

EFFECT OF EARLY CLINICAL EXPOSURE (ECE) FOR TEACHING BIOCHEMISTRY TO PHASE I MEDICAL STUDENTS :A SHORT TERM STUDY

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Abstract

Introduction: The traditional medical education system prevalent in the Indian Medical Curriculum for the past decade has been based on the model of teaching that confines Phase I medical students into classroom and laboratory setting for their curriculum with an exposure to clinical subjects only in their second year.

Methodology

STUDY TYPE: Educational research

- Study Design: Prospective, interventional
- Sampling Method: Convenient sampling
- Location: Department of Biochemistry, L.T. M. Medical College, Mumbai.

Results: Done using primer of Biostatistics version 7. The comparison for performance of students is done using paired t test. The p value <0.05 is considered to be statistically significant

Conclusion: In a predominantly lecture driven curriculum, it is important to provide opportunities for a shift from “Pedagogy to Andragogy”-ECE can be considered as an effective method of teaching as depicted in the study wherein the scores of students exposed to ECE were statistically significantly higher ($p<0.001$) as compared to those exposed to the traditional method($p<0.05$).

Keywords: 1 MBBS, Students, Medical curriculum

Introduction

The traditional medical education system prevalent in the Indian Medical Curriculum for the past decade has been based on the model of teaching that confines Phase I medical students into classroom and laboratory setting for their curriculum with an exposure to clinical subjects only in their second year. This has resulted in medical students having lesser interest in the subject of Biochemistry. They find it difficult to understand the importance of Biochemistry and the purpose of learning that takes place. They do not acquire the skill of diagnostic interpretation as they are not exposed to patients and their disease states. The T-L methods used till now mainly didactic lectures imparted passive knowledge. Practical experience is a pre-requisite for developing medical expertise. In MCI vision 2015 document Early Clinical Exposure (ECE), one of the new T-L method was one of the reforms which was introduced to improve quality of medical education. Exposure of the students to this new T-L method in the preclinical phase of their learning was to integrate the knowledge of basic science with clinical medicine. This would also help them in acquiring diagnostic and

interpretation skills which would help them in providing a clinical context and relevance to basic science learning. ECE would help in developing logical clinical reasoning skills with improved correlation of diagnostics.

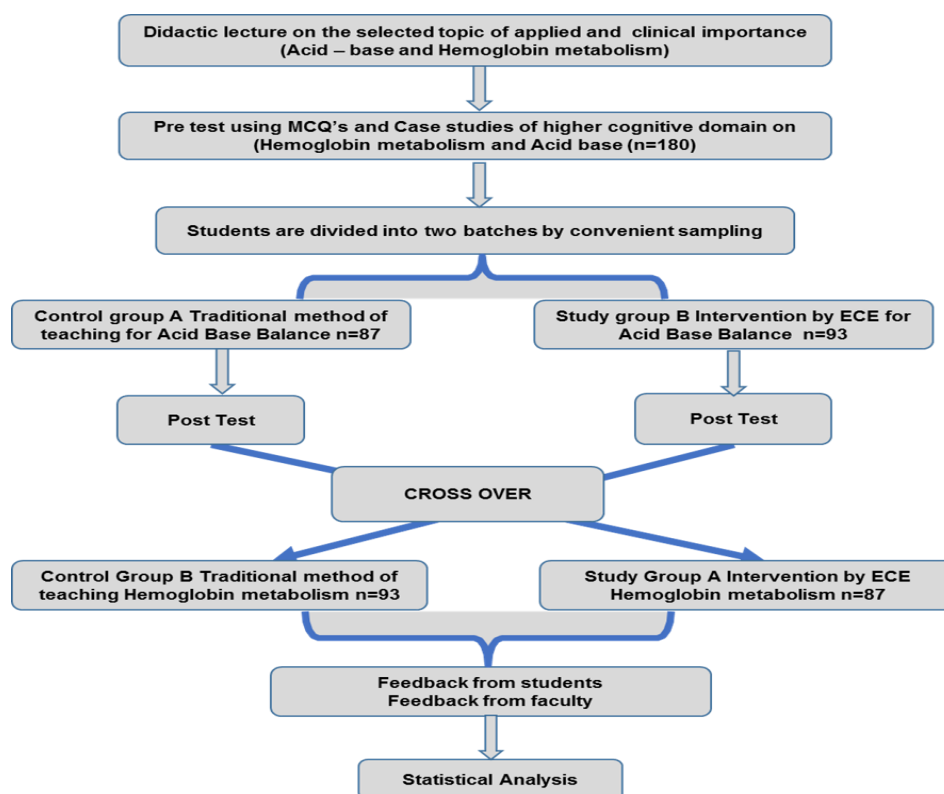
Objectives

- 1) To measure the effectiveness of ECE on Phase I medical students knowledge in Biochemistry and skill in interpreting laboratory reports.
 - 2) To assess the perception of faculty and students regarding ECE.
- To implement ECE as a regular T-L method for teaching Phase I MBBS students

