

An Integrated Approach of Teaching Pregnancy Induced Hypertension to MBBS Students

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Abstract

Introduction: The methodology of teaching is of three types. “Adhyapana” refers to “act of teaching” or the “teacher reads”. “Adhyayan” is “self-learning” or the “student reads”. “Sambhasa” or “Tatva vidya” refer to “discussion”. Types of learning are again of three types: informative learning, formative learning and transformative learning. Informative learning produces experts. Formative learning produces professionals. Transformative learning in the context of health education produces leaders with global connection. Millers pyramid of competence evolves the steps in learning as knows, knows how, does and teaches how. The aim of the vertical integrated teaching programme on pregnancy induced hypertension was to enable students to comprehend and teach (sambhasa) pregnancy induced hypertension with firm and reinforced understanding of pathophysiology, biochemical markers, radiological predictors, pharmacotherapy and anesthetic consideration. Neonatal problems specific to pregnancy-induced hypertension were also discussed.

Materials and Methods: This pre- and post-test study conducted in Kurnool Medical College, Kurnool, India on final year MBBS students for teaching ‘Pregnancy Induced Hypertension’ as a single day workshop with clinical case-based approach involving basic science experts. In six stations, twelve cases were discussed by a galaxy of experts from clinical and basic science departments. Pre-test and post-test results were analyzed. Feedback was taken from the students at the end of the day-long session and it was analyzed.

Results: Analysis of pre- and post-tests by questionnaires showed an increase in the scores of the students. This was plotted in a box plot. The feedback given by the student’s too preferred vertically integrated problem-based learning as a better method rather than didactic lectures and bedside teaching only.

Conclusion: This study shows a single one-day program of vertically integrated teaching of a common clinical condition broke the monotony of the curriculum and lead to an enjoyable learning experience to the final year medical students. Students expressed their preference towards more sessions of vertical integration programs in future through their valuable feedback. The efforts of all facilitators were acknowledged by the students and their improvement in scores in post-test motivated them in participating in these sessions in future. The application of their basic science knowledge into clinical problem-based approach of learning proved extremely useful in this study.

Key Words: Vertical Integration, Teaching, Medical Education

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I. Introduction

Vertical Integration is a new teaching method.¹ The basic sciences of anatomy, biochemistry, physiology is taught together with pathology of the disease. Pharmacology of the drugs used to treat the disease is discussed. Surgical and anesthetic considerations are explained. Finally the disease burdens in society and community implications are also high-lighted. Thus major social problems like hypertension can be discussed elaborately leading to reduced maternal deaths.

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problems specific to pregnancy-induced hypertension were also discussed.

There have been considerable advances in teaching.² However, maternal deaths as a direct and indirect result of hypertension in pregnancy remained to be high. Routine teaching methods have to be modified for those community needs that need immediate attention.

This study was designed to study the teaching methods and develop a strategy best suited for teaching hypertension in pregnancy in our institute.

Learning phases:

The learning in a medical profession can be classified as:

In the ***Preclinical learning*** basic science departments of anatomy, physiology and biochemistry the normal human body structure, function and biochemical balances are discussed. Having understood the normal mechanisms a medical student is taught about the etiopathology, signs and symptoms. Complications and sequelae of the various ailments affects mankind. The microbiological basis of disease is discussed. The administration, digestion, metabolism and excretion of each therapeutic drug are explained.

Clinical learning

Finally a medical student is given clinical cases where the patient with disease is interrogated for symptoms and examined for various signs. A list of investigations to be ordered need to be prepared. A disease process or a list of alternative disease processes has to be detected. The Treatment has to be outlined and patient prognosticated. A medical student is in a quandary of application of basic principles to therapeutic needs of his clinical cases. The amount of knowledge is enormous while the case basics and treatment options relatively less.

II. Materials And Methods

The study was conducted as a one-day teaching-learning program for final year students (200) 2016-17 batch of Kurnool Medical College, Kurnool this is a pre-test and post-test study thus a quasi-experimental study combined with a feedback study. The idea was to involve the students to the fullest and not to conduct this program for the students. The preparation was taken in a stepwise manner.

Step I/Preparation of Learning Module- Keep it Simple

A team of experts from the departments of anatomy, biochemistry, physiology, pathology, pharmacology, radiology, neonatal medicine, general medicine, obstetrics and anesthesia was briefed on the teaching principle of vertical integration.

Students were given the learning module in PDF format in web forum a fortnight before the actual clinical problems were given to them. The medical students were divided in groups to facilitate participatory group-based activity. The final module was discussed in 6 batches of 20 students together in the presence of a teaching faculty. On the day of the program students were asked to answer pre-test questionnaire.

Step 2/Case Based Discussion

Twelve case scenarios of pregnancy-induced hypertension were given for problem solving to the medical students. According to the barrow taxonomy of PBL methods the case scenarios were “full problem simulation” and “Student directed learning”. Students were divided into six groups. Each group of twenty students were given two cases for problem-based learning. A galaxy of experts from each department sat with students forming six stations.

Step 3/Plenary Session

Discussion- The cases were discussed with the experts of the disciplines integrated.

