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Small Group Teaching Method for Radiology Post-graduate Students in Radiodiagnosis

G. Balachandran*

Department of Radiodiagnosis, Rajah Muthiah Medical College & Hospital, Annamalai University, Chidambaram, India

**Corresponding author*

Abstract

To Implement and monitor a formal small group training program for first year radiology post-graduate. Initially six radiology modules were chosen for this pilot study. Ten radiology post graduate students were taught those radiology topics. Each student had to write a pre--test evaluation exercise. Later they were given a lecture on the chosen topic. After the lecture students were asked to write a post--test evaluation exercise. At the end of all radiology modules, they were asked to give feed back on this method of teaching. Students felt that this method of teaching was very useful and helped them gain better skill.

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Keywords

Radiology postgraduate students; Teaching methods; Small group study

Introduction

Teaching radiology to Post graduate is an enormous task. Further it has to be completed within a span of 2-3 academic years. Radiology subject alone is as vast as entire medical curriculum. Radiology is a broad speciality of all sub-specialties like neurology, neurosurgery, cardiology, urology to name a few. In any given radiology department, particularly in India, the time allotted to radiology teaching is hardly 1-2 hours per day. For most of the time the student is engaged in doing routine radiology procedure (under the guidance of seniors) or reporting images (USG, CT, MRI etc.). The student hardly has any time to attend classes, leave alone learning from images. In such situations students should be taught radiology as per the available meagre time. It is best to start with emergency radiology (ER), for this is what a student is facing in his daily radiology practice. The teaching method has to be modified to improve student's skill and teach him the essential basic in ER.

Emergency Radiology is an evolving subspecialty of the vast general radiology curriculum. The Radiology curriculum has recognised the importance of formal training in this area with the introduction of "Key conditions in Year 1 training" of radiology post-graduates (RPG) (1).

Materials and Methods

Small group of radiology post-graduate students (n=10) were included in the study. These ten students were first year radiology residents. They were given prior instructions of how the study is being planned. Six radiology modules in emergency radiology was created for the initial pilot study.

Since most of the members of the group were new students to radiology, a topic in basic radiological anatomy was also included. Table 1 shows the details of various modules.

Methods

Initially student was asked identify 10 images from emergency curriculum, in each module, as pre-test questionnaire. Later they were given conventional PPT lecture, covering selected subjects in each module, for 30-40 minutes. The topics chosen were, from emergency radiology syllabus, small enough to teach the basic essential features for the students. This amount of teaching was easy to grasp by the students.

Later students were asked to answer the same images as Post test questionnaire. The number and type of images were the same in both pre and post test questionnaire. This is to identify how much better the students performed after the lecture.

After the initial study modules were completed the students were asked to complete a feed-back survey about the usefulness of small group study. The total time taken was 60 minute for each module. Each module had a normal image appearance followed by images from emergency images from respective modules. Each student performed the following task (Table 2) in this pilot study.

Observation

The students enthusiastically participated. Overall performance of students is shown in Table 3, The accuracy percentage is shown in graph 1. Overall percentage improvement is shown in Table 4 and graph-2. While the sample size from this preliminary study is relatively small, initial results have yielded improvements in reporting speed and accuracy of up to 60.0% and 80% respectively. The overall trend shows an average improvement in speed and accuracy of 16 % and 25% respectively Every participant improved in both the

number of cases reported (speed) and the number of cases correct (accuracy), In addition, with increasing improvement in accuracy there is an apparent decrease in improvement in speed. This is not a statistically significant result owing to the small sample size, however the trend is somewhat unexpected. While each PG improved in both speed and accuracy, it was expected that as the accuracy improved so would the speed, as the participant would spend less time on cases they got right. There is no clear association between the initial examination results and any subsequent improvement, although associations such as these may be elucidated in the future when a greater sample size achieved.

Results and Discussions

Aside from the small sample size, the main study limitation is the absence of a control group. That is, was the improvement seen in the post-course examination due to the quality of the Key Conditions course, or was it due to other factors such as day-to-day experience and progress acquired on-the-job during the early week period? We acknowledge this limitation, however excluding half of all new PG’s from the key conditions training was felt to be inappropriate given the potential benefits. Given the relatively low exposure to Emergency Radiology over this early week period outside the Key conditions training, it is likely that the improvement in speed and accuracy can be ascribed to the training. In the future we will consider possibilities where a control group can be tested. An example of this may include initial delay of Key Conditions training until the trial group have finished the course. We plan to continue the Key Conditions training course for each new intake of PG’s and accumulate data regarding its effectiveness for improving post-course abilities.

Table.1 Emergency radiology modules

MODULE	BODY / REGION	MODALITY	TOPIC
1	BRAIN	CT SCAN	NORMAL CT ANATOMY
2	BRAIN	CT SCAN	CT SCAN HEAD INJURIES
3	THORAX	X-RAY	NORMAL THORACIC ANATOMY
4	THORAX	X-RAY	COMMON EMERGENCIES IN CXR
5	BRAIN	CT SCAN	NORMAL BRAIN BLOOD SUPPLY
6	BRAIN	CT SCAN	CT SCAN IN STROKE
7	ABDOMEN	X-RAY	NORMAL ABDOMINAL ANATOMY
8	ABDOMEN	X-RAY	COMMON EMERGENCIES IN AXR

