

Research Article



COMPARATIVE STUDY OF PRESCRIBING PATTERNS OF DOCTORS OF TEACHING HOSPITAL AND PRIVATE PRACTITIONERS IN A CITY OF CENTRAL INDIA

Dr. Ashutosh Chourishi¹, Dr. Rekha Vimal Gupta², Dr. Anshul Jhanwar³, Dr. Sanjay Gedam³, Dr. Swati Chourishi⁴

¹ M.D. Associate Prof, Dept. of Pharmacology, R.D. Gardi Medical College, Ujjain, India.

² M.D. Associate Prof, Dept. of Obstetrics & Gynecology, R.D. Gardi Medical College, Ujjain, India.

³ P.G. Student, Dept. of Pharmacology, R.D. Gardi Medical College, Ujjain, India.

⁴ Demonstrator, Dept. of Dentistry, R.D. Gardi Medical College, Ujjain, India.

*Corresponding author's E-mail: dr_chourishi@yahoo.co.in

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ABSTRACT

Writing a prescription is a vital part of the process of rational therapeutics; a badly written prescription could undermine a clinical consultation. To compare various aspects of prescribing patterns of doctors of teaching hospital and private practitioners. Prescription audit was conducted for a period of 3 months for out patient departments (OPDs) in teaching hospital and retail medical shops in Ujjain district. Patients consent was taken and their respective prescriptions were copied, the data was collected on random basis and comparisons were done under following basis: (a) whether the prescriptions were legible and the format of prescriptions was well defined. (b) Whether rational drugs were prescribed (c) Whether they were prescribing drugs by generic name from essential medicines list (d) Different categories of drugs were used in prescriptions. Private practitioners were writing about two times more illegible prescriptions than teaching doctors i.e. 24% vs 12%. All prescriptions of PPs were followed polypharmacy whereas 87.64% of TDs prescriptions were followed polypharmacy. Among the total drugs prescribed in different categories by TDs and PPs, about 35% were prescribed from two major groups (NSAIDs and Antimicrobials). Average number of drugs prescribe per prescription were more by PPs than TDs (4.32 vs 3.14). TDs were prescribing much more generic drugs (71.31% vs 4.17%), essential medicines (68.72% vs 36.85%) in comparison to PPs. Prescriptions lacked details and some were not clearly legible in both group. The adherence to the typical format of prescription was more common with the prescriptions of PPs than TDs but deficiencies were observed in both prescriptions. The prescriptions of TDs were more rational and cost effective than PPs. The scopes of improvement of prescribing behaviors widely exist for not only to private practitioners but also to teaching doctors. An urgent intervention is needed to ensure that patients are able to get rational and cost effective therapy.

Keywords: Prescription writing, teaching hospital, private practitioners, rational use of drug.

INTRODUCTION

The interaction between a doctor and patient usually culminates in the writing of a prescription order. The energies, skills and time put into making a diagnosis and formulating appropriate therapy could be wasted if adequate attention was not given to the details that ought to be included in a well-written prescription. A prescription order should clearly communicate with a pharmacist/dispenser what therapy a particular patient is to get: how much of a specific medicine should be taken, how often and for how long. It should also clearly identify the prescriber, be signed in ink, and be dated.¹ The illegibility of the prescription or omission of any of these details in a prescription order could result in misinterpretation and medication errors.²

A prescription order is a written instruction of doctors to pharmacist to supply drugs in particular form to a patient and the directions to the patients regarding the use of medicines. It is important therapeutic transaction between the clinician and the patient.³ Medicines should be used only when essential but in practice, they are used too readily. Irrational prescription is a common occurrence throughout the world,⁴ it is seen everywhere (in teaching and non teaching institution) at all level (senior and juniors) in all categories (family physicians,

specialists, and super specialist). WHO has defined "Rational use of drugs requires that patients receive medication appropriate to their clinical needs, in doses that meet their own individual requirements for an adequate period of time, at the lowest cost to them and their community."⁵

According to planning commission paper of 2009, health care expenses were responsible over half of all cases decline into poverty. It is more when we are considering non government sector. It indicates huge impact of rising price on health expenditure. This expenditure can be minimized by prescribing drugs by generic name and selection of drugs from essential medicine list. Generic drugs are substitute of branded drug without any patent protections with similar efficacy but 40 to 60 percent cheaper than branded drugs.⁶ Ideally doctors should bind to prescribed affordable and essential medicines to their patients however they are blamed to write costly branded medicines. WHO has defined "Essential medicines are those that satisfy the priority health care needs of the population".⁷ To cut down the cost of routine medical expenses, centre and certain state governments are going to open or have opened several Jan Aushadhi units. The government doctors of some state have been already instructed to use generic names of the medicines.



