

## Students' perspective of their postings in cardiology during early clinical exposure

Vaishnavi Devi<sup>1</sup>, Nawin Suriya<sup>2</sup>, R. Shanmuga Sundaram<sup>3</sup>, G. Sumitra<sup>4</sup>, PA Kumar<sup>5,\*</sup>

<sup>1,2</sup>UG Student, <sup>3</sup>Professor, Dept. of Cardiology, <sup>4</sup>Associate Professor, Dept. of Biochemistry, <sup>5</sup>Professor, Dept. of Anatomy & Centre for Clinical Simulation & Research, PSG IMSR, Coimbatore

**\*Corresponding Author:**

Email: drpakumar@yahoo.com

### Abstract

**Introduction:** Information regarding conduct and evaluation of Early Clinical Exposure (ECE) which has been mandated by Medical Council of India, is scarce and the present study is an attempt to highlight the significance of this very innovative program. Regulatory authorities have left the designing and the mode of implementation of the ECE program to the discretion of individual colleges to decide.

**Materials and Method:** As a part of the program of ECE, 150 first year MBBS students were posted in cardiac catheterization laboratory of PSG Hospitals for part of the day. Students in small batches of 10 each had the opportunity of visualizing the activities in this department and could witness the procedure of angiography, which enhanced their knowledge of basic sciences of cardiac anatomy, coronary vasculature and its clinical significance. They also interacted with some of the patients and their attendants.

**Result:** The evaluation of the program through a survey, in the form of a questionnaire (pre-post intervention) revealed that ECE had a positive impact on the appreciation of the relevance of basic sciences they learn during the preclinical years with clinical medicine. The open-ended comments from the participants revealed that the participants rated the program very high and considered it a memorable experience. Interaction with the interventional cardiologists and the patients and their attenders provided them an insight into the uniqueness of medical profession, in general and interventional cardiology in particular.

**Conclusion:** ECE, if properly designed provides avenues of enhancing students' learning in cognitive, psychomotor and affective domain.

**Keyword:** Early clinical exposure, Cardiac Catheterization Lab, Cardiology

**Received:** 1<sup>st</sup> March, 2017

**Accepted:** 12<sup>th</sup> June, 2017

### Introduction

In India, undergraduate medical degree of MBBS spans for a period of four and half years, which is followed by one year of compulsory rotating residential internship (CRRI). Students enter medical college soon after they complete their secondary school education and commence learning basic sciences of Anatomy, Physiology and Biochemistry. During this period, they do not have instructions in the hospital, since Clinical sciences are introduced only in the second year of their study.<sup>(1)</sup> Educationists have felt that the medical students need to acquire knowledge and skills in a clinically relevant set up and ideally, this process needs to start right from the beginning of the medical career.<sup>(2)</sup> In the conventional way of medical education, there seems to be a 'disconnect' between what the students learn during the first year of their study and what is expected of them from this learning. They need to know the relevance of what is being learnt during the preclinical year of their medical career. What is ideally required then is a system where during the first year students get to realize the clinical relevance of the enormous amount of facts of basic sciences while they are studying these subjects. This can be achieved only by introducing the students to clinical situations in the first year of their medical career itself. Such a program needs to encourage active learning and acquisition of

skills in the correct context, even in preclinical setting and aid in reducing the 'shock of practice' that some students encounter when they enter clinical studies and later on, during internship.<sup>(3)</sup> It is also pertinent to inculcate the correct methods of interacting with the patients in the minds of the young students, which helps them to familiarize themselves with the hospital settings- attributes which come under the affective domain (attitude) of learning.<sup>(4)</sup> Following the recommendations of World Federation of Medical Education (WFME),<sup>(2)</sup> agencies like Health Profession Council for South Africa<sup>(3)</sup> and other worldwide medical education agencies acknowledged the necessity for promoting clinical exposure for the medical students early in their career, thereby emphasizing the necessity to integrate knowledge of basic sciences with clinical learning.

