

# Role of case studies in mammography training of radiology residents.

Annapurna Srirambhatla<sup>1</sup>, Prashanth Kumar K.S<sup>2</sup>,

<sup>1,2</sup>Assistant Professor Department of Radiology,  
Kamineni Academy of Medical Sciences and Research Center, LB Nagar, Hyderabad

[ Received: 29/08//2015, Revised: 14/09/2015, Accepted:07/10/2015]

## Abstract:

**Introduction:** Mammography is the primary screening tool for breast cancer. Findings on mammogram are assigned a score based on BIRADS system which is a standardized internationally followed system. BIRADS system helps in risk assessment and charts the further course of action.

**Aim:** Assess the ability of students to analyze mammography reports and select an appropriate follow up for the patient.

Assess the ability of the student to analyze the pre mammography questionnaires and select patients who need genetic counseling.

**Methodology:** The first and second year radiology residents participated in our study. The students were assessed regarding their knowledge on questionnaires on mammography screening protocols adjusted to risk, genetic associations of breast cancer, assigning appropriate BIRADS score to the mammography lesions detected and selecting the patients to be biopsied following textbook reading and an interactive case based teaching. The results of both the tests were evaluated to assess the efficacy of case study as a method of teaching.

**Results:** The mean score of the students in the test following textbook reading was 5/10 in the mammography screening protocol assessment and 7.2 in BIRADS scoring and prognostication. Following case study based teaching, the scores improved to 8/12 and 9/12 respectively.

**Conclusion:** Knowing the implications of mammography reports and identifying patients who require genetic counseling is a step towards integration of diagnosis with clinical outcome which helps the students approach patients problems in a holistic manner.

**Key words:** BIRADS, case studies, integration, holistic, mammography

## Introduction:

Breast cancer is the most common malignancy to affect the urban women population and the second leading cancer in rural India<sup>(1)</sup>. Mammography is the primary screening modality for breast cancer and has been shown to reduce breast cancer mortality by 30-40%.

Mammography reports are assigned a score of BIRADS which is an internationally followed scoring system. BIRADS scoring helps in lesion characterization, risk assessment and charts the further clinical course to be followed.

Hence a radiologist plays a key role in breast cancer screening and has to be aware of the internationally followed cancer screening protocols to be able to counsel the patient. He/she should be well versed in the implications of BIRADS scoring to be able to give appropriate advice to the clinician with regards to the further management.

Teaching the above points to the radiology residents

involves the cognitive and affective domains of learning. Case based learning was used in our study as it is known to facilitate higher levels of learning which include analysis, evaluation and application<sup>(2)</sup>. Also case based learning help in facilitation of inter disciplinary learning and help integrate specific academic learning with real life / societal issues<sup>(3,4,5)</sup>

## Methodology:

All the radiology residents of our hospital, total of 7 were included in our study. Initially the students were assessed regarding their knowledge on questionnaires on mammography screening protocols adjusted to risk, genetic associations of breast cancer, assigning appropriate BIRADS score to the mammography lesions detected and selecting the patients to be biopsied following textbook reading (TBR).

An interactive lecture was then taken covering all the above points using case studies. A post test was conducted (CS). The results of both the tests were

## Correspondence:

**Dr. Annapurna Srirambhatla**

Assistant Professor Department of Radiology,  
Kamineni Academy of Medical Sciences and Research  
Center, LB Nagar, Hyderabad, Phone:9676888781  
Email: purnasrirambhatla@gmail.com

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evaluated to assess the efficacy of case study as a method of teaching

### Results:

A total of seven radiology residents participated in our study. There were two female residents in our study. The mean score of students in the pre mammography counseling section was 5.2 for TBR and 8 for CS. In the BIRADS section, the mean score of students was 7.2 and 9 for TBR and CS respectively (TABLE 1).

The number of students who showed an increase in scores by 30% was five for pre mammography counseling and two for BIRADS scoring. The female residents did better than the male residents with higher pretest scores of 7, 9 and 7, 10 in both the sections (CHART 1).

Number of students showing an increase in marks by 30%:-

Pre mammography counseling: 5

BIRADS scoring: 2

Percentage increase in mean scores in the two segments:-

Pre mammography counseling: 28%

Mammography BIRADS: 15%

### Discussion:

The ultimate goal of medical education is to produce students with adequate skills and knowledge to treat common health problems thus contributing to patient health and care. The student must also show affective communication skills to interact with the patients and colleagues.

Patil<sup>(6)</sup> summarizes the features of postgraduate training today as including

- a progressive syllabus that has both formal and informal elements
- a recognized trainer and training unit
- proactive supervision
- a balance of clinical duties and educational activities
- protected time for education and
- Defined exit outcomes.

Teaching through case studies has been one of the widely used teaching strategies for clinical subjects. Case studies “bridge the gap between theory and practice and between the academy and the workplace”<sup>(7)</sup>. In our study this teaching strategy was used for teaching the students the importance of pre mammography questionnaires and application of BI-RADS scoring for patient counseling and further management. Thus both the cognitive and affective domains of learning were put to use.

It was found that an increase in percentage of marks by thirty percent was noted in four out of seven students

in the pre mammographic counseling segment. In the BI RADS scoring segment, only two students showed an increase in marks percentage by 30%. The reason for latter can be good pretest scores of majority of students in the BI RADS segment. BI RADS scoring and risk assessment being a predominantly image interpretation and risk assessment category, the students had good baseline knowledge. Pre mammography counseling needed a strong knowledge of genetic associations and screening protocols using the affective domain, not commonly covered in mainstream teaching and so had low TBR scores.

In his article, case study teaching method improves student performance and perceptions of learning gains, Kevin .M. Bonney<sup>(8)</sup> has found that case study teaching method promotes learning and improved student performance on examination questions compared to textbook reading. He reported an improvement of student examination scores by an average of 18%. Also case study teaching was demonstrated to significantly increase student perceptions of overall learning gains compared with class discussions and textbook reading. Sumana Panja et al<sup>(9)</sup> observed that clinical case based modules not only served to enhance students skill in tackling case based items, but also developed their critical thinking and higher ordered learning such that they became more adept at solving non case based items. Case based teaching being more close to real life situations arouses the students interest, exposes them to practical problems and helps analytical thinking. The disadvantages of case based teaching are that it involves more effort on the part of the teacher and case studies selected should effectively bring out the point to be taught.

### Conclusion:

The impetus of teaching in the subject of radio diagnosis has always been on making the correct diagnosis and / or in giving the closest differentials. Knowing the implications of mammography reports and identifying patients who require genetic counseling is a step towards integration of diagnosis with clinical outcome which helps the students approach patient's problems in a holistic manner.

Teaching through case studies was found to be an effective way to integrate knowledge learnt through lectures and clinics with practical real life experiences under controlled environment

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How to Cite this article :

Srirambhatla A, K.S. Prashanth Kumar , Role of case studies in mammography training of radiology residents.

*J Educational Res & Med Teach* 2015;3(2):17-9

Funding: Declared none Conflict of interest: Declared none