Step 4/Mind Mapping

The medical students of each group charted the concepts gained collectively. This was a participatory activity as the students of each group took one chart paper to outline their ideas. They signed their names below each chart. They were able to solve the clinical cases with the basic science preclinical knowledge with only a very little help from clinicians. Post-test was conducted. Feedback from the students were taken regarding the efficacy and usefulness of the program. The questions in the feedback form was adapted from pretested questionnaire used for another study for physiology module.

Statistical Analysis

Statistical analysis was done using the software SPSS version 21. Mean of Pre-test scores and Post-test scores for all the parameters were compared using Paired samples t-test. Cognitive gain was calculated as Post-test score minus Pre-test score. For all statistical evaluations, probability of value <0.05 was considered significant.

III. Results

Analysis of pre and post-tests by questionnaires showed an increase in the scores of the students. This was plotted in a box plot and significant difference is noted as in table 4. The feedback given by the student's too preferred vertically integrated problem-based learning as a better method rather than didactic lectures and bedside teaching only.

1. Epilepsy with pregnancy.
2. Pregnancy with oliguria with normal Placental growth factor.
3. Severe preeclampsia with HELLP syndrome.
4. Gestational hypertension progressing to severe preeclampsia.
5. Eclampsia at term
6. Severe preeclampsia with abruptio placentae in labour.
7. Severe preeclampsia with IUGR with prematurity with brain sparing effect.
8. Post-partum eclampsia.
9. Pregnancy at 24 weeks with uterine artery abnormal pulsatility index.
10. Severe preeclampsia at term with abnormal cerebroplacental ratio.
11. Epidural anaesthesia in severe preeclampsia with IUGR with reversed umbilical artery diastolic flow.
12. General anaesthesia in eclampsia.
Table 1. Cases Given to Students

Questions	Agree	Disagree	Uncertain
Teaching pregnancy induced hypertension concepts in integration with clinical scenarios is a better approach than the traditional teaching?	176	14	7
Integrated approach makes learning and understanding easy.	145	19	12
This mode of teaching and assessment motivated your critical thinking?	139	48	15
This mode of teaching would be helpful to you in the future years for better understanding of the clinical concepts?	149	16	21
Assessment of knowledge by the use of clinical scenario-based questions is a better way of judging the knowledge of the students?	157	12	18
Table 2 Questionnaire			

Questions	Agree	Disagree or Uncertain
Facilitators interacted with the students	156	46
Facilitators gave clear explanations and relevant information	167	42
I find the module interesting	165	15
Facilitator encouraged participation	154	14
Facilitator encouraged critical thinking	164	18
This integrated mode of teaching and assessment be continued in future? Module was well organized	149	16
Table 3 Questionnaire		

Pair	Mean	N	Std. Deviation	Std. Error of Mean
Pre-test	24.29	200	5.44	0.50
Post-test	34.51	200	6.13	0.56
Table 4. Paired Sample Statistics of Pre and Post test results				
p>0.05				

Pre-Test and Post-Test

A set of twenty multiple response multiple choice questions were used for pre-plenary assessment. The same questionnaire was given to students after the case based plenary session was over. The scores obtained were plotted using box charts for pre-test and post-test. The median, the 25th percentile, the 75th percentile and extreme values in pre-test and post-test group were plotted using sigma plot. An improvement of scores was observed in post-test compared to pre-test.

Feedback Analysis

83% of the students agreed that teaching basic concepts about pregnancy induced hypertension in integration with clinical case scenarios is a better approach than traditional teaching. 95% of the students

responded that integrated approach makes learning and understanding easy. 85% of the students agreed that this mode of teaching and assessment motivated their critical thinking. 91 % of the students hoped that this mode of teaching would be helpful to them in future clinical years Table 2.

The student's responses about the module organization and delivery are summarized in Table 3. 91% of the students agreed that the Module was well organized and 90% of the students found this module interesting.

IV. Discussion

The traditional method of teaching medicine implies that students should first learn basic and biomedical science subjects and then move to clinical science subjects following years; however, this is not how patients are presented. This approach is subjected to criticism as the medical students will not be able to appreciate the relevance of basic and biomedical sciences applied to clinical practice, and it is preferable to encourage students to think as doctors from the day they enter medical school.¹³ Participatory learning activities keep students alert and interested. A thorough knowledge of basic sciences is essential for patient dealing. The clinical skills need to be interweaved in the training matrix through a student centric approach. The medical students voted peer instruction and group discussion among themselves as the best learning method. Many students are displaced from family and friends for the first time in medical schools. Students fared better in post-test and they felt for complete understanding of the subject integrated teaching of basic concepts with clinical applicative learning is extremely useful. Similar results have been quoted by Brynhildsen J et al, feedback from their students and faculty showed that vertically integrated teaching methodology is better than the traditional teaching.¹⁴ In another study the students perceived that integrated teaching improves their performance in clinics when they face the clinical cases.¹⁵ This is in accordance with our results, 91% of our students think that integrated mode of teaching will be helpful to them in the future years for better understanding of the clinical concepts.

V. Conclusion

This study shows a single one-day program of vertically integrated teaching of a common clinical condition broke the monotony of the curriculum and lead to an enjoyable learning experience to the final year medical students. Students expressed their preference towards more sessions of vertical integration programs in future through their valuable feedback. The efforts of all facilitators were acknowledged by the students and their improvement in scores in post-test motivated them in participating in these sessions in future. The application of their basic science knowledge into clinical problem-based approach of learning proved extremely useful in this study.

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