This motivated us to do comparative study of prescribing behaviors of doctors of teaching hospital (TDs) and private practitioners (PP) in a district of Madhya Pradesh (India). Most probably, this type of comparative study was first of its kind in central India.

The aims of our study were to compare the prescribing pattern adopted by doctors working in two different conditions; our study was carried out at following levels:

- (i) Whether the prescriptions were clearly written.
- (ii) Whether the format of prescriptions were well defined.
- (iii) Whether drugs prescribed were rational.
- (iv) Whether medicines were selected from essential medicine lists
- (v) Whether drugs were written by generic or brand name.

MATERIALS AND METHODS

Comparative cross sectional study was carried out for a period of 3 month in two different set up in Ujjain city, M.P. India, one was doctors of teaching hospital (R. D. Gardi Medical College, Ujjain) and another was private practitioners in Ujjain district.

1. Mode of collection of prescriptions for teaching doctors

A patient based prescription audit was done using cross sectional study design for a period of 3 months (June 2011 to Aug 2011) on various outpatient departments (OPDs) of R.D. Gardi Medical College, Ujjain, MP. Patient consent was taken after explaining purpose of the study and their respective prescription was copied using digital camera, the data was collected on random basis to minimize bias. Six hundred fourteen (614) prescriptions were collected from teaching hospital for Teaching doctors (TDs).

2. Mode of collection of prescriptions for private practitioners

A cross section study during the same period was done, prescriptions were collected during same period from patients at six retail medical shops located at least five kilometers away from teaching hospital and investigator had copied prescriptions by digital camera after taking consent of patient. Those patients who had not given consent to copy their prescriptions by digital camera, there prescription were directly noted on WHO prescribing indicator form. Four hundred thirty two prescriptions (432) were collected from retail shops of medicine for evaluation of prescriptions for private practitioners (PPs).

All prescriptions (1046) were studied to examine whether they conform following parameters of a typical prescription.

(A) Evaluation on clarity of prescription was made by following four points:

- All aspects of prescription were very clear to read.
- All aspects of prescription were clear but efforts required to read it.
- Any one aspect (e.g. name of drug/dose/duration) not clearly written.
- At least one aspect of prescription was partially unclear.

(B) Format of prescription:⁸

(a) Superscription: It includes the date on which prescriptions order were written; the name, address, weight, age of the patient; and the "Rx", an abbreviation for the Latin word *recipere* meaning "take" or "take thus", as a direction to a pharmacist, preceding the physician's "recipe" for preparing a medication. This sign is deemed to be an invocation to Jupiter, the Roman God of healing and its appearance on the prescription is purely symbolic and traditional.

(b) Inscription: It is the body of prescription containing the name and amount or strength of each ingredient to be compounded.

(c) Subscription; It is the direction to the pharmacist, usually consisting of a short sentence like make a solution, mix, dispense 100ml, dispense with oral syringe and dispense 20 capsules or tablet.

(d) Signa or "Sig": It is the instruction for the patient as to how to take the medicines written in prescriptions.

(e) Prescriber's identity: It includes name, address, qualifications and MCI reg. which were generally written at the top of prescriptions and signed at end of prescriptions.

(C) Assessment of rational use of drugs:

The content of prescription was assessed and evaluation was done on the basis of W.H.O guide to Good prescribing, a practical manual.

(D) Conformity of prescribed drugs from essential medicines list:

It is done with the National List of Essential Medicines of India 2011.⁹

(E) Evaluation of prescription on prescribing indicator form of WHO:

These were estimation of total number of drugs used; total number of combinations used, most commonly used drugs and percentage of injectable preparation in prescription. Descriptive statistics were used to analyzed the result of study.