Table.2 Task for each participant

TASK	NUMBER
1.Answer pre-test questionnaire in each module	80
2.Listen to PPT presentation	8 Modules
3.Answer post -test questionnaire in each module	80
4.Answer the feed back survey forms	1 each

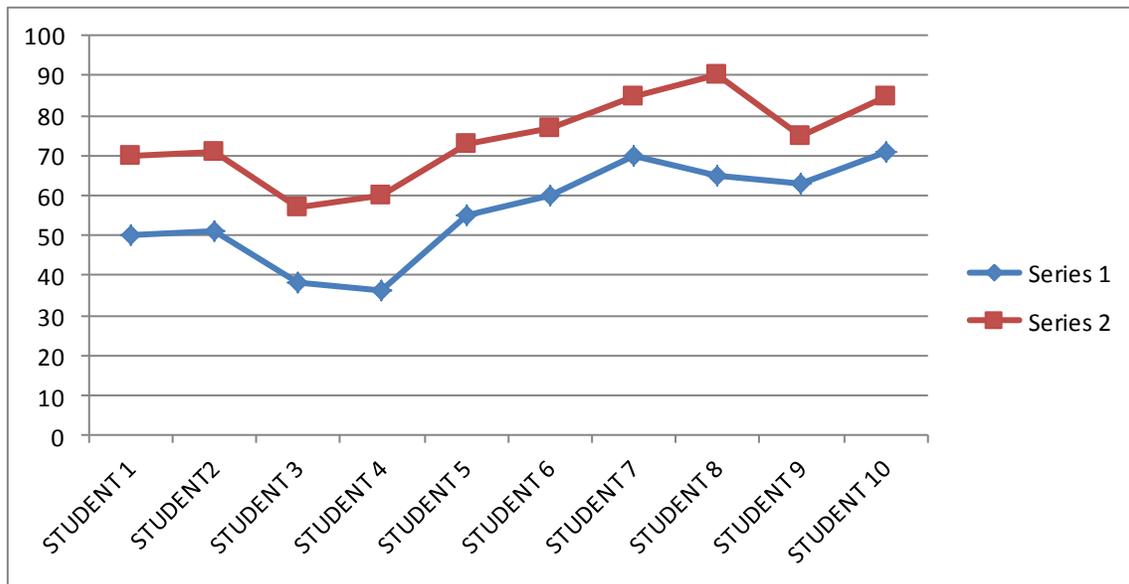
Table.3 Overall performance

PG	PRE-TEST (80)	POST-TEST (80)	IMPROVEMENT	TOTAL (160)
1	50	70	20	120
2	51	71	20	122
3	38	57	19	95
4	36	60	24	96
5	55	73	18	128
6	60	77	17	137
7	70	85	15	135
8	65	90	25	155
9	63	75	12	138
10	71	85	14	156

Table.4 Overall % improvement

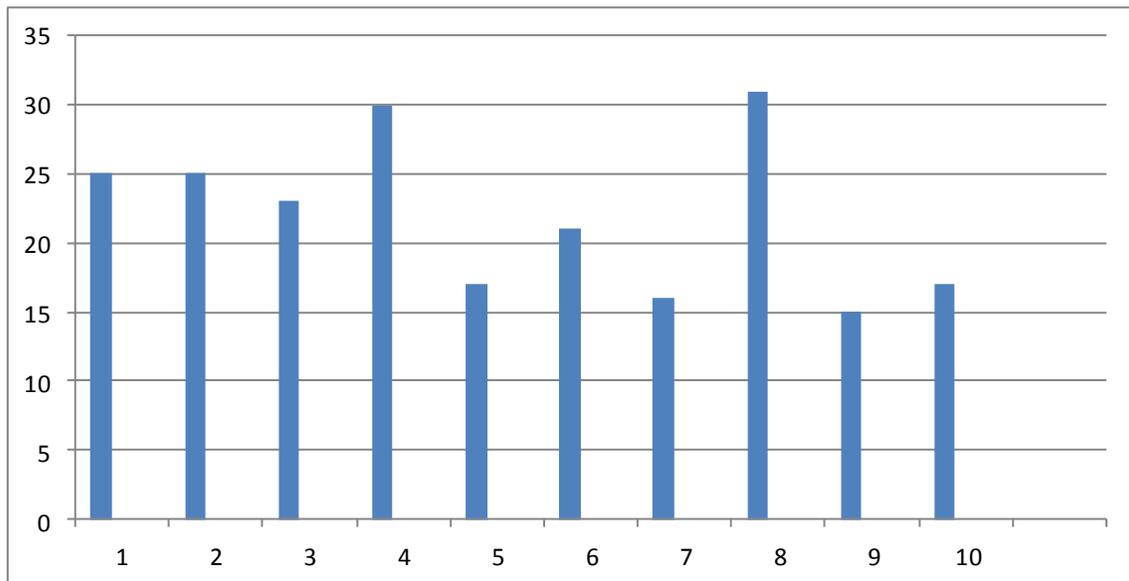
PG	%
1	25
2	25
3	23
4	30
5	17
6	21
7	16
8	31
9	15
10	17

Graph.1 Accuracy percentage



Blue- pre-test series
Red-post test series.

Graph.2 Overall Percentage improvement



In conclusion, early results demonstrate advances in accuracy and speed of Emergency Radiology reports issued by junior registrars, and suggest significant ongoing educational and departmental benefit. Ongoing Key Conditions training and assessment for all new registrars is planned.

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