EXERCISE ON PRESCRIPTION AUDIT : A TOOL FOR PHARMACOLOGY PRACTICAL LESSON

Supreeti Biswas [1]*, Kanchan Kumar Mondal [2], Indranil Banerjee [3],
Swati Bhattacharyya [4], Anjan Adhikari [5], Tapas Kumar Bhattacharyya [6]

ABSTRACT: To improve the understanding and perception about rational prescribing among the Undergraduate (UG) students, a record based study 'exercise on prescription audit' was undertaken as self-directed learning strategy. Study was conducted on Objectively Structured Evaluation of pharmacotherapy taking one year record of prescriptions in Bed Head Tickets (BHTs) of discharged Ophthalmic in-patients. Standard format for prescription writing, WHO guide to Good prescribing and Essential Medicines were followed to assess the in-patient prescriptions. Students improved markedly (p< 0.001) in audit of real prescriptions. Results revealed that 37 types of drugs were prescribed over 948 BHTs. Completeness of the prescription showed 100% perfection in maximum indicators with exception in judicious investigations (99.89%), medication information (89.32%) and relevant advices for patient (97.12%). Subsidary or symptomatic drugs (56.76%) were prescribed more than the core drugs (43.24% of total drugs prescribed). Generic prescription was 54.05%. Study in turn improved the understanding and perception about rational prescribing among the students. The students gained knowledge about the utilization of different types of dosage forms of drugs. Prescription audit as self-directed learning must be a tool for practical lesson of Pharmacology for UG-course as well as for PG-curriculum.

Key words: Core drugs, Self-directed learning, Rational prescription.

[1] *Professor & Head, Department of Pharmacology, Burdwan Medical College, Burdwan-713104, West Bengal, India.*

[2] *Associate Professor, Department of Ophthalmology, R. G. Kar Medical College, Kolkata - 700004, West Bengal, India.*

[3] *Assistant Professor, Department of Clinical and Experimental Pharmacology, Calcutta School of Tropical Medicine, Kolkata - 700073, West Bengal, India.*

[4] *Assistant Professor, Department of Pharmacology, Burdwan Medical College, Burdwan - 713104, West Bengal, India.*

[5] *Assistant Professor, Department of Pharmacology, R.G. Kar Medical College, Kolkata- 700004, West Bengal, India.*

[6] *Professor & Head, Department of Pharmacology, Calcutta National Medical College, Kolkata - 700014, West Bengal, India.*

* Corresponding author.

INTRODUCTION

Prescription audit is the process of examining clinical practice, a pharmaco-epidemiological survey which determines knowledge, attitude and behaviors of prescribers. It aims towards identifying inappropriate prescribing practice where improvements can be made. It also may be utilization oriented aiming to improve the quality of drug therapy through pedagogic (educational) intervention. Rational use of medicine is the essential element in achieving quality health care for patients and the community. Patients' health may be influenced by prescribing appropriate medicines in appropriate way for a disease (WHO 2003, Ross-Degnan *et al.* 1992, Maxwell and Walley 2003). Essential skills for judicious prescription writing can be achieved through Pharmacology courses. Pharmacology training has been concentrated more on theory ('drug-centred') than on practical aspects of prescribing. (de Vries *et al.* 1995). Traditional pharmacology teaching does not adequately prepare the student for rational practice. It is imperative to train students for self-directed learning. Hence, aiming to improve the understanding and perception about rational prescribing among the future prescribers, a study 'exercise on prescription audit' was contemplated as a teaching-learning strategy for undergraduate (UG) students.

Objectives of the study

1. To use prescription audit as a tool for practical lesson of Pharmacology aiming self-directed learning.

2. To utilise inputs from prescription audit for good rational prescribing by feedback to prescribers.

3. To make students acquainted with the principles of rational prescription writing.

4. To attain skills in assessment, analysis and evaluation of prescription towards rationality.

MATERIALS AND METHODS

Medical education oriented a record based study was carried out among 150 UG students studying Pharmacology of 2nd Professional MBBS course of R.G. Kar Medical College, Kolkata. Approval to conduct the study was obtained from Institutional Ethics Committee. Study duration was 6 months and exercised during Pharmacology practical hours. Preparatory groundwork was done in the Department of Pharmacology. Students were trained up on prescription audit by interactive teaching sessions on rational prescription writing, drug use indicators, essential drug concept, rational use of drugs, evidence-based medicine, and P-drug selection (de Vris *et al.* 1995, Buxton *et al.* 2006, Holloway and Green 2003, WHO 2007). They were trained up in 2 hours per batch of 25 students each. Repetition of training was done when required. Initially before recruitment in the study they individually had to audit 10 dummy prescriptions made by the Pharmacology Department. Dummy prescriptions were generated as per standard prescription format omitting or distorting some component parts of the false prescriptions. After that they were introduce in the real prescription audit. Students were scored on prescription audit of both dummy and real prescriptions with a 10 points scoring system. Performance of each student was assessed through Objectively Structured Evaluation (OSE) on pharmacotherapy that whether they properly studied or audited the

