



Effectiveness of case based learning over traditional teaching methods in Phase II MBBS students

Sushma Yalavarthi^{1*}, Sruthi Deshpande²

¹ Professor & amp HOD, Department of Pathology, Mamata Medical College, Khammam, Telangana, India

² Department of Pathology, Mamata Medical College, Khammam, Telangana, India

Abstract

Background: Case Based Learning (CBL) in Pathology is considered essential, as it is a bridge between Phase I and phase III Subjects. CBL would bring about learning of pathological and clinical features of diseases in an integrated easy manner, resulting in growing of interest in undergraduate medical students to learn pathology with better retention of knowledge.

Aim: The present study aimed to evaluate the effectiveness of Case Based Learning over Traditional teaching as a Teaching Learning Method in Pathology teaching of Undergraduates and to assess the perception of students to CBL by Pre-validated questionnaire.

Materials and Methods: Total Two hundred, 3rd and 5th semester students of Phase II MBBS who volunteered, included in the study after permission from institutional ethical committee.

Results: A paired t- Test comparing CBL and Didactic lecture showed that the scores following case based learning were more compared to didactic lectures and the variation of results were more in 5th semester students than in 3rd semester students.

Conclusion: Didactic lectures followed by CBL sessions will give good results and outcome. CBL is effective method to teach pathology in increasing the depth of knowledge.

Keywords: case based learning, didactic lecture, pathology

Introduction

Current competency Based Medical Education is more learner - centric, patient- centric and outcome oriented. There is a paradigm shift of teacher centered approach to student- centered active learning to possess requisite knowledge, skills, attitudes, values and responsiveness so that he or she may function appropriately and effectively as a physician of first contact of the community while being globally relevant. There is an immense need to create the environment in problem-solving, critical thinking and reasoning, and other skills, which have become a must attribute for a successful doctor^[1]. An innovative Case Based learning forms an important part of Medical Curriculum. There is not a set definition for CBL. An excellent definition has been proposed by Thistlewaite *et al* in a review article. In their 2012 paper, a CBL definition was “The goal of CBL is to prepare students for clinical practice, through the use of authentic clinical cases. It links theory to practice, through the application of knowledge to the cases, using inquiry-based learning methods”^[2] The present study aimed to facilitate analytical thinking and decision making of undergraduates by case Based Learning.

Material & methods

The present comparative study was conducted in the Department of Pathology. Total 100 students each from 3rd & 5th semester of Phase II MBBS who volunteered were considered for the study. Students who were not willing and absentees were excluded from the study. Institutional Ethical Committee approval was obtained. Students of 3rd semester were divided into two groups (A&B) of 50 members each.

Two sessions of case based learning was planned in the small group teaching (SGT) Sessions in the time table of 3rd semester

students. Topics were randomly selected. One was sickle cell anemia. Another topic was bronchogenic carcinoma. While taking sickle cell anemia topic, we divided the batch into half. For the half batch, we have taken didactic lecture by PowerPoint presentation with LCD projector. The duration of the class was 2 hours. One hour lecture followed by post test in the next hour. For the other half, in the next SGT session, same topic of sickle cell anemia was taken by different facilitators from medicine followed by pathologist, but used case based learning. For that they started their power point by showing the case sheet and discussing the details of one sickle cell anemia patient and showed the peripheral smear of that patient by microscope attached LCD. Facilitators also projected the hemogram values (sysmex cell counter values), followed by aetiopathogenesis. After one hour, post test was done. The questionnaire was same for both the batches on sickle cell anemia. 15 questions of short answer type and multiple choice questions, pertaining to sickle cell anemia were given and scores were analysed. Same protocol was followed for bronchogenic carcinoma also.

For the 5th Semester students, we have taken gastrointestinal system by didactic lectures with power point by using LCD projector. At the end of that system, Post test was conducted. Scores were tabulated. In the next revision tutorial class, we called for general surgeon and he discussed different case scenarios of gastrointestinal system along with clinical features by power point. Example of case scenario was –

A 58-year-old man has had increasing difficulty swallowing for the past 6 months and has lost 5 kg. No abnormal physical examination findings are noted. Upper GI endoscopy reveals a nearly circumferential mass with overlying ulceration in the mid

esophageal region. Biopsy of the mass reveals pink polygonal cells with marked hyperchromatism and pleomorphism. What is the provisional diagnosis?

The duration of case based session was 2 hours. Again test was conducted with same questionnaire after 1month. Results were analysed and perceptions were taken. For both the semesters, facilitator's feedback was taken. They expressed that, prior to case based learning, they didn't get concepts and by hearted the topic. Case based learning is helpful in getting concepts and clear understanding.