Taking into consideration, the significance of introducing clinical relevance of subjects learnt during the first year MBBS course, Medical Council of India (MCI), has advocated a restructured curriculum in its newly proposed syllabus from 2015, wherein a program of 'Early Clinical Exposure (ECE)' has been introduced.<sup>(5)</sup> ECE ensures the students 'to understand the relevance of basic sciences in the clinical context' as a mandatory component of the first year of undergraduate medical training.<sup>(5)</sup> Even though many

medical colleges are eager to satisfy this MCI mandate, they find many hurdles on the way. Lack of time required for this new program within the already fully packed first year MBBS academic schedule and the reluctance of the faculty to try out new ventures at the cost of conventional methods seem to be the major issues faced by the faculty and the management. In a few instances, lack of proper 'dialogue' between the medical college and the teaching hospital may also result in lack of co-ordination rendering this mission a failure. PSG Institute of Medical Sciences and Research (PSGIMSR) in Coimbatore; Tamil Nadu in India, however, has established such a program and has been conducting it successfully for a few years. This paper is an attempt to evaluate the students' perspective of their rotation in the Cardiac catheterization laboratory during the ECE program.

### Materials and Method

One hundred and fifty first year MBBS students of PSG IMSR were involved in this study. They were divided into 15 batches, each batch containing a group of ten members and ECE was held during the afternoons on the designated days. ECE was held in two rotations: during the first rotation, students were required to visit departments of Radiology, Surgery, General Medicine (Internal medicine), Transfusion medicine and Clinical Simulation Laboratory. In the second turn, they were posted in the departments of Cardiology, Nephrology, Respiratory Medicine, Oncology and Clinical Simulation Laboratory. During these visits, in addition to observing the routine in these departments, they also had the opportunity of interacting with the clinicians available at that time.

The students who visited the cardiac catheterization laboratory, during the rotations of ECE had the opportunity to visualize the activities in this laboratory, observe the functioning of some of the equipment's and most importantly, they also observe the procedure of performing angiography, which enhanced their knowledge of basic sciences of coronary vasculature and its clinical anatomy. They had the opportunity of interacting with the patients and their attendants, as well. The program was evaluated through a survey, which was in the form of a questionnaire (pre-post intervention) of ten questions related to cardiology. The feedback questionnaire also had a section which invited open-ended comments from the participants. The answers were rated on a Likert scale of five with options of 'strongly disagree', 'disagree', 'undecided', 'agree', and 'strongly agree'.

The participating students were asked to respond to the questionnaire without revealing their names, thereby ensuring confidentiality. Data, extracted from the questionnaire was analyzed using IBM SPSS (Statistical Package for Social Sciences) software, Version 19. One sample Kolmogorov-Smirnov test was used to determine the normality of the variables. Since

the variables were found not to follow a normal distribution and hence non-parametric tests were used. The total scores before and after the intervention of ECE were compared using the Wilcoxon signed rank test.

### Results

The mean score of the participants in the pretest was 19 out of a total score of 40. All the participating students showed an improvement in the range of 10 to 15 marks in their post test score. The median post test score was 34 marks and on an average they scored high by 14 marks. The difference in the scores was found to be statistically significant with a p value < 0.001. Feedback from the students showed that this strategy was useful to learn cardiac anatomy and physiology with special emphasis on coronary circulation.

Following are some of the comments from the students: "Was great, Very interesting & useful". "Learned the etiology of ischemic heart disease and also arterial valve stenosis"; "Saw trans-radial procedure. It looked simple but we understood how intricate the procedure was"; "After this module of ECE only, we knew that patient was only under an IV sedation while we were watching his coronary circulation! "invasive cardiology is innovative & interesting". "Feeling blessed to see a live angiograph procedure".

### Discussion

Even though quite a few medical colleges seem to have been involved in implementing ECE in right earnest as per the guidelines of MCI, reports concerning implementation of this program are scanty.

In order to become a success, a program needs to reach the target group and reflect the desired effect of the intervention. The present study is unique in this respect, since it reflects the perspectives of the students who had the opportunity of going through this structured course of ECE in this thirty-year-old medical college. The views expressed by the students will significantly contribute to the evaluation of this program and are likely to influence the implementation of the program in the coming years.

During their posting (rotation) in the cardiac catheterization laboratory, the students were able to visualize the blood supply to the heart in a patient undergoing angiography. This is a scenario far different from the learning experience from cadaveric dissection. This episode, by itself, has greatly enhanced to bridge the 'disconnect' between details of basic sciences and clinical situation. This is amply reflected in the comment: 'Roots of coronary arteries were clearly seen and we understood the possible complications due to a block in the coronary artery and arterial valve stenosis'. Such positive and greatly appreciative comments are in line with similar findings expressed by students in UK.<sup>(3)</sup>

Witnessing the procedure of cardiac catheterization, either trans-femoral or trans-radial route has been an exciting experience for these students since they could appreciate the clinical anatomy of these regions in an explicit manner. Students had specifically appreciated visualizing the coronary vessels, while the patient was sedated by an intravenous injection. The procedure has given them an opportunity to observe coronary circulation as it happens in a patient and to understand events during cardiac cycle. For a novice to the medical profession, this has been a great experience. In short, this has impressed upon them the essential anatomy and physiology of the heart and great vessels in an integrated manner and the significance of understanding basic sciences to practice medicine.

