



Comparative study of prescribing behaviors of government doctors of teaching hospital and private practitioners in Jhalawar City (Rajasthan)

Manoj kumar saurabh¹, Ashish kumar yadav², Pankaj Gupta², Ashish Singhai³,
Avinash Saurabh³

¹Department of Pharmacology, Jhalawar Medical College, Jhalawar (Raj.), India

²Department of Community Medicine, Jhalawar Medical College, Jhalawar, (Raj), India

³V.N.S. College of Pharmacy, Bhopal, India

Abstract:

To compare various aspects of prescribing behaviors of government doctors of teaching hospital and private practitioners. Prescription audit was conducted for a period of 2 months for out patient departments (OPDs) in tertiary hospital and retail medical shops in Jhalawar 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 were 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. The adherence to the typical format of prescription was more common with the prescriptions of PPs than GDs but deficiencies were observed in both prescriptions. Private practitioners were writing slightly more illegible prescriptions than Government doctors i.e. 24% vs 22%. All prescriptions of PPs were followed polypharmacy whereas 87.13% of GDs prescriptions. Among the total drugs prescribed in different categories by GDs, more than 45% (1003 out of 2217) were prescribed from two major groups (Antimicrobials 25.44%, NSAIDs 19.08 %) followed by CVS drugs/antihypertensive 225 (10.14) Antihistaminic/and for cough preparations 208 (9.38), Antipsychotic/drugs for CNS disorder 149 (6.72) Vitamins/minerals 143 (6.45). There were certain variation except first two groups, different categories of drugs prescribed by PPs were Antimicrobials (25.96%), NSAIDs (21.66%) Vitamins/minerals 16.22%, Antihistaminic/and for cough preparation 10.03%. Average no of drugs prescribe per prescription were more by PPs than GDs (3.12 vs 2.79). GDs were prescribing much more generic drugs (67.25%) essential medicines (68.76%) in comparison to PPs. The prescriptions of GDs 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 government doctors. An urgent intervention is needed to ensure that patients are able to get rational and cost effective therapy.

Keyword: Prescription audit, teaching hospital, private practitioners, rational use of drug.

Introduction:

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 [1]. Medicines should be used only when essential but in practice, they are used too readily. Irrational prescription is a common occurrence throughout in the world [2], it is seen every where (in teaching and non teaching institution) at all level (senior and juniors) in all categories (family physicians ,specialists, and superspecialist). Prescription audit shows the way towards rational use of drug [3]. 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 [4].

According to planning commission paper of 2009, health care expenses were responsible over half of all cases decline into poverty. It was estimated in 2004-05, an additional 39 million people were pushed into poverty due to out of pocket payment. NSSO data for same year had shown that of the total medical expenditure pre capita, medicines alone accounted for 74% of the expenses in the rural and 67% in urban areas. 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 [5]. 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”[6]. To cut down the cost of routine medical expenses, centre and certain state government including government of Rajasthan going to open or have opened several Jan Aushadhi units. Average market rate of one strip of tab Ciprofloxacin is around fifty five rupees but at Jan Ausdhi it costs only 11.10 rupees. The government doctors of Rajasthan have been already instructed to use generic names of the medicines.

In India, the availability and utilization of health service is very poor with the government sector meeting the demands of only 18% of the out-patients 40% of in-patients care [7]. In other word, around 80% of out-patient care and 60% of in-patient care mainly done by private sector. Thus appropriate policy can not be formulated by government without considering private sector

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

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 & Methods:

Comparative cross sectional study was carried out for a period of 2 month in two different set up GDs of teaching hospital and private practitioner

1.Mode of collection of prescriptions for government doctors

To promote rational and cost-effective prescription, a prescription audit committee has been constituted at tertiary teaching hospital of Jhalawar, Rajasthan, for continuous evaluation and assessment of prescribing nature of doctors. A patient based prescription audit was done using cross sectional study design for a period of 2 months (September 09 to October 09) on various out patient departments (OPDs). 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. Seven hundred ninety two (792) prescriptions were collected from teaching hospital for government doctors (GDs)

2. Mode of collection of prescriptions for private practitioners

Across section study during the same period was done, prescriptions were collected during same period from patients at six retail medical shops located at least four kilometer away from government tertiary hospital, investigator had copied proscriptions 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 hundreds twenty four prescriptions (424) were collected from retail shops of medicine for evolution of proscriptions for private practitioners (PPs).

