Introduction Of Case Based Learning In Teaching Of Biochemistry In IGIMS Patna.

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Abstract: Background & Objectives: Biochemistry is the basic science subject of first year MBBS course. It describes all the biochemical reactions occurring in the body, which makes the subject difficult and the student looses interest in it. In our institute, teaching is done mainly by didactic method. We introduced case based learning method (CBL) for teaching. The objective of this study was -1. To compare score of students by two methods of teaching – traditional lectures and case based methodology. 2. To evaluate student's feedback regarding their perception to case based learning. Methods: After getting written consent from 1st year MBBS students , they were divided into two groups. One group (50 students - case) was taught by case based learning method and another group (50 students control group) was taught by traditional method. Improvement in their performance was assessed by MCQ and statistically compared. Perception of both groups about CBL was taken by a set of questionnaire based on Likert's scale. Results: Statistically significant increase in performance of student taught by CBL method than student taught by traditional method was seen. Student's and faculties's perception about CBL was positive. All students found the CBL as effective method for learning. Conclusion: CBL is a good teaching learning method to increase involvement and interest of student in learning and enhance their academic performance. [Dr. Rekha K NJIRM 2016; 7(5):82-86]

Key Words : CBL - Case Based Learning , TL – Traditional Learning

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Introduction: Studies indicate that the majority of MBBS students take a surface approach to learning, associated with only memorization of material, rather than a deep approach, which implies higher cognitive processing. This behavior relates to poorer outcomes, including impaired course performance and reduced knowledge retention[1].

Clinical biochemistry is concerned with methodology and interpretation of biochemical tests performed on body fluids and tissues, to support diagnosis, treatment and monitoring of disease[2].But students are not much interested in the subject due to two main reasons -

- Instruction in medical education since long is mainly didactic which is teacher centered and participation of students is passive.
- There are a large number of metabolic pathways and chemical reactions.

So, some change in teaching learning method is required which can develop interest of students in biochemistry by their active participation and also develop the ability to correlate this knowledge in diagnosis, treatment and follow up of a disease in their professional carrier. An innovative method of teaching learning is case based learning (CBL). Case-Based Learning is often defined as a teaching method which requires students to actively participate in real or hypothetical problem situations, reflecting the kinds of experiences naturally encountered in the discipline under study[3].

Case-based learning (CBL) is a long established pedagogical method, which is defined in a number of ways depending on the discipline and type of 'case' employed. Basic, social and clinical sciences are studied in relation to the case, are integrated with clinical presentations and conditions (including health and ill-health) and student learning is, therefore, associated with real-life situation[4].

Case-based learning (CBL) is student-centred and interactive; however, students use previously acquired knowledge to solve problems that are designed to mimic future professional practice[5].A challenge in medical education is the planning of a lesson which make the student to gain maximum knowledge in short span of time[6]. The case-based format requires students to recall previously covered material to solve clinical cases, which are based on clinical practice[7]. As a result of this, students can have a meaningful learning, wherein the learner is motivated for effective learning rather than just the dispensing of information[8]. Case based learning (CBL) is a method which exposes the student to real medical problem and motivates the learner to apply their analytical skill. In fact, it is now an established active learning tool which aims at developing reasoning skills, based on the clinical scenarios and

hence, a medical student understands the importance of the basic medical science subjects[9].

The aim of this study was to introduce CBL as teaching learning method and determine its impact on learning of biochemistry to MBBS students in IGIMS Patna and to analyze the perception of students about CBL as teaching learning method.

Objective:

1. To compare score of students by two methods of teaching – traditional lectures and case based methodology.
2. To evaluate student's and faculties's feedback regarding their perception to case based learning.

Method: This is an experimental comparative study, which was conducted in the Department of Biochemistry, Indira Gandhi Institute of Medical Sciences Patna, India during six months period. Pre and Post test and prevalidated questionnaire (based on Likert's scale) were used as tools for data collection. Hundred students of first year MBBS course (2014-15 batch) of IGIMS Patna were included in this study. Approval from Institutional Ethics Committee was taken. Informed written consent from the students were taken. The faculties and students were introduced about CBL. The students were divided randomly into two groups. Four topics from core of the syllabus – Diabetes mellitus, Hypothyroidism, Jaundice and Gout were chosen and module were formed. These topics were taught to one group(control group) of students by the old traditional lecture method and other group(Case group) by CBL method. Study of each module by CBL method was completed in two sessions. In the first session the module was discussed in the group. A facilitator was present at the time of discussion to ensure participation of every student. Assessment of performance of both groups before teaching was done by a set of pre validated questionnaire based on those topics. Now the control group was taught by traditional didactic method and case group by CBL method. Again assessment was done by set of questionnaire.

Result of both groups were compared statistically and improvement in knowledge after teaching by CBL method in comparison to traditional method was calculated as mean and standard deviation. After the completion of this study both the group were interchanged for the teaching method to avoid ethical issue. Kassebaum et al[10] and Engel and Hendricson[11] employed a quasi crossover methodology whereby the two control groups were used: one group being taught under CBL conditions and the other through didactic lecture format. This allowed the authors to compare between the two groups.

To know the perception of student's and faculty's about CBL, their response to 4 point Likert Scale questionnaire were taken in the form of agree, strongly agree, disagree and strongly disagree

Observation and Results: Results of this study has been reflected in two forms – evaluation test score and response to Likert's 4 point scale which is shown in the table given below. No significant association was seen between pre study score of CBL and control group. But significant increase in performance of students taught by CBL method than student taught by traditional method was seen in post study score. Feedback of students and faculty about CBL was positive.