The tests were aimed at assessing the knowledge on the topic/disease before and after the intervention. A Pre- validated

questionnaire with few closed ended and few open ended questions, were given to the students and assessed by 5 point Likert's scale. (Strongly Disagree-1, Disagree-2, Neither Agree nor Disagree (Not sure)-3, Agree-4, and Strongly Agree-5). [Fig 1]

The data was analyzed using the SPSS software version 20. The comparative study of post-test results of Didactic lecture and CBL were analyzed by paired t test method. p value less than 0.05 was considered significant. The perception of students towards CBL was assessed using frequency percentage method.

Legends for the figures

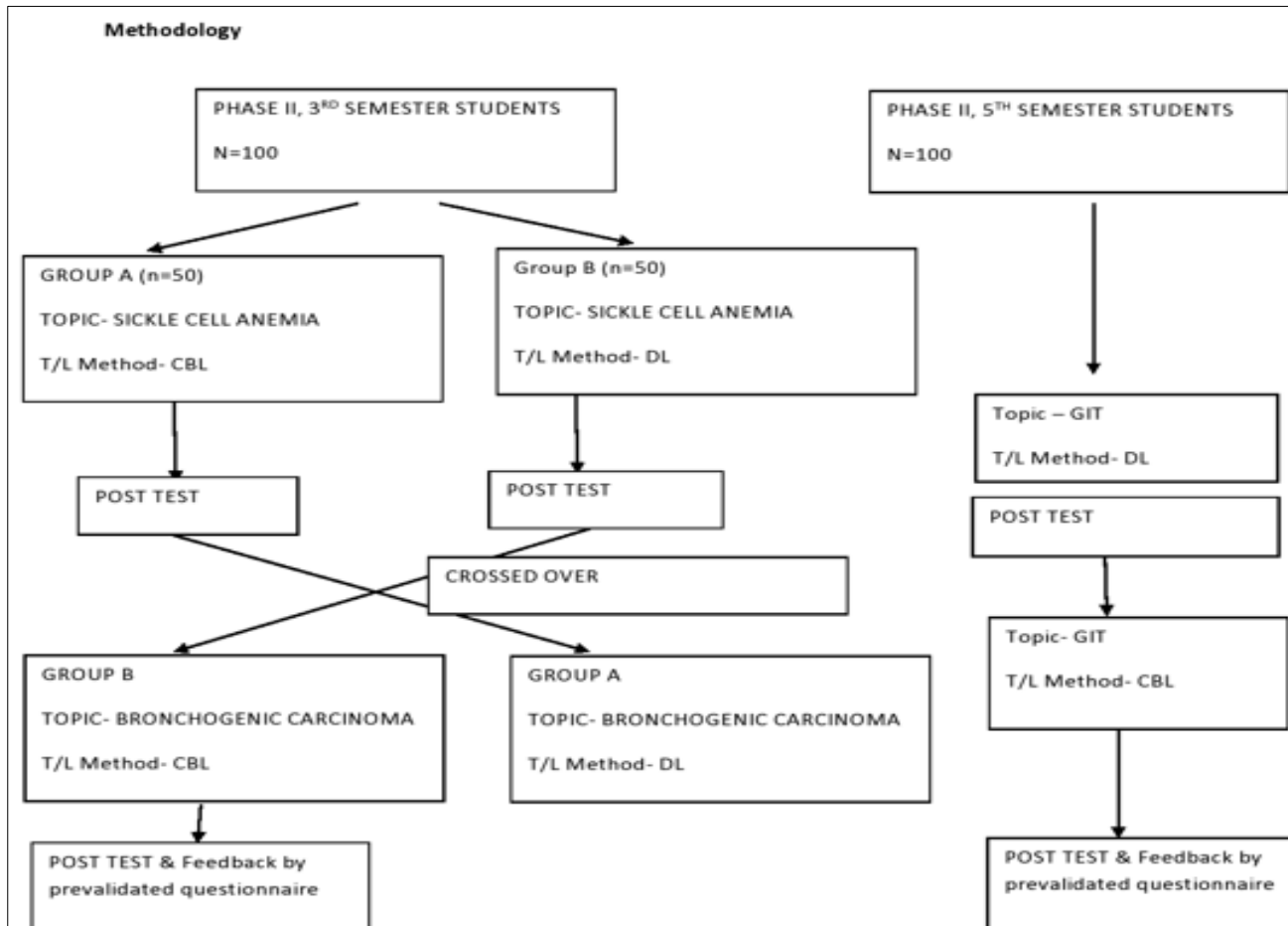


Fig 1: Methodology among Phase II MBBS students.

Results

Total number of participants' students was 200. 100 3rd semester students and 100 5th semester students, who volunteered, were included in the study. For A batch of 3rd semester students, sickle cell anemia was taken by CBL and For B Batch, same topic was taken by DL. Post test was conducted for both the batches and compared the results. Post test scores were high after CBL than DL, and statistically significant. [Table 1].