All prescriptions (1216) 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 [3]:

- All aspects of prescription were very clear to read
- All aspects of prescription were clear but effort required to read it.
- any one aspect (e.g.name of drug/dose/duration) not clearly written
- At least one aspect of prescription 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 recipe meaning though (you) take. 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, amount and strength of each ingredient to be given.

(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 extent of conformity to RSSTG,[9] (Rajasthan state standard treatment guidelines) and W.H.O guide to Good prescribing, a practical manual.

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

It is done with list of essential Medicines[10], National list 2003 India [10]

(D) 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, twelve hundred sixteen (1216) prescriptions were collected. Out of these prescriptions 792 for GDs and 424 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, age and sex however complete address of patients were completely missing in all prescriptions. Weight was only mentioned in about half (52.3 %) of pediatric patients of prescriptions of GDs but result were better (74.8%) for PPs. Majority (96.1%) 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 twenty six percent of total drugs prescribed for GDs. Drugs name along with dosage form , route of drug administration and dose frequency were mention in about 90 %prescriptions of PPs .A clear instruction to the pharmacist was missing in nearly one third prescription of GDs where as majority(92%)of PPs provide this information (Table 1). only verbal instruction to the patient was given but majority of patients or their attendant were able to tell correct instructions given by

Table1: Layout of Prescription and its Legibility

	Prescriptions of GDs	Prescriptions of PPs
(a)Content of prescriptions		
Superscription		
Date on prescriptions	100%	100%
Name of patient	100%	100%
Sex	42%	83%
Age of patient	100 %	100%
Weight of patient	52.3%	74.8%
Rx	100%(printed)	87.5% adv.13.5% in place of Rx
Inscription		
Dosage form and drugs name	96.1%	89.37%
Dose, duration and frequency of drugs Administration	59%	89.37%
Subscription		
Instruction to pharmacist	72%	92%
Signa		
Complete instruction to patient	0% Written instruction Completely absent	0% incomplete written instruction
Signature of prescriber		
Prescribers' identity	0% Only hospital name& address mentioned	100% printed personal letter head is used
(b)Legibility (clarity in handwriting) of Prescriptions		
Can be read whole prescription	78%	76%
At least one aspects unable to read	22%	24%

government doctors whereas incomplete instructions were written in majority of prescriptions of PPs. It was more understandable to the patients or their attendants. However both were unsatisfactory in our view. All prescriptions were signed by prescriber, but it lacks prescriber's identity of GDs. Identity of private practioners 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 proscriptions as shown in table 1. A similar pattern for legibility of

prescription was found in GDs and PPs (table 1)

Seven hundred ninety two prescriptions had 2217drugs of government doctors and Four hundred twenty four prescriptions had 1325 drugs of PPs. All prescription were evaluated for average drug per prescription. It was found that the private practioners (PPs) prescribed in average (3.12) more drugs as compared to the GDs (2.79) (Table 1.1)..It was revealed that all prescriptions of PPs contains more than one drugs per prescriptions whereas nearly 13% (12.87%)of prescriptions contain only one drug. About thirty six percent (35.81%) prescriptions of GDs contain at least four

1	102 (12.87))	0
2	193 (24.36)	63 (14.85)
3	227 (28.66)	102 (24.05)
4	159 (21.81)	114 (26.88)
5	74 (9.34)	106 (25.00)
6	31 (3.91)	31 (7.31)
7	06 (0.75)	05 (1.17)
8	0	02 (0.47)
9	0	01 (0.23)

Table 1.2: Analysis of prescription

	PGDs	PPPs
Number of Prescription	792	424
Number of drugs prescribed	2217	1325
Number of drugs prescribed per prescription	2.79	3.12
Number of drugs prescribed by generic name	1491 (67.25)	18 (4.24)
Number of essential drugs from essential medicine list	1527 (68.76)	457 (34.49)
Number drugs combination prescribed	325 (14.26)	412 (31.09)
Drugs combination from essential medicine list	142 (43.69)	76 (18.44)
Number of injectable prescribed	67 (3.02)	106 (8.0)
PGDs-prescriptions of government doctors ,PPPs-prescriptions