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Review article

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Pharmacology Practical exercises for undergraduate in current scenario. An Educational forum

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ABSTRACT

Pharmacology is one of the most important subjects in medical curriculum. It is the basis of the medical science and the foundation of treatment. The applied aspects of pharmacology is the basis of clinical rational therapeutics. It has been generally felt that pharmacology course at undergraduate level in medical colleges has fails to keep pace with rapid changes and requirement of clinical practice. Traditionally, It has focused more on factual information with little emphasis on clinical and applied aspects. Pharmacy and experimental Pharmacology has remained the cornerstone of conventional practical exercises. The year 1997 was a turning point when MCI inculcate a rational and scientific basis of therapeutics. Subsequently we attempt practical exercises on drug related clinical problems with the restriction of animal experiments computer assisted learning (CAL) was also suggested to demonstrate the effect of drug on living tissue. We always wished to have a module of teaching like manikins and others i.e. CBME based that could take care of all the requirements at undergraduate level.

Keywords: Problem based learning, Pharmacoeconomics, Computer assisted learning, Prescription auditing

INTRODUCTION

The application of knowledge of pharmacology is an integral part in clinical practice. The primary aim of teaching pharmacology is to inculcate a rational and scientific basis of therapeutics in a medical graduate. Teaching of pharmacology is to develop intellectual, psychomotor, Attitude, communication skills and knowledge to enable therapeutic decision in clinical practice. Medical council of India given direction that undergraduate teaching should be clinical oriented [1,2].

Previously in Pharmacy practical we taught the students about preparation and dispensing of medicinal drugs in different dosage forms like ointment, mixtures, lotion, liniments, emulsion, powder, suspension, paint etc

In present scenario all those type of activities that we did in pharmacy Lab has no role because the drug that available

in market are ready to use as per the need of patient in different dosage form due to high growth in pharmaceutical industries in India. But Medical council of India has directed that at undergraduate level students must have some knowledge about preparation and dispensing of certain preparation (ORS, Carminative mixture, sulphur ointment and lotion)

Other part of pharmacology practical is Experimental Part. Previously we did experiments on small animals to see the effects of various stimulant and depressant drugs in Frogs heart (in-situ), Rabbits gut and effect of drug on rabbit eye. But in present time these experiments need large number of animals and killing of innocent animals shows not only cruelty but also unethical. Therefore there is need to develop some models of practical or exercises such as computer assisted learning (CAL) and Medical council of India also approves it to replace animal experimentation. But in

traditional animal experimentation student can see the effect of drugs on living tissue easy understanding, long retaining power and develop dissection skills. In our department because of limited resources we taught our students the effect of various drugs(effect of stimulant and depressant drugs on frog heart and rabbit gut) by showing lamellated tracings in small groups (10 students per group) and demonstrate the instrument & give them knowledge about the technique of experiment.

Medical council of India (2007) and later DGHS (2008) emphasize on the clinical aspect of pharmacology and insist the clinical implementation in practical classes [3]. One important part of undergraduate teaching is pharmacoeconomics in present scenario which would help them to choose the drugs based on their efficacy, safety, suitability and cost [4]. Prescription writing exercises tend to be desk work for common disease. Medical undergraduate should be trained in adverse drug reaction monitoring and reporting. Problem based learning (PBL) are also the part of MBBS teaching [5].

To fulfill all the criterias of MCI and present need we divide the whole Pharmacology practical exercises in three parts 1-Pharmacy, 2- Experimental 3-Clinical pharmacology. We try to keep the sentiments for the past traditional dispensing pharmacy and animal experimentations and need of the current situation i.e. CBME based curriculum which was implemented by MCI from the batch that entered from August 2019.

Pharmacy Exercises

- General introduction to pharmacy Lab and previous traditional practice in brief.
- Sources of drug information.
- Drug dosage formulation
- Pharmacopoeia
- Essential drug concept
- Schedule of drug
- Pharmacoeconomics
- Pharmacovigilance
- Pharmacoepidemiology
- TDM –Pk exercises
- Basic statistical knowledge
- Practicals (carminative mixtures, ORS, Sulphur ointment)
- Demonstration of different dosage form.
- Use of Inhaler, nebulizers
- Prescription writing
- Prescription auditing

Experimental Exercises

- Principals of good laboratory practice (GLP)
- Laboratory equipments.
- Demonstration of drug effect on frog heart (stimulant) by demonstrating tracings.

- Demonstration of drug effect on frog heart (depressant).
- Demonstration of drug effect on Rabbit gut(stimulant & depressant)
- Demonstration of topical drug effect on rabbit eye.
- Demonstration of Rota Rod Apparatus, Analgesiometer & Electroconvulsiometer.

Clinical Pharmacology

- 1- Drug dose calculation
- 2- Drug advertisement
- 3- Rational use of drugs, drug prescribing for specific conditions
- 4- Therapeutic problems
- 5- P drug
- 6- ADR Monitoring and Reporting
- 7- Dose calculation in Paediatrics patient
- 8- Setting of infusion Assembly
- 9- Drip/Drop rate calculation
- 10- Demonstration of insulin delivery device
- 11- Demonstration of inhalational drugs
- 12- Knowledge of clinical trial& drug development.
- 13- Informed consent taking
- 14- Problem based learning
- 15- Pharmacotherapeutic exercises
- 16- Fixed dose combinations
- 17- Dose response curve
- 18- Good clinical practices(GCP)

Communication skills

Group discussion

Project work

Models and charts

Assessment

- We assess the student by taking regular test and viva after completion of a particular topic in respective lab and finally lab leaving test and their marks are included in internal assessment.
- Assessment of practical manual on monthly basis
- Before appearing in the final professional we take the pre-university exam by conducting practical & viva just like the professional university exam to acclimatize the student for professional exam.

Final Assessment Exercise

1. Spotting exercises on various aspects – like instrument, Drug formulation, drug dosage forms, drug delivery system.
2. Prescription writing
3. Dose calculation
4. Clinical problem based exercise
5. Prescription audit

6. Drug interaction exercises
7. Stimulant/depressant drug effect on frog heart
8. Stimulant/Depressant drug effect on rabbit gut
9. Graphs on drug efficacy and potency
10. Dose Response curve exercise
11. Exercise on Pharmacoeconomics /cost benefit analysis of prescription.

CONCLUSION

Pharmacology teaching and learning must be based to optimize the future doctor to give their service to society that is cost effective and rationale. As we are always emotionally attached with our old tradition so keeping in mind the respect

of our old traditional part of teaching. We try to form our pharmacology practical part as per the need of present and future but during the clinical posting main emphasis is on teaching the diagnostic reasoning of disease rather than therapeutic reasoning and prescribing, so there is necessity for clinical pharmacology to be taught along with other clinical subjects. In addition of teaching pharmacology in 2nd Professional there is a need to include the teaching of clinical pharmacology in final professional to develop cost effective rationale prescribing and therapeutic skill in the student .All these things MCI included in CBME based curriculum and we will make our pharmacology practical exercises to include old traditional part, what I do at present and recent CBME base curriculum at undergraduate level.

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