RESULTS

During the study period, one thousand forty six (1046) prescriptions were collected. Out of these prescriptions 614 of TDs and 432 of PPs. The findings pertaining to the layout and content of the prescription are shown in table



1. It was found that all prescriptions of both doctors of teaching hospital and private practitioner were duly dated along with patient name and age however complete address of patients were completely missing in all prescriptions.

Weight was mentioned in 82% of patients of prescriptions of TDs but in PPs group it was only mentioned in 56.3%. Majority (92%) of prescriptions contain details of dosage form along with route of administration with their name, however details of dose and frequency was absent or not clear in 13 percent of total drugs prescribed for TDs. Drugs name along with dosage form, route of drug administration and dose frequency were mention in about 73% prescriptions of PPs. A clear instruction to the pharmacist was missing in nearly one third prescription of PPs whereas majorities (91%) of TDs provide this information (table 1). In 36% of prescription instruction to the patient was given by TDs whereas incomplete instructions were written in majority of prescriptions of PPs. All prescriptions were signed by prescriber, but it lacks prescriber's identity of TDs. Identity of private practitioners were clearly mentioned, the writing prescriptions in personal letter head with printed identity (name of practitioner, qualification, address and contact detail) on it and sign was found missing in very few prescriptions as shown in table 1. A similar pattern for legibility of prescription was found in TDs and PPs (table 1).

Table 1: Layout of Prescription and its Legibility

	Prescriptions of TDs	Prescriptions of PPs
(a) Content of prescriptions		
Superscription		
Date on prescriptions	100%	100%
Name of patient	100%	100%
Sex	88%	62%
Age of patient	100%	100%
Weight of patient	82%	56.3%
Rx	100%	87% (Advice 13.55% in place of Rx)
Inscription		
Dosage form and drugs name	92%	72.86%
Dose, duration and frequency of drugs Administration	87%	72.86%
Subscription		
Instruction to pharmacist	91%	76%
Signa		
Complete instruction to patient	36%	9%
Signature of prescriber	100%	98%
Prescribers' identity	0%	100% (Printed personal letter head is used)
(b) Legibility (clarity in handwriting) of Prescriptions		
Can be read whole prescription	88%	76%
At least one aspects unable to read	12%	24%

Six hundred fourteen prescriptions had 1931 drugs of teaching doctors and Four hundred thirty two

prescriptions had 1867 drugs of Private Practitioners. All prescriptions were evaluated for average drug per prescription. It was found that the private practitioners (PPs) prescribed in average (4.32) more drugs as compared to the TDs (3.14) (table 2).

Table 2: Analysis of prescription

	Prescriptions of TDs	Prescriptions of PPs
Number of prescription	614	432
Number of drugs Prescribed	1931	1867
Number of drugs prescribed per prescription	3.14	4.32
Number of drugs prescribed by generic name	1377 (71.31%)	78 (4.17%)
Number of essential drugs from essential medicine list	1327 (68.72%)	688 (36.85%)
Number of drugs combination prescribed	307 (15.90%)	612 (32.78%)
Drugs combination from essential medicine list	125 (40.72%)	102 (16.67%)
Number of injectable prescribed	57 (2.95%)	122 (6.53%)

It was revealed that all prescriptions of PPs contain more than one drug per prescriptions whereas nearly 13% of prescriptions of TDs contain only one drug. About nine percent (8.79%) prescriptions of TDs contain at least five drugs per prescription as compared to 25% of prescriptions of PPs. Maximum seven and nine drugs were prescribed by TDs and PPs respectively but there frequencies were very less (table 3).

Table 3: Number of drugs per prescription

Number of drugs per prescription	Number of prescriptions of TDs (%) n = 614	Number of prescriptions of PPs (%) n = 432
1	82 (13.36%)	0
2	128 (20.85%)	51 (11.81%)
3	166 (27%)	88 (20.37%)
4	143 (23.29%)	97 (22.45%)
5	54 (8.79%)	108 (25%)
6	35 (5.7%)	49 (11.34%)
7	05 (0.81%)	33 (7.64%)
8	01 (0.16%)	5 (1.15%)
9	0	1 (0.23%)

In TDs number of drugs prescribed by generic name were found 1377 (71.31%) and number of essential drugs from essential medicine list were found in 1327 prescriptions (68.72%) (table 2). There was marked difference in comparison to prescription of PPs in which generic drugs are very few 78 (4.17%). Essential medicines were also prescribed less 688 (36.85%) than that of TDs. Injections were prescribed more (6.53%) by PPs than TDs which were 2.95% (table 2). Three hundred seven and six hundred twelve drug combinations were prescribed by TDs and PPs respectively, among them 125 (40.72%) in TDs and 102 (16.67%) in PPs were from standard drug combinations listed by W.H.O (table 2).