Methodology

STUDY TYPE: Educational research

- Study Design: Prospective, interventional
- Sampling Method: Convenient sampling
- Location: Department of Biochemistry, L.T. M. Medical College, Mumbai.
- IEC: Cleared
- Sample size: 180 Phase I students
- Inclusion criteria: 2019 batch students (written consent)
- Exclusion criteria: Students absent on that day



Results

STATISTICAL ANALYSIS :

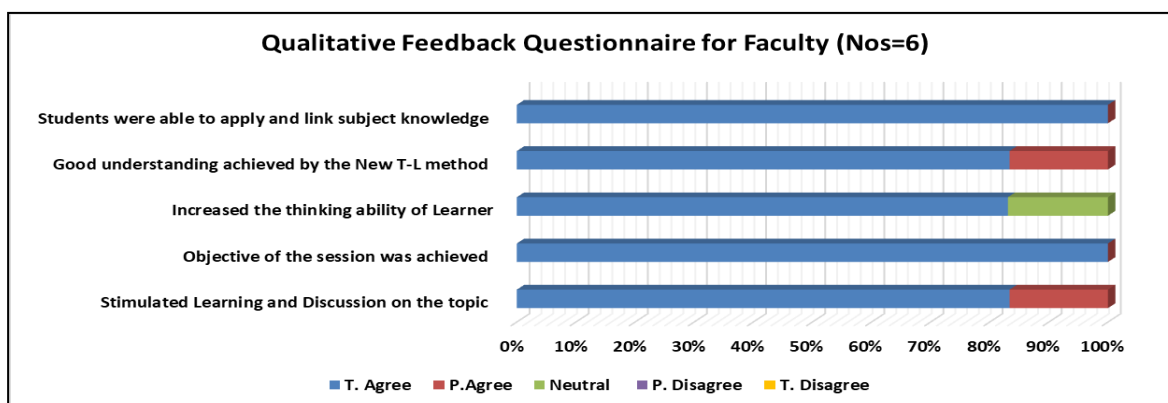
Done using primer of Biostatistics version 7. The comparison for performance of students is done using paired t test. The p value <0.05 is considered to be statistically significant

Table 1: Comparison of Difference of Scores of MCQ and Case Study of Acid Base Balance in Pre test and Post test of Control and Study Group

Name of Applied Clinically important topic	Assessment Technique to test knowledge and Acquisition of Skill & Interpretation	Control Group (Traditional Method)		Study Group (Early Clinical Exposure)	
		Pre Test	Post Test	Pre test	Post Test
		n=87	n=87	n=93	n=93
Mean ± SD					
Acid-Base Balance	MCQ				9.46 ± 0.50
	(out of 10)	4.14 ± 0.41	6.53 ± 0.50 p<0.05	4.14 ± 0.41	p<0.001
	Case Study (out of 5)	2.46 ± 0.18	3.39 ± 0.42 p<0.05	2.46 ± 0.18	4.47 ± 0.28 p<0.001

Table 2: Comparison of Difference of Scores of MCQ and Case Study of Hemoglobin Metabolism in Pre test and Post test of Control and Study Group

Name of Applied Clinically important topic	Assessment Technique to test knowledge and Acquisition of Skill & Interpretation	Control Group (Traditional Method)		Study Group (Early Clinical Exposure)	
		Pre Test n=93	Post Test n=93	Pre test n=87	Post Test n=87
Mean ± SD					
Hemoglobin Metabolism (Thalassemia and Sickle Cell Disease)	MCQ (out of 10)	3.81± SD 0.71	5.78 ± 0.58 p<0.05	3.81 ± 0.71	8.87 ± 0.51 p<0.001
	Case Study (out of 5)	2.67 ± 0.27	3.39 ± 0.42 p<0.05	2.67 ± 0.27	4.59 ± 0.19 p<0.001



