



EVALUATION OF THE EFFECTIVENESS OF EARLY CLINICAL EXPOSURE IN LEARNING CLINICAL EXAMINATION SKILLS AMONG PRECLINICAL STUDENTS.

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ABSTRACT

Aim: This study was aimed to evaluate of the effectiveness of early clinical exposure in learning clinical examination skills among preclinical students and to explore the perspectives of ECE among the students and faculty Methods. Present analytical study was conducted on 99 first year medical students, (Out of 100 first year students, 99 students gave consent to participate in the study) in the Department of Biochemistry in collaboration with Department of Paediatrics, ASCOMS, Sidhra, Jammu. After obtaining informed, written consent pre-test questionnaire was given to the study participants. Students were allocated into Group 1 (n=49) and Group 2 (n=50) by simple random technique by lottery method. Group 1 students were trained on clinical examination of nephrotic syndrome in paediatric ward (Early Clinical Exposure) by paediatric faculty member using a patient and Group 2 students were trained on clinical examination of nephrotic syndrome in clinical biochemistry laboratory (Control) by biochemistry faculty using a subject. At the end of the session, knowledge domain was tested by post-test questionnaire, skill domain was assessed by Objective Structured Clinical Examination (OSCE) and attitude domain was tested by unstructured feedback in both the groups. In the next session, crossing over was done. Group 2 students were taken to paediatric ward and were taught clinical examination of jaundice by paediatric faculty using a patient and Group 1 students were taken to clinical biochemistry laboratory and taught clinical examination of jaundice by another biochemistry faculty using a subject. Both groups were assessed by post-test questionnaire and OSCE at the end of the session. Attitude of the students and perception of the faculty members towards ECE were assessed by a feedback questionnaire and analysed qualitatively. Results: There was a statistically significant difference present between the post test scores of Group 1 and Group 2 in nephrotic syndrome and jaundice ($p < 0.01$, $p < 0.001$) respectively. Also, there was a statistically significant difference present between Group 1 and Group 2 on OSCE scores in nephrotic syndrome and jaundice ($p < 0.01$ & $p < 0.01$ respectively). Conclusion: Results of the present study justify the need of Early Clinical Exposure to teach clinical examination skills to first year medical students when compared to the traditional teaching method.

KEYWORDS : Early clinical exposure, First year medical students, Clinical examination skills.

Introduction

Biochemistry is considered a dry, complex, but ever-evolving subject, where students are made to understand various biochemical reactions, enzymes, pathways, and regulations, without explicating any correlation with its clinical context. This combined with "container-dispenser" type of teacher-centred didactic lectures makes it very difficult for students to apply these concepts effectively in practice. Hence, most of the students become less attentive in classrooms, cannot understand the relevance of biochemistry in clinical practice, and cannot perform to the best of their abilities. Due to lack of adequate exposure, intense competition, and the traditional curriculum, where the students are engaged in long hours of classroom with no clinical exposure, there has been an urgent call for curricular reforms.

Recently, the Vision 2015 of National Medical Council states that the Indian medical graduate (IMG) should have the necessary competencies (Knowledge, Skills and Attitude) to assume his or her role as a health care provider to the people of India and the world.¹ So the goals of medical education should be learner-centred in which the student develops knowledge, skills and attitude respectively with cognitive, psychomotor and affective domains.² Early Clinical Exposure (ECE) is one of the measures taken by MCI to enact its vision. ECE focuses on the introduction of clinically relevant material in the class or observation of patient handling and doctor-patient communication in actual outpatient department setting at the very 1st year. It helps to improve learning in all the three domains – cognitive, psychomotor, and affective of a medical student, which are needed to transform our undergraduates to physicians of first contact of community. Several studies have been undertaken to explore the impact of ECE among the medical students, which indicate it an effective technique to supplement the traditional theoretical teaching. ECE improves the performance of fresh medical entrants in basic science, helps to relieve stress pertaining to patient handling, develops clinical reasoning, and produces good learning outcomes.³⁻⁵ In ECE, the clinical training is started from the first year, whereby sufficient clinical exposure is given at the primary care level that would be integrated with the learning of basic medical sciences. Introduction of

case scenarios for classroom discussion/ case-based learning also can be emphasized as a coordinated effort by the pre, para-clinical and clinical staff members.⁶⁻⁸