Among the total drugs prescribed in different categories by TDs, more than thirty four percent (670 out of 1931) were prescribed from two major groups (NSAIDs 18.7%, Antimicrobials 16%) as shown in table 4 followed by CVS



drugs / antihypertensive 274 (14.2%), H2 blocker/antacid 188 (9.7%), Antihistaminic/and for cough preparations 180 (9.3), Vitamins/minerals 166 (8.6%), Antipsychotic/drugs for CNS disorder 116 (6%) has shown in table 4. There were certain variations in different categories of drug prescribed by PPs, except first two major groups i.e. NSAIDs (19.13%) and Antimicrobials (16.41%) drugs were used similarly around 36%. Other more commonly prescribed groups were Vitamins/minerals 15.64%, H2 blocker/antacid 8.42%, Antihistaminic/and for cough preparation 8.16% (table - 4). Synthetic penicillin and cotrimaxazole were commonly used antimicrobials by TDs, but different generation of cephalosporins and microlides were more prescribed by PPs than TDs. Quinolones were preferred antimicrobial by both sectors of doctors. Paracetamol and Ibuprofen were preferred NSAIDs by TDs and PPs respectively. 8.6% Multivitamins and minerals (in which iron preparation were more than three percent) prescribed to the patients by TDs compared to 15.64% prescribed by PPs. None of the prescriptions of both sectors contained drug banned by drug controller of India.

Table 4: Different categories of drugs prescribed

	Prescriptions of TDs	Prescriptions of PPs
NSAIDs	361 (18.7%)	357 (19.13%)
Antimicrobials	309 (16%)	306 (16.41%)
Vitamins/ Minerals	166 (8.60%)	292 (15.64%)
H2blockers/ antacid	188 (9.7%)	157 (8.42%)
CVS drugs/Antihypertensive	274 (14.2%)	73 (3.91%)
Antipsychotics/ drugs for CNS disorder	116 (6%)	29 (1.53%)
Antihistaminic and drugs for cough preparation	180 (9.3%)	152 (8.16%)
Antidiabetics	61 (3.15)	51 (2.72%)
Steroids	49 (2.52)	73 (3.91%)
Non allopathic Medicines	09 (0.47)	37 (1.96%)
Others	218 (11.28)	340 (18.20%)

Rationality of prescription was assessed by W.H.O guide to good prescribing, a practical manual. Diagnosis or provisional diagnosis was not written in 22.8% (140) and 26.74% (115) of prescriptions TDs and PPs respectively. Written instructions were not given by clinician to patients in both scenarios. So we had equated verbal instructions to that of written instructions during assessment of rationality although it causes bias. Over prescribing of drugs and polypharmacy was very common in PPs, although it is also found in some prescription of TDs. Some examples are for diarrhea where oral rehydration solution is sufficient inspite that many doctors had prescribed an irrational combinations ofloxacin and ornidazole. Similarly viral fever can be treated simply with rest, healthy nutrition and paracetamol but clinician had prescribed bacterial antibiotics also, and malaria was treated with antibiotics, antimalarial and combination of NSAIDs. These were few examples but in reality around 50% of all prescriptions such misuse of drugs were seen. NSAIDs or its

combinations were unnecessarily used in many prescriptions.

All authors had evaluated each prescription on the basis of W.H.O guide to good prescribing for rationality, a practical manual. We had concluded that irrationality in prescribing drugs was close to forty percent (37%) by TDs and about 52% by PPs. In other words, more than sixty percent (63%) of TDs and 48% of PPs prescriptions were appropriate in terms of efficacy, safety, suitability and cost effectiveness which were evaluated on the basis of W.H.O guide to good prescribing, a practical manual.