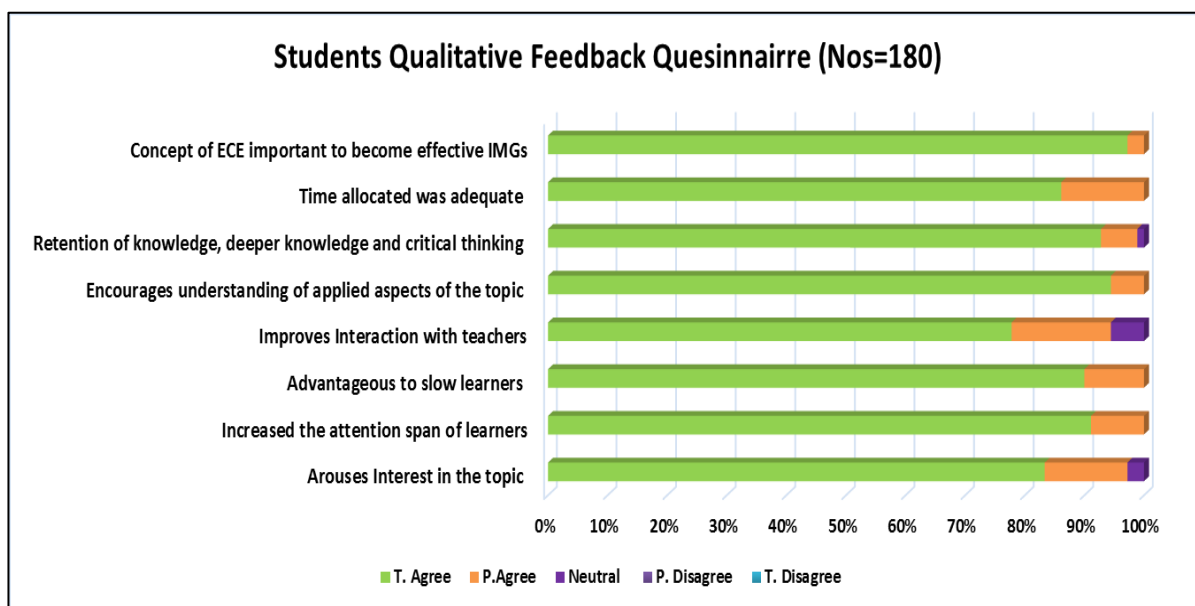


Fig 1 : Comparison of Difference of Scores of MCQ and Case Study of Acid-Base Balance in Pretest and Post test of Control and Study Group

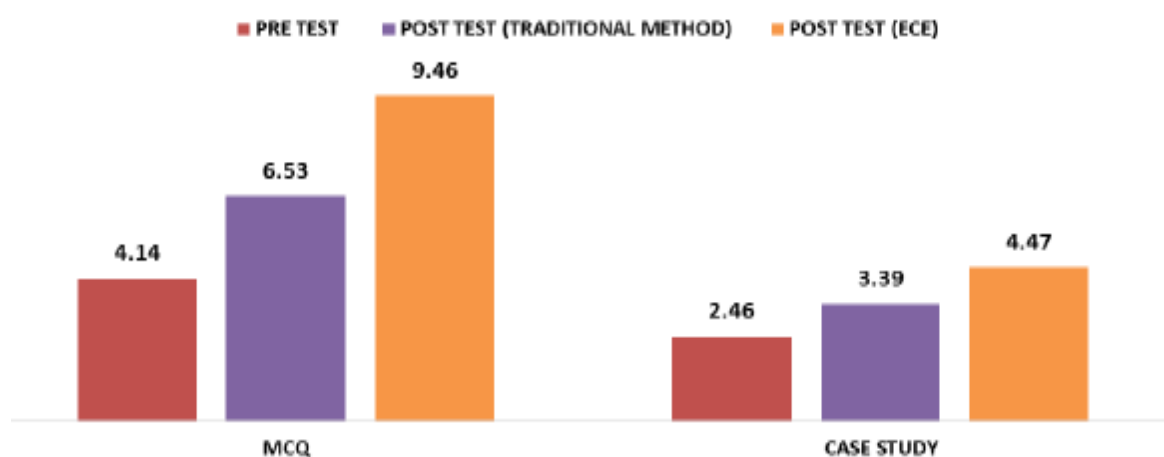
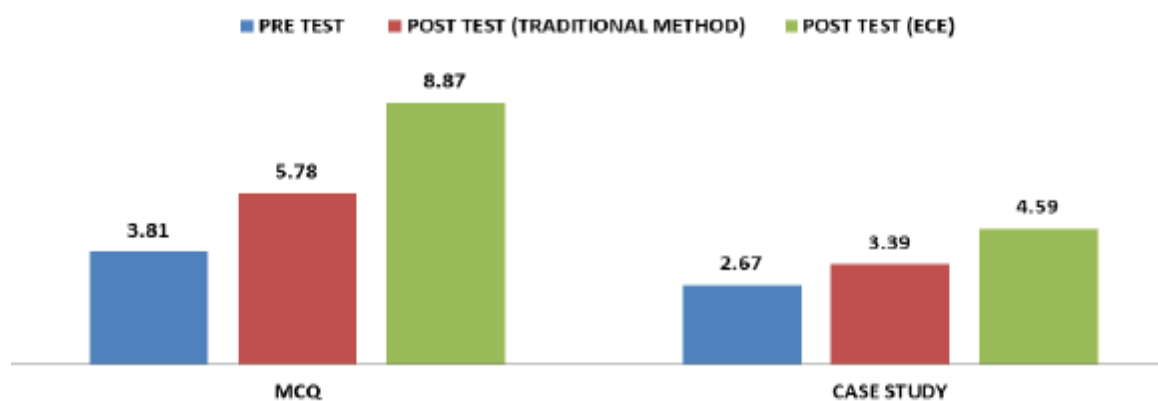