Subjects and Methods

Present analytical study was conducted on 99 first year medical students, (Out of 100 first year students, 99 students gave consent to participate in the study) in the Department of Biochemistry in collaboration with Department of Paediatrics, ASCOMS, Sidhra, Jammu. A separate orientation program was conducted for the students. (n=99) and faculty members of biochemistry and paediatrics department (n=7) separately about the purpose of the study and procedure. The permission was obtained from the Department head of Paediatrics to train students in the paediatric ward. After obtaining informed, written consent pre-test questionnaire was given to the study participants. Students were allocated into Group 1 (n=49) and Group 2 (n=50) by simple random technique by lottery method. Group 1 students were trained on clinical examination of nephrotic syndrome in paediatric ward (Early Clinical Exposure) by paediatric faculty member using a patient and Group 2 students were trained on clinical examination of nephrotic syndrome in clinical biochemistry laboratory (Control) by biochemistry faculty using a subject. The topics included were definition, pathophysiology, biochemical basis, sites to look for oedema, approach to the patient, management protocols and advice regarding diet. Each session lasting for 30 to 40 minutes. At the end of the session, knowledge domain was tested by post-test questionnaire (formulated by our department and peer reviewing was done among the faculty members), skill domain was assessed by Objective Structured Clinical Examination (OSCE) and attitude domain was tested by unstructured feedback in both the groups. In the next session, crossing over was done. Group 2 students were taken to paediatric ward and were taught clinical examination of jaundice by paediatric faculty using a patient and Group 1 students were taken to clinical biochemistry laboratory and taught clinical examination of jaundice by another biochemistry faculty using a subject. The topics included were definition, pathophysiology, biochemistry and site to look for jaundice, approach to the patient, management protocols and advice regarding diet. Both groups were

assessed by post-test questionnaire and OSCE at the end of the session. Attitude of the students and perception of the faculty members towards ECE were assessed by a feedback questionnaire and analysed qualitatively.

Statistical Analysis

Students paired t-test was used to compare the pre-test and post-test values and Students unpaired t-test was used to compare post-test scores between Group 1 and Group 2. P < 0.05 was considered as statistical significance.

Results

Baseline comparison of pre-test scores on nephrotic syndrome and jaundice between Group 1 and Group 2 scores shows that the groups were comparable (P= 0.29, P=0.57 respectively)(Table 1). There was a statistically significant difference present between the post-test scores of Group 1 and Group 2 in nephrotic syndrome and jaundice (p < 0.01, p< 0.001) respectively (Table 1). Also, there was a statistically significant difference present between Group 1 and Group 2 on OSCE scores in nephrotic syndrome and jaundice (p < 0.01, p< 0.001) respectively. Qualitative data on student feedback suggests that many students and faculty members felt that ECE is a useful, interesting tool for learning clinical examination skills. (Figure 1 & 2).

Table 1: Comparison of Pre-test and Post-test scores between Group 1 (n=50) and Group 2 (n=49):

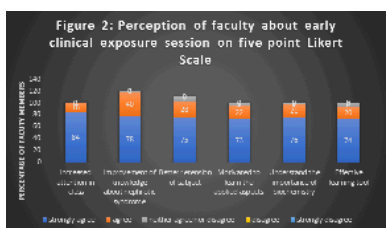
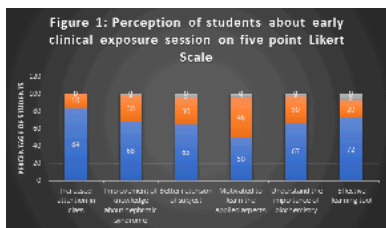
Parameters	Group 1 (n=50)		Group 2 (n = 49)	
	Pre- test	Post – test	Pre- test	Post - test
Nephrotic syndrome	5.31 ± 1.62	7.59±1.65**	5.64± 2.69	6.34 ±1.35
Jaundice	5.16 ±1.45	5.62±1.26	7.29 ± 1.77**	8.35 ± 1.36

Values are expressed as Mean ± SD. Analysis for comparing pre-test and post-test scores in each group was done by Student’s paired t-test. (+) Comparison of post-test scores between Group 1 and Group 2 were done by Student’s unpaired t-test (*). *p < 0.01 is significant **p<0.001 is highly significant