The posting in catheterization laboratory seems to have educated them on the possibilities of doing highly exciting tasks which an interventional cardiologist performs routinely. At the same time, this posting has given them an opportunity to realize great amount of responsibility of the practicing physician as well. It is worthwhile to recollect that but for this program of ECE, students would not have had a chance to observe the procedure of angiography since a posting in cardiology is not compulsory during their undergraduate training. It is significant that the medical students need to learn the underlying importance of basic sciences early in their career.

Finally, many of the students were permitted to interact with the patients and/ or their accompanying relatives to share their experience. This has been an enriching experience for the first year medical students. They got the first hand narration of the symptoms the patient had, circumstances that led them to get hospitalized and get the treatment. Their reactions to the experience is summarized by comment from one of the students- "Saw live angiography being performed- I have a very close family member who suffered an acute myocardial infarction and so I am personally and emotionally attached to this particular department. To me, interventional Cardiologists are real life heroes!" Furthermore, the present study has made the students to realize the role of the physicians in alleviating the sufferings of the patients- a task the young students need to be prepared for in their journey of becoming a doctor.

It is generally accepted that inculcating the correct attitude is the most difficult task in teaching. A well-structured program of ECE seems to contribute immensely towards this task. It should be possible to evaluate the students on the affective domain by improvising properly structured questionnaire and personal interviews.

The positive outcomes of ECE were remarkable. All medical students who saw the procedure found it 'interesting and exciting'. Some felt 'blessed to see live angiography procedure'. Certain students got inspired by the way the doctors worked together along with the

cardio technicians and nursing staff and others as a perfect team. They also got an opportunity to see the modern equipment's used in the catheterization laboratory. This module has created awareness in learning process to make them more interactive with patients and to build the habit of self-directed learning.<sup>(6,7)</sup>

Obviously, successful running of an ECE program requires meticulous planning and support from the clinical faculty and hospital management. It is also dependent upon availability of the patients for clinical demonstration and clinical procedures. Students learn to behave properly within the hospital premises and to respect the sentiments of the patients, while they are still in the preclinical year of their career. Experiences from this program suggests that a well-organized ECE program contributes to the overall development of the demeanor of the preclinical students and to make proper use of their preclinical training which forms the basis for their further progress to become efficient physicians.

### Acknowledgements

This program could be conducted only with the cooperation of the clinicians who were involved in this program. Generous time they spent in this project is acknowledged. We thank Dr. Sudha Ramalingam, Registrar- Research at PSGIMSR for her help in designing the study protocol and Ms. Dhivya Kumari, Research Fellow, PSGIMSR for the help in analyzing the data.

### References

1. Tayade MC, Bhimani N, Kulkarni BN, Dandekar KN, et al. "The impact of early clinical exposure on first year MBBS students" *International J. of healthcare and biomedical research*. July 2014;2(4):176-181.
2. Dorman T, Bundy C: "what can experience add to early Medical education? Consensus survey" *British Medical Journal*, 2004; 329: 834-837.
3. Michael McLean 2004. "Sometimes we do get it right' early clinical contact is a rewarding experience." *Education health* 17:1 March: 42-52.
4. Wenrich MD, Jackson MB, Wolfhagen I, et al. "What are the benefits of early patient contact? -A comparison of three preclinical patient contact settings. *BMC Medical Education*" June 2013;13(80):1472-6920.
5. Kachur EK. "Observation during early clinical exposure – an effective instruction tool or a bore". *Med education* 2003;37:88-89.
6. Khalil MK, Nelson LD, Kibble JD. "The use of self-learning modules to facilitate learning of basic science concepts in an integrated medical science curriculum". *Anatomical Sciences Education*. 2010 Sept-Oct;3(5) 219:26.
7. Johnson AK, Scott CS. "Relationship between early clinical exposure and first year students' attitude toward medical education". *Academic Medicine*. 1998Apr;73(4):430-2.