Fig. 2 Comparison of Difference of Scores of MCQ and Case Study of Hemoglobin Metabolism in Pre test and Post test of Control and Study Group



Open ended Questions to faculty

1. Comment on the faculty-student bonding through the new T-L method. 100% of the faculty agreed that ECE increased student-faculty bonding.

2. Comment on time allocated for the new T-L method.

Faculty felt that more man hours are required for the preparation of the session as they had to liaise with the clinical departments to include all relevant clinical details. In addition, all the faculty involved felt that they had to collaborate and come to a consensus so that they were on a similar footing.

3. Does this method enhance communication skills of students? How?

The faculty felt that it did enhance the communication skills of vernacular medium students as these students didn't defer from taking part in the discussions and asking questions as it was a smaller group compared to the larger group.

4. Were the students comfortable with this new form of T-L method. Opine.

Yes, the students found this method of teaching more interactive. Further, it changed the perspective of the student towards Biochemistry since very often biochemistry is considered a rote learning subject or going by the book. A non-clinical subject with the introduction of ECE became clinically relevant for the students.

5. Would you recommend this form of teaching for other topics . Opine. Yes, specially for topics aligned with other clinical department as it enhances critical thinking especially when co-relating it with a clinical scenario.

Discussion

ECE calls for a shift in philosophy from "Pedagogy" to "Andragogy". It is a T-L method that fosters exposure of medical students to patients, clinics or patient relevant material in Phase I itself so that it enhances learning of health, illness or disease. It allows higher order of thinking, covering higher levels of cognitive domain-application, analysis, synthesis and evaluation which is evident from the present study. The comparison of scores of MCQ's and case studies depicted in Table no 1 & 2 and Fig no 1 & 2 of Phase I students exposed to the traditional method of teaching and ECE in Acid base balance and Hemoglobin metabolism revealed that the students were able to interpret the laboratory reports and correlate it with the clinical findings with both the methods of teaching, but the scores of students exposed to ECE were statistically significantly higher ($p < 0.001$) as compared to those exposed to the traditional method ($p < 0.05$) for Acid base balance as well as for Hemoglobin metabolism. The ECE T-L method helped them to learn actively about the pathological condition and understand the importance of basic sciences in a clinical set up. The feedback obtained from the students and faculty about the effectiveness of ECE revealed that it is an useful, interactive and effective method of learning where there is retention of knowledge, better understanding of concepts and it also enhances critical thinking.

Conclusion

In a predominantly lecture driven curriculum, it is important to provide opportunities for a shift from "Pedagogy to Andragogy"-ECE can be considered as an effective method of teaching as depicted in the study wherein the scores of students exposed to ECE were statistically significantly higher ($p < 0.001$) as compared to those exposed to the traditional method ($p < 0.05$). Thus, it proved that ECE was not only effective in retaining knowledge, understanding concepts. But it also helped in correlating the basic science topics with the clinical conditions. Further, this method of teaching aroused interest in the subject of Biochemistry and was advantageous to the slow learners. In addition, the positive feedback received both from the faculty and students has confirmed the utility of ECE as a new T-L method in teaching Biochemistry.

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