DISCUSSION

Our study revealed that handwriting was illegible in one fourth of prescriptions. The illegibility (unclear handwriting) of prescriptions could result in misinterpretation and mistakes.² Unclear prescriptions result in over 150 millions calls from pharmacist to physicians in the united state annually.¹⁰

Prescriber identification was not found in prescription of TDs, this may lead to serious problems if there were need to verify the origin of prescription or to clarify any aspects of it. So at least personal stamp bearing prescribers' identity (name, registration number, post) can be cheap and easy useful intervention to improve the quality of prescription.¹¹ Deficiency in details required for patient and prescriber identifications had also been reported in other studies also.^{12,13}

Three parameter of superscription i.e. name and age along with date on which prescriptions were written, mentioned in all of the prescriptions irrespective to teaching doctors or private practitioners. Sex was more mentioned in prescriptions of TDs than prescriptions of PPs. Again weight which is important parameter to decide dose of drug to pediatric patients was written only about 82% of TDs and 56 % of PPs prescriptions. A change in prescription pattern was also observed by "adv." written in place of or with Rx on prescriptions of about 14% of private practitioners. Rx which has symbolic importance was replaced by advice or adv. observed also by K.U.Ansari *et al.*³

In majority of prescriptions dosage form of drugs along with name properly written but due improvement was needed in frequency of drug administration, duration and dose is given. Teaching doctors were prescribing drugs only for three days irrespective to disease because drugs given free of cost to certain patients from hospital for that duration only. Dose, duration and frequency of drug administration were mentioned more in prescriptions of TDs than prescriptions of PPs.

Average numbers of drugs prescribed per prescription were found high in PPs than that of TDs, and injectable drugs more frequently prescribed by PPs similar trends were observed from the past study in Pondicherry.¹⁴ PPs have prescribed drug combinations more than twice in comparison to TDs. The combinations of analgesics and antimicrobials were more commonly prescribed. There



are only few evidence that analgesic combination are better than its component alone. The cough mixtures were prescribed in both set up of doctors without thinking their rationality i.e. whether it contains expectorants, cough suppressants, antihistamines, sympathomimetics, alcohol and CNS depressants without any rational basis.¹⁵

It was observed in our study that generic preparations (71.31%) were more commonly prescribed than branded medicines by TDs whereas only 4.17% by PPs. The generic drugs prescriptions by PPs were unsatisfactory. Indian markets have about 70000 branded medicines where as essential drugs are only around 350, and so many irrational combinations are available. Our governments are unable to control it and doctors were continuously prescribing it. Ideally they should have discouraged it. It increases cost of therapy, chance of drug interaction and ADR (adverse drug reaction). It will also lead to development of bacterial resistance.

Current survey shows that the prescriptions from teaching doctors were comparatively more cost effective and rational as evidenced by fewer numbers of drugs prescribed, more generic prescriptions and selections of cheaper brands, essential medicines followed the guidelines of WHO.

CONCLUSION

Incomplete, illegible and irrational prescriptions were common norm in Teaching as well as in private set up, these are very difficult to correct. The adherence to the typical format of prescription was more commonly observed with the prescriptions of PPs than TDs but deficiencies were observed in both prescriptions. The prescriptions of TDs were more rational and cost effective than PPs. The scopes of improvement of prescribing behaviors widely exist for not only to private practitioners but also to teaching doctors. So, intervention is needed to improve prescribing patterns of doctors. Especial emphasis should be given to budding doctors to write rational and cost effective prescriptions in teaching hospitals so that it becomes their habit when they come in community. Clear and comprehensive rules should be formulated and implemented by the government. Awareness programs and educational methods should be

involved at grass root levels so that rational and cost effective treatments come into reality.

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About Corresponding Author: Dr. Ashutosh Chourishi



Dr. Ashutosh Chourishi is graduated (MBBS) and post graduated (MD, Pharmacology) from NSCB Medical College Jabalpur, India. Now he is working as Associate Professor in dept. of pharmacology at R.D. Gardi Medical College, Ujjain, India. He is having 8 years of teaching experience. He handled Multiple clinical trial projects at Medical College, also guiding Under graduate and post graduate medical students.