following 10 points regarding prescription writing or not. 1. Prescribers' information, 2. Patients' information, 3. Date of prescription issued, 4. Diagnosis for pharmacotherapy, 5. Judicious investigations prescribed / done, 6. Medication information, 7. Generic prescription, 8. Direction for use & refill information, 9. Prescriber's signature, 10. Rationality of prescription. Faculty members assessed prescription audit of each student using a check list. How many students audited each of 10 points on both dummy and real prescriptions was calculated and expressed in percentage. Results obtained were statistically analyzed using chi-square test. P value <0.05 was considered statistically significant.

Study material was the prescriptions in Bed Head Tickets (BHTs) of discharged Ophthalmic-in-patients. The BHTs were available in Medical Record Section (MRS). Permission to handle the BHTs was obtained from the Departments of Ophthalmology and MRS. Screening of the latest continuous records of BHTs for one year, April 2007 to March 2008 was carried out by the students in the MRS. Information related to prescribers, patients and the prescribed drugs from those BHTs were copied in a predesigned proforma, Case Report Form, as appended in Annexure-I. Collected data were compiled, evaluated and analyzed in the Department of Pharmacology. Standard format for prescription writing (Buxton 2006) and WHO guide to Good prescribing (de Vris *et al.* 1995) were followed for selection of study parameters to assess the in-patient prescriptions. Prescriptions were studied to observe whether they conform to following parameters - 1. Completeness of different component parts of prescription, 2. Prescription for judicious investigations, 3. Relevant advices or instructions for patients corroborating therapeutic indication, 4. Generic prescription. Obtained data were analyzed by descriptive statistics using Statistical Package for Social Sciences (SPSS 16.0) and Microsoft Excel.

RESULTS AND DISCUSSION

Score of the UG students on audited dummy and real prescriptions following 10 points was depicted in Table 1. Students improved markedly (p< 0.001) in audit of real prescriptions. Of one year records of MRS, 948 BHTs (prescriptions) were screened out as Ophthalmic-in-patient cases. Result revealed different types of ophthalmic cases admitted in indoor wards, majority (97.36%) of which was comprised of surgical cases. Table 2 is displaying the results of prescription audit. In all encounters completeness of the prescriptions showed cent percent perfection in maximum indicators with exception in judicious investigations (99.89%), medical information (89.32%) and relevant advices for patient (97.12%). Total 37 types of drugs were prescribed over 948 prescriptions (BHTs). Subsidiary or symptomatic drugs (56.76%) were prescribed more than the core drugs (43.24% of total drugs prescribed). Hospital supplied drugs were prescribed in generic name which was 54.05%. Different types of dosage form were utilized as topical (eye drops & ointment), gel (lignocaine), oral (tablet, capsule & syrup) and injections (i.m / i.v). Strength of the preparations was mentioned in 68.98% of cases. Prescriptions were almost rational.

Present study was a record based medical educational performance which resulted in a report of exercise on prescription audit given

Table 1 : Performance on 10 points OSE in prescription audit by students (N = 150)

Serial No.	Indicators of 10 points Objectively Structured Evaluation (OSE)	(No.) Percentage of students. Prescriptions		p value (NS= Not Significant)
		Dummy	Real	
1.	Prescribers' information	(150) 100	(150) 100	NS
2.	Patients' information	(84) 56	(123) 84	<0.001
3.	Date of prescription issued	(135) 90	(150) 100	<0.05
4.	Diagnosis for pharmacotherapy	(132) 88	(150) 100	<0.01
5.	Judicious investigations prescribed / done	(44) 29.33	(99) 66	<0.001
6.	Medication information	(144) 96	(100) 100	<0.05
7.	Generic prescription	(60) 40	(107) 71.33	<0.001
8.	Direction for use & refill information	(117) 78	(147) 98	<0.01
9.	Prescriber's signature	(148) 98.67	(150) 100	NS
10.	Rationality of prescription	(31) 20.67	(129) 86	<0.001