Table No – 1Comparison of test score between 'Before' and 'After' study

	Before Study	After Study	P value
CBL group	49.0 ± 4.7	60.8 ± 2.9	< 0.05
Control Group	49.5 ± 5.8	55.1 ± 4.7	< 0.05

Table No- 2 Inter group Comparison of test score between CBL and Control group before and after study

	CBL group	Control Group	P value
Before Study	49.0 ± 4.7	49.5 ± 5.8	> 0.05
After Study	60.8 ± 2.9	55.1 ± 4.7	< 0.05

Discussion: In our study, pre and post test score of CBL and traditional group was compared both within and between the two groups. A significant increase in post test score was found in the group taught by CBL method in comparison to traditional method. These results are similar to other studies which show improved test scores post CBL session[12,13,14] . According to a study by a researcher, CBL enhances students ability to synthesize, evaluate and apply information and concepts[15], and this may be the reason for improvement in post test score.

Table 3:Student's Perception about CBL (n = 100)

No	Question	Agree	Strongly Agree	Disagree	Strongly disagree

1	CBL is an effective method of learning	0	100 %	0	0
2	Along with didactic method , CBL will be more useful.	0	100 %	0	0
3	CBL session is very important to develop analytical skill.	0	100 %	0	0
4	CBL model will be useful in future application of knowledge.	0	100%	0	0
5	CBL session motivated me to explore about the topic given .	0	100 %	0	0
6	Promoted meaningful learning than the didactic lecture.	5 %	95 %	0	0
7	Role of facilitator was very important in CBL session.	10 %	90 %	0	0
8	Group discussion during the CBL session was very useful.	2 %	98 %	0	0
9	CBL will help in the correlation, diagnosis and treatment of clinical cases in future.	4 %	96 %	0	0
10	CBL is essential in medical education from 1st year	0	100 %	0	0

Table 4: Faculty Perception about CBL (n = 6)

No	Question	Agree	Strongly Agree	Disagree	Strongly disagree
1	CBL as TL method is better than traditional method	2 (33.3 %)	4 (66.6 %)	0	0
2	CBL increases interest of students in subject	3 (50 %)	3 (50 %)	0	0
3	CBL will be more useful for correlation of biochemical findings with disease diagnosis and treatment	2 (33.3 %)	4 (66.6 %)	0	0
4	CBL promotes self learning	2 (33.3 %)	4 (66.6 %)	0	0
5	CBL induces group dynamics	3 (50 %)	3 (50 %)	0	0
6	CBL increases analytical skill	0	6 (100%)	0	0
7	CBL motivates students to gather information about the subject from different sources.	2 (33.3 %)	4 (66.6 %)	0	0
8	CBL is essential in medical education from 1st year	0	6(100%)	0	0

Student's Feedback: Keeping in mind the role of CBL in improvement of academic performance of students, we evaluated the perception of students about CBL.

Perception of students about CBL method of teaching learning was positive. They enjoyed the method of CBL and group discussion. This is similar to the finding of Albanese MA et al[16] & Des Marchais JE[17] who found that most students enjoy the active participation and consider the process to be clinically relevant and stimulating. 100 % participants found it effective, more useful, important to develop analytical skill, and motivating and all the students wanted CBL method of teaching learning should be started from first year of MBBS course. Similar finding was found by other researchers[18,19]. 90% students felt the role of facilitator very important in CBL session.

Faculty's feedback: We took feedback from faculties also. Their response about CBL was positive. All the faculties found CBL as better than traditional method of teaching learning, helpful in improving analytical skill and felt that this method should be incorporated from 1st year MBBS course itself. Two third faculties strongly agreed about the role of CBL as promoter of self learning, motivator for exploration of knowledge and helpful in correlation of biochemical finding with clinical diagnosis and treatment whereas rest one third also agreed that CBL is helpful in all the above mentioned aspects.

Evaluation test score and students and faculty feedback about CBL shows that it is a very good approach for improvement of students performance. It improves the analytical skill which is essential for medical profession. Similar report was found in a study in which the majority of students indicated that CBL stimulated academic challenge, personal interest and involvement in the subject matter and offered a sharply realistic perspective from which to apply course content[20]. In fact, it is now an established active learning tool which aims at developing reasoning skills, based on the clinical scenarios and hence, a medical student understands the importance of the basic medical science subjects[9]. In earlier days,

the teaching method was teacher centered but these days, the education system is changing to a student centered teaching–learning process with the use of various innovative teaching methods. This makes the students actively involved in the process of learning and thus prepares them for a lifelong self directed learning process[21].Our results were supported by some of the other medical education researches, which stated that CBL could help in developing an effective learning environment, with the use of specific learning objects[22,23,24].

Limitation: As CBL method require more time, it becomes difficult to teach all the topics by CBL method. Extensive preplanning, preparation of module and sensitization of students and faculty is a cumbersome job.

Conclusion: CBL is found to be a very good teaching learning method which acts as a stimulus for the students to explore more and more from different sources and enhance their performance and analytical skill. Students found this method more useful for learning, developing analytical skill and interpretation for diagnosis and treatment of disease. Therefore CBL should be introduced as essential teaching learning method for teaching biochemistry.

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