In the next session groups were crossed over and the topic was Bronchogenic Carcinoma. Post test results were compared. [Table 2]

For the students of 5th semester, Gastrointestinal Tract was taken by DL followed by CBL sessions in revision tutorials. One Pre-test (After DL) and one Post- test were conducted before and after

CBL Session. The results were high after CBL and students felt that CBL Sessions were very useful to attain Knowledge. [Table 3]

A paired t- Test comparing CBL and Didactic lecture showed that the scores following case based learning were more compared to didactic lectures and the variation of results were more in 5th semester students than in 3rd semester students.

A Pre- validated questionnaire with few closed ended and few open ended questions, were given to the students and students perceptions towards CBL was assessed using frequency percentage method by 5 point Likert's scale. (Strongly Disagree-1, Disagree-2, Neither Agree nor Disagree (Not sure)-3, Agree-4, and Strongly Agree-5). [Tables 4 & 5]

Table 1: Comparison of post- test scores of DL and CBL in 3rd Semester Students (Sessions on Sickle Cell Anemia)

TL Method	Evaluation tests(MCQ)	Mean score+ SD	Paired t- Test	Significance (n=50)
DL	Post - test	9.82+ 2.173	11.478	0.0000 (P<0.0001) Significant
CBL	Post -test	10.92+ 1.936		

Table 2: Comparison of post-test scores of DL and CBL in 3rd Semester (sessions on Bronchogenic carcinoma)

TL Method	Evaluation tests(MCQ)	Mean score+ SD	Paired t- Test	Significance (n=50)
DL	Post - test	8.34+ 2.91	12.971	(P<0.0001) Significant
CBL	Post -test	10.86+ 1.85		

Table 3: Comparison of effectiveness of CBL in 5th semester revision tutorials (sessions on Gastrointestinal tract)

TL Method	Evaluation tests (MCQ)	Mean score+SD	Paired t- Test	Significance (n=100)
DL	Post - test	3.3+ 1.18	30.058	0.0000 (P<0.0001) Significant
CBL	Post -test	6.44+ 1.297		

Table 4: Students’ Feedback questionnaire scores analysis of 3rd semester (n=100)

(A) Closed ended questions

Sr. No.	Questions	Strongly agree (5)	Agree (4)	Not agree, nor disagree (3)	Disagree (2)	Strongly Disagree (1)
1	CBL stimulated my desire to learn.	56 (56.00%)	34 (34.00%)	8 (8.00%)	2(2.00%)	0 (0.00%)
2	I feel confident to apply basic science and pathology concepts to solve clinical cases	32 (32.00%)	40 (40.00%)	26 (26.00%)	2 (2.00%)	0 (0.00%)
3	CBL is good method to practice integration of knowledge and skill.	56 (56.00%)	34 (34.00%)	4 (4.00%)	4 (4.00%)	2 (2.00%)
4	CBL improved my clinical reasoning ability	48 (48.00%)	44 (44.00%)	6 (6.00%)	2 (2.00%)	0 (0.00%)
5	I don't think CBL is better than traditional teaching.	2 (2.00%)	0(0.00%)	18 (18.00%)	60 (60.00%)	20 (20.00%)
6	I was motivated to learn pathology by CBL	20 (20.00%)	68 (68.00%)	8 (8.00%)	4 (4.00%)	0 (0.00%)
7	The CBL helped to reinforce concepts taught in class	42 (42.00%)	52 (52.00%)	4 (4.00%)	2 (2.00%)	0 (0.00%)
8	CBL is time-consuming and hinders the normal speed of the classes.	4 (4.00%)	14 (14.00%)	24 (24.00%)	44 (44.00%)	14 (14.00%)
9	CBL has increased my selfconfidence and attitude towards learning	42 (42.00%)	50 (50.00%)	8 (8.00%)	0 (0.00%)	0 (0.00%)
10	I was not comfortable during CBL discussion sessions.	2 (2.00%)	4 (4.00%)	18 (18.00%)	54 (54.00%)	22 (22.00%)
11	CBL improved my communication skill and team work	40 (40.00%)	54 (54.00%)	6 (6.00%)	0 (0.00%)	0 (0.00%)
12	The emphasis on clinical concept was detrimental to learning pathology	32 (32.00%)	22 (22.00%)	20 (20.00%)	18 (18.00%)	8 (8.00%)

(B) Open ended questions

Q1. What is the suggestion that you would like to give to change CBL technique of Learning?

Q2. What are the advantages did you noticed in CBL over Didactic Lecture?

Table 5: Students’ feedback questionnaire scores analysis of 5th semester (n=100).

(B) Closed ended questions

Sr. No.	Questions	Strongly agree (5)	Agree (4)	Not agree, nor disagree (3)	Disagree (2)	Strongly Disagree (1)
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