Table 2: Comparison of OSCE scores between Group 1 (n=50) and Group 2 (n=49):

Parameter	Group 1(n=50)	Group 2 (n=49)
Nephrotic syndrome	7.59±1.70**	5.62±2.14
jaundice	6.1±1.49	7.88±1.56**

Values are expressed as Mean ± SD. Analysis for comparison of OSCE scores between Group 1 and Group 2 was done by Student’s unpaired t-test. *p < 0.01 is significant **p<0.001 is highly significant



Discussion

ECE calls for a shift in philosophy from “pedagogy” to “andragogy.” It is a teaching and learning methodology which fosters exposure of medical students to patients, clinics, or patient’s relevant materials as early as the 1st year of medical college, in a social or clinical context that enhances learning of health, illness, or disease.9 ECE allows higher order of thinking, covering higher levels of cognitive domain – application, analysis, synthesis, and evaluation.10 Nowadays ECE program is recommended as a component of undergraduate medical education curriculum.11 This kind of learning may enable student to interpret clinical findings on the basis of basic concept of first

professional subjects such as clinical or applied biochemistry. Hence, students can correlate the previous knowledge with the patient’s history and laboratory reports, can learn actively about the disease, and can understand the importance of basic sciences in clinical setup.

In our study we found that there was significant difference in the scores obtained by ECE and control groups. The students trained by ECE were benefitted more when compared to the control group as it is evident from the scores of ECE group on the learning modules of nephrotic syndrome and jaundice. These results are similar with the previous study reports by Motilal Et al (2014) in which the students exposed to ECE in the form of case-based discussion on breast cancer topic scored good marks compared to traditional teaching.12 A study by Solomon et al (2007) which studied the attitude of medical students towards ECE in learning endocrine physiology on 56 medical students reported that the feedback of the participants was favourable towards ECE. The students felt that ECE increases the interest for the subject and motivate them to read more. They also felt that ECE enhanced their understanding of endocrine physiology, enabled them to remember the subject better, contributed to their knowledge of the subject and also helped them to integrate their knowledge. Also, many students said that ECE increased their sensitivity toward patient problems and needs. The majority of the students (96.4%) in their feedback gave an overall rating of the program as good to excellent on a 5 point Likert scale.13,14 Another study by Spencer J et al (2000) found that direct contact of medical students with patients play a crucial role in the development of clinical reasoning, communication skills, professional attitudes and empathy.15 Bokken et al (2009) also reported the similar results stating the importance of patient involvement in medical education.16 Correlating applied biochemistry by ECE will enable students to understand the relevance of underlying scientific knowledge and principles of clinical medicine. Self-directed learning and understanding by this method will help them to recall the knowledge and practical application of information and lead to the formation of a better clinician, thus benefiting the self, people, and society.

Student’s Perception Most of the students felt that ECE helped them in understanding the topic and they were able to relate the topic to the clinical set up. Also, in comparison to the other systems 90% of the students felt that ECE helped them to understand the concepts better. Also, in majority of the students (74%) opinion ECE was interesting and increased attention in class. About 58% of the students felt that ECE will be helpful in better understanding of subject in class and 74% felt that ECE should be incorporated in the routine schedule as it is an effective learning tool. Few students felt that the number of clinical cases was low, time was not adequate and they have to wait for their turn to examine. They also felt that in selected topics ECE can be conducted rather than all the topics.

Faculty’s Perception Most of the faculty members involved in the present study opined that ECE is an effective learning tool (74%), better retention of the subject (65%). Also, they agreed that ECE will be helpful in understanding the topic (68%) and to increase attention in class (84%). However few faculties pointed out that ECE necessitates adequate manpower, resources and coordination from concerned clinical departments for conducting ECE programs.

Conclusions Students must be made aware of the clinical and diagnostic relevance of biochemistry. Curriculum innovation in the form of ECE was perceived as a good intervention, efforts in designing and implementing such session were applauded, and relevance of biochemistry in clinical setup was well perceived by the students.

Limitations of the study:The study was conducted with two clinical scenarios with single batch of students only. A multi centric study with a greater number of participants is needed for the definite conclusion.

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Conflicts of interest There are no conflicts of interest.

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