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IMPACT OF TEACHING CLINICAL ASPECTS OF CARDIOVASCULAR PHARMACOLOGY AT BEDSIDE

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ABSTRACT: Introduction: Medical students of present era have to prove their efficiency in every step of life. To do so one has to become a competent doctor. This is possible only with the proper knowledge and application of the rational therapeutics in clinical practice. This can happen when the students are motivated and taught medicine in such a way that can produce better learning. The clinical aspect of medicine is usually touched in very theoretical way at present. This way of teaching pharmacology lacks the proper correlation of medicine and the disease (and patient). Students are hesitant in using the drugs related to cardiovascular system and are unable to handle the cardiovascular emergencies. Students practice irrational therapeutics. With this background idea, this project was taken up to enable our students to get better understanding of medicines. The project was a type of pilot study of its own kind to explore new mode of supportive teaching of pharmacology. **Aim and Objectives:** To know the impact of bedside teaching of clinical aspects of cardiovascular pharmacology. **Methodology:** The students were divided in three groups of 20 students in each group. Each group was taught cardiovascular pharmacology in didactic lectures as routine in the lecture theatre simultaneously. This was followed by either tutorial classes of cardiovascular pharmacology or bedside teaching of the same. A total of four chapters were considered for the project. After covering two chapters the groups were crossover. Third group worked as control and was on tutorial classes throughout the study. Assessments were done four times (Pre intervention assessment, after the completion of first two chapters, after completion of two more chapters, after a gap of one month from the last test). The preintervention assessment was to remove the data of students with extremes. (Too good or Too poor). **Results:** Three batches of students were selected with 20 students in each. The assessment results show that the students taught at bed side had more information regarding the clinical aspects. The most important finding was that the dosage form and dose remembrance of important drugs was much high in the group which was taught by bedside as compared to the tutorials. **Conclusions:** The project is only a type of pilot study. We need more such type of study from the other faculty members, other departments as well as other institutes. Then only we can draw any firm conclusion regarding the impact of this type of teaching of clinical aspects of pharmacology. Simultaneously due to constraint of time and resources the feasibility issues are major challenges.

INTRODUCTION: To training students regarding rational therapeutics is the prime aim of pharmacology teaching. Students should be aware of the every aspect of medicines with proper scientific learning. Pharmacology as a subject has been taught in orthodox manner since past. Teachers as well as students don't see its importance in clinical practices. These reasons have blamed pharmacology as one of the most disliked subject by the medical students. Presently pharmacology teaching is facing major challenges. At most of institutes of India Pharmacology teaching comprises of a series of didactic lectures using power point presentations (or other audiovisual aids), practical pharmacology which includes animal experiments, pharmacy practical (though these have been reduced to the extent of elimination in most of the medical institutes) and some topics of clinical pharmacology.

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Some exercises on rational therapeutics are also taught either during practical or during tutorials. Tutorials are taken in small group with the aim to have active participation of both teacher and student on the allotted and already covered topic.

All these teaching process is spread throughout academic year with some tests, terminal examinations, and quiz. During this whole academic year students though taught medicines but never get chance to actually see these medicines to be used in real clinical world. As we know that theoretical knowledge is gained as well as forgotten very quickly and easily. Most of the students have intentions to read pharmacology just to get through the examinations rather than keeping that knowledge which will be useful throughout their life. This type of attitude is missing in present style of teaching pharmacology. Attempts have been made all over India to make the teaching of pharmacology more interesting and relevant. To make pharmacology teaching more innovative and interesting learning experience, efforts have been made by formulating new educational strategies to meet the educational objectives [1-7]. Present study is an effort to know the effect of teaching pharmacology (important clinical aspects) in the bedside along with the didactic lectures.

Aim and Objectives:

1. To know the impact of bedside teaching of cardiovascular pharmacology to medical undergraduates.
2. To introduce a new type of learning methodology for the clinical aspects of cardiovascular pharmacology.

Study Design: Study was done on medical students of MBBS second professional. Prior orientation regarding this activity was given to the students and the faculty involved in the project. Freedom of choice was given to students to join the project or not to. Study was carried out over a period of 7 months, from April to November 2013. Evaluation of the students was done by faculty not involved in teaching of cardiovascular pharmacology of present session. The students were taught first in the didactic lecture on cardiovascular pharmacology taken by teacher as routine. This was followed by the division of students in three groups of 20 students each (Group A, Group B and Group C). Group A was selected for the first bedside learning batch (for first two chapters). Group B was the second bedside learning batch (for next two chapters). Group C was taught by tutorials throughout study. The students were exposed to a pre intervention test (to know the homogeneity of groups). This was of objective type question paper comprising of 30 questions covering topics already taught (General pharmacology, Autonomic, CNS). Each question was of multiple choice questions type with 1 mark for each correct answer. There was no negative marking.

The timing of test (duration of 30 minutes) was during the lunch hour (So the routine teaching of students is not hampered) The study was carried in three phases. In phase one the groups A was taken for the bedside teaching. While group B was taught in tutorial classes. Group C was also taught in tutorial classes. This was followed by MCQ type of test (30 questions, 30 minutes, 30 maximum marks) covering the topics. In phase two the groups were cross over. Group A was taught in tutorial classes while group B was taken for the bedside teaching. Group C was again taught in tutorial classes. This was again followed by MCQ type of test (30 questions, 30 minutes, 30 maximum marks) covering topics of this particular session.

