50% of 14 score (<7) were considered as poor, between 50-75% medium and greater than 75% as good score. The study showed that 32% of participants have poor results (Fig1), on the other hand only 12% of participants had good results. Overall mean score was 7.53+/-2.72 from maximum 14 scores and 62% had scores of equal or less than 8. Also mean scores were 11(+/- 1.78) for graduates from Tabriz University, 9 (+/- 1.09) for Tehran University and 7.87(+/- 2.57) for Mashad University graduates. Mean score was 6 (+/-2.11) for other universities overall. Using independent t-test for comparison, scores of the graduates from Tabriz universities is significantly higher than Tehran universities (p=0.004). The

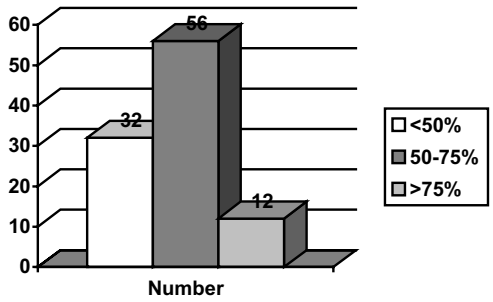

FIGURE 1-

same is true for Tehran universities compared to Mashad university graduates (P=0.01). Also graduates from Mashad Universities get more points compared to Other universities (P=0.001).

Sixty nine percent of participants had no training in nuclear medicine during their undergraduate medical education in medial faculty while 31% had a variety of 3-15 hours of training in nuclear medicine. All training courses were integrated in a clinical or radiology modules and there was no independent course for nuclear medicine. Eighty percent of participants checked that there must be an independent course of nuclear medicine in medical faculties and another 15% think that it may be necessary. Also 90% of participants believe that they need more information in the field of nuclear medicine and 65% prefer educational pamphlets or CME courses.

Discussion

This study showed that 62% of general practitioners have relatively poor knowledge in nuclear medicine (correct answering to less than 58% of questions). This may affect management of patients using new modalities of nuclear medicine. This should be a focus of concern for nuclear medicine lecturers as well as educational authorities.

Teaching nuclear medicine is highly variable in multiple countries. (8-9) In European countries medical students have an average of 17.4 hours teaching in nuclear medicine while outside Europe it is about 16.1 hours.(8) In some universities like in France, Denmark, Taiwan , Poland and Turkey teaching nuclear medicine is a compulsory independent course while in others it is an optional course integrated in another program(like radiology, endocrinology, etc.)(8). However most

of the universities offer an optional course of nuclear medicine which may be different from 10 hours to few weeks. Our study showed that in some universities in Iran, there is no training at all. In others medical students have a few hours of nuclear medicine training during the course of radiology. In fact these programs are dependent on the interest of scientific staff and are not a well defined program. Anyhow about 90% of general practitioners feel that they need more information in nuclear medicine.

The difference is scores of graduates from different universities in our study, may reflect the different approach of training in these universities. The length of training course as well as the presence of nuclear medicine facilities in these universities may play a role too.

Nuclear medicine in a rapidly growing science and it is expected that doctors who graduated in the last decades have poor information in the field of nuclear medicine. As 70% of our studied group graduated in the last 5 years and 92% in the last 10 years, this study suggest that even knowledge of young doctors are poor in nuclear medicine.

Our study showed that knowledge of general practitioners is poor in the field of nuclear medicine and they need to increase their knowledge preferably using educational pamphlets and CME courses.

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