to the UG students studying pharmacology. This exercise was an attempt to educate the students about the methods and skills required to gain knowledge on 'how to prescribe a drug' and 'what information they should provide to their patients'.(de Vris *et al.* 1995). A selected subject (Ophthalmology) was integrated for this purpose because near all types of dosage forms are utilized by the Ophthalmologists. A simple consultation of only an hour does not prepare a student to evaluate prescriptions and to gain knowledge on rational prescribing. Instead, students, the future prescribers, should build their clinical practice on the core principles of rational prescription inculcating prescription audit, a quite complex process of professional analysis. Prescription audit was undertaken as self-directed learning for

practical lesson in the present study. Prescriptions were audited in respect of completeness of prescription writing, prescribing behaviors and rationality. No attempt has been made to categorize the prescriptions according to patient's age, sex or disease profile.

Result of this prescription audit indicated under-prescription in few indicators with good prescription otherwise, which was in contrast with other studies (Benzamin 2003, Sequeira *et al*. 2004, Rauniar *et al*. 2008, Rahman *et al.* 2009). Prescriptions were provided with proper instructions regarding drug dosing and duration. It contained other relevant advices for drug use and follow ups of the patients. Core drugs indicate minimum medicines required for a basic health care system, which are most

Table 2 : Results of the audit of real prescriptions (N = 948).

Serial No.	Indicators of prescription audit	Percentage
1.	Prescribers' information	100 %
2.	Patients' information	100 %
3.	Date of prescription issued	100 %
4.	Diagnosis for pharmacotherapy	100 %
5.	Judicious investigations	99.89 %
6.	Medication information	89.32 %
	(Name 100%, dosage form 100%, strength 68.98%)	
7.	Direction for use & refill information	100 %
8.	Relevant advices for patient	97.12 %
9.	Prescriber's signature	100 %
10.	No. of total drugs prescribed over 948 prescriptions	37 (n)
	Prescribing behavior for prescribed total drugs	(n = 37)
1.	Prescribed core drugs	43.24 %
2.	Subsidiary or symptomatic drugs	56.76 %
3.	Generic prescription	54.05 %

efficacious, safe and cost-effective medicines for priority conditions (WHO 2007). In the current study core drugs were utilized properly, but symptomatic drugs superseded it. It needs improvement regarding some particular parameters like generic prescribing, polypharmacy, relevant advices for patient and medication information. By convention prescription audit was followed by feedbacks to prescribers (Ophthalmologists). Current study in turn was expected to improve the understanding and perception about rational prescribing among the future prescribers. At the end of the exercise students could understand the principles of rational prescribing in order to assess the quality of the prescription. They were enabled to analyze the prescribing pattern. They also acquired knowledge about the departmental

(Ophthalmology) practiced treatment guidelines. The students embraced record-based prescription audit as learning process. They liked practical sessions on assessing rationality of prescriptions and evaluation of drugs rather than didactic lectures on prescription writing.

Knowledge, understanding, skill and attitude are required to prescribe drugs correctly, effectively and safely by medical graduates (budding doctors). The 'transferable skills' can be achieved through Pharmacology courses (Aronson 2006, Shanker *et al.* 2003, Gitanjali and Shashindran 2006). Clinical pharmacology courses have already been introduced in some medical institutions.(Tofivic *et al.* 1998, Flockhart *et al.* 2002). Hence, we aim to continue and strengthen the practical lesson by including prescription audit in the UG-curriculum of pharmacology (2nd Professional MBBS course). It may provide an insight into prescription writing skill and strength to be efficient.

Limitations : This study was confined to only one Department, even only to indoor prescriptions. It might have been better if multidisciplinary prescriptions for both indoor and outdoor patients could be inculcated. Students could be able to realize the drug utilization pattern in different clinical situations and to interpret the intent of multidisciplinary prescriptions. Another area of limitation of this study was the lack of cost analysis. Students could find out how much rational was the prescriptions in respect of cost-effectiveness.

CONCLUSION

The study in turn improved the understanding and perception about rational prescribing among the UGs. They gained knowledge and idea about the utilization of different types of dosage forms of drugs prescribed by Ophthalmologists. Prescription audit as self-directed learning and transferable skills must be a tool for practical lesson of Pharmacology for UG course. It also should be included in Postgraduate curriculum. A vigorous training on prescription audit is required for medical students as well as all medical specialists.

REFERENCES

Aronson JK.(2006). A prescription for better prescribing. *Br. J. Clin. Pharmacol.* 61(5): 487.

Benzamin DM.(2003). Reducing medication errors and increasing patient safety. Care studies in clinical Pharmacology. *J. Clin. Pharmacol.* 43: 768-783.

Buxton ILO.(2006). Principles of prescription order writing and patient compliance. In: Brunton LL, Lazo JS, Parker KL, editors. Goodman and Gilman's. The Pharmacological Basis of Therapeutics. 11th edn. McGraw-Hill. New York. p.1777 - 1786.

de Vries TPGM, Henning RH, Hogerzeil HV and Fhresle DA.(1995). Guide to Good Prescribing (A practical manual). World Health Organization Action Programme on Essential Drugs. Geneva. WHO/DAP/94.11.

Flockhart DA, Usdin Yasuda S, Pezzulio JC and Knollmann BC.(2002). Teaching rational prescribing: a new clinical pharmacology curriculum for medical schools. *Naunyn-Schmiedeberg's Arch. Pharmacol.* 366: 33-45.

Gitanjali B and Shashindran CH.(2006). Curriculum in clinical pharmacology for medical undergraduates of India. *Indian J. Pharmacol.* 38 (Suppl. 2) : 108-114.

Holloway K (Editor) and Green T.(2003). Drugs and Therapeutics Committees- A Practical Guide. WHO. Geneva. Switzerland. WHO/EDM/PAR/2004.1

Maxwell S and Walley T.(2003). Teaching safe and effective prescribing in UK Medical schools : a core curriculum for tomorrow's doctors. *Br.J.Clin.Pharmacol.* 55:4 96-503.

Rahman Z, Nazneen R and Begum M.(2009). Evaluation of prescribing pattern of the private practitioners by the undergraduate medical students. *Bangladesh J. Pharmacol.* 4(1): 73-75.

Rauniar GP, Roy RK, Das BP, Bhandari G and Bhattacharya SK.(2008). Prescription Writing Skills of Pre-clinical Medical and Dental Undergraduate Students. *J. Nepal Med. Asso.* 47(172): 197-200.

Ross-Degnan D, Laing R, Quick J, Ali HM, Ofori-Adeji D, Salako L and Santosa BA.(1992). Strategy for promoting improved pharmaceutical use: The international network for rational use of drugs. *Soc.Sci.Med.* 35: 1329-41. Available from http://dx.doi.org/ 10.1016/ 0277-9536(92)90037-Q.

Sequeira RP, Ansari TM and Khaja KAJ.(2004). Prescription errors in primary care: types, determinants and therapeutic implication. *Drug Saf.* 26: 959.

Shankar PR, Mishra P, Shenoy N and Partha P. (2003). Importance of transferable skills in pharmacology. *Pharm. Edu.* 3(2): 97- 101. Available from http://dx.doi.org/ 10.1080/1560221031000089507.

Tofivic SP, Branch RA, Jackson EK, Cressman MD and Kost CK Jr.(1998). Teaching clinical pharmacology and therapeutics: selective for fourth-year medical students. *J. Clin. Pharmacol.* 38: 670-679.

WHO(2003). Introduction to Drug Utilization Research. Geneva. Switzerland. p. 6 - 48.

WHO(2007). Model list of essential medicines. 15th edn. p. 1 - 27. Available from www.who.int/medicines/08_ENGLISH_ indexFINAL_EML15.pdf

ANNEXURE - I :   CASE REPORT FORM

No.   Date of collection :

Prescribers' information :

Patients' information :

Name :   Age :   Sex :   Religion :

Address with P.S :

Date & Day of Admission :   Registration No.

Diagnosis :   Date of   Discharge :

Investigations ;- BP :   Tn. :   PPBS :   V/A: Microbiological: Others:

Surgical Cases :-   Date of Surgery :   Type of Surgery done :

Anaesthesia : GA / LA

Drugs prescribed : Medical Cases. /   Surgical Cases : 1. Pre-operative, 2. Per operative,

 Date :   3. Post-operative

Drugs' Name	Dosage form Strength	Dose, Route of administration	Frequency	Duration

Sig. of Data Collector (Student)   Sig. of Investigator (teacher)