In phase three no intervention was done for one month. After a gap of one month from the last assessment each group was again evaluated by MCQ type of test (30 questions, 30 minutes, 30 maximum marks) covering all four chapters. The students were not told that they will be exposed to the post intervention test (to reduce the bias). One of the junior colleagues was trained regarding the style of bedside teaching of pharmacology. How to maintain discipline at wards, what to show what not to show. What questions to be asked in the ward from the patient and attendants. How to read and explain the bed side medicine chart, medicine rapper, IV lines, oxygen, infusion pumps etc. To reduce bias it was requested to junior colleague to take the teaching at bed side. Tutorial classes were conducted as routine. Students were also told to fill the feedback form regarding the teaching in pharmacology without mentioning their identity. This type of pharmacology teaching was first of its kind in my institution.

RESULTS: A total of three batches (twenty students of each) of second professional students were enrolled in the study. Out of all, few students did not come for the tests at different phases of study. The total number of students who came for the tests according to the batch and the phase is as follows.

- **Group A:**
  - Number of students for inclusion – 20 students
  - Number of students participated in Pre-intervention test- 18
  - Number of students participated after phase I of study – 18
  - Number of students participated after phase II of study- 16
  - Number of students participated after phase III of study- 14

- **Group B:**
  - Number of students for inclusion – 20 students
  - Number of students participated in Pre-intervention test- 16
  - Number of students participated after phase I of study – 17
  - Number of students participated after phase II of study- 19
  - Number of students participated after phase III of study- 15

- **Group C:**
  - Number of students for inclusion – 20 students
  - Number of students participated in Pre-intervention test- 14
  - Number of students participated after phase I of study – 13
  - Number of students participated after phase II of study- 13
  - Number of students participated after phase III of study- 12

Marks (Mean±SE) obtained by the groups at different time intervals is as follows:

TABLE 1: (MARKS OBTAINED AT THE TIME OF ENROLMENT IN STUDY)

Group	Marks Obtained (Mean±SE)
Group A	22.2±3.6
Group B	19.9±2.8
Group C	21.7±3.8

TABLE 2: SHOWING THE MARKS OBTAINED BY DIFFERENT GROUPS AFTER COMPLETION OF PHASE I OF STUDY (GROUP A WAS EXPOSED TO THE BEDSIDE TEACHING)

Group	Marks Obtained (Mean±SE)
Group A	19.6±2.6*
Group B	13.9±2.3
Group C	14.7±3.4

*P<0.05 when compared to the other groups

TABLE 3: MARKS OBTAINED BY THE GROUPS AFTER COMPLETION OF PHASE II OF THE STUDY (GROUP B WAS EXPOSED TO THE BEDSIDE TEACHING)

Group	Marks Obtained (Mean±SE)
Group A	20.2±3.3
Group B	22.9±2.6*
Group C	14.7±3.5

*P<0.05when compared to group C while no difference when compared with group A

TABLE 4: SHOWING MARKS OBTAINED BY GROUPS AFTER COMPLETION OF PHASE III OF STUDY. (AFTER A GAP OF ONE MONTH FROM THE LAST ASSESSMENT)

Group	Marks Obtained (Mean±SE)
Group A	15.2±3.7
Group B	16.9±3.6
Group C	11.7±3.2*

*P<0.05 when compared to the other groups.

TABLE 5: RESPONSES SHOWN BY THE STUDENTS OF DIFFERENT GROUPS REGARDING THE FEEDBACK OF PHARMACOLOGY TEACHING AND THE PRESENT PROJECT

Question	Groups	Strongly Agree	Agree	Disagree	No comments
Current teaching of pharmacology emphasises the clinical application of medicines	Group A	2	4	10	4
	Group B	4	5	9	2
	Group C	1	3	15	1
Do you agree that pharmacology is boring and difficult	Group A	6	6	4	4
	Group B	8	8	2	2
	Group C	7	6	3	4
Cardiovascular pharmacology is most difficult among all chapters of pharmacology	Group A	9	2	4	5
	Group B	11	5	4	0
	Group C	12	4	2	2
Lectures are the best method for teaching pharmacology	Group A	13	3	4	0
	Group B	12	4	3	1
	Group C	11	6	3	0

In tutorial classes teacher does not explain in a proper way.	Group A	9	2	5	4
	Group B	6	7	2	5
	Group C	5	7	3	5
Pharmacology is very important subject for good doctor	Group A	16	3	1	0
	Group B	14	5	1	0
	Group C	11	6	2	1
Time spent during the practical classes is most often not utilized properly by the students and by the teachers	Group A	11	6	3	0
	Group B	12	5	3	0
	Group C	10	3	3	4
Going ward and learning medicine in ward is more beneficial for students	Group A	4	4	5	7
	Group B	3	4	3	10
	Group C	4	3	5	8
Students are more comfortable in asking questions during the tutorials than in the bedside teaching	Group A	5	7	6	2
	Group B	4	5	6	5
	Group C	5	5	6	4
This type of bed side teaching improves learning, memory of medicines	Group A	10	3	5	2
	Group B	11	4	5	0
	Group C	1	2	2	15

CONCLUSIONS AND DISCUSSION: The present study showed encouraging results in favor of bedside teaching of pharmacology. Lectures have their own importance and cannot be replaced but taking students to the ward and explain medicines there only makes students more inquisitive and enhances their learning and remembering skills. This also breaks the monotonous routine of students sitting in the tutorial or practical classes just to get their attendance [8-14]. Faculty also becomes more confident regarding subject. This study is a pilot study of its own kind. The study is in favor of better learning and remembering of pharmacology by students when they are exposed to the bedside along with lectures. Feedback from students was also encouraging. Most of the students were in the view to be exposed in wards simultaneously. However, according to few it was not acceptable. The reasons for this were phobia of handling medicines by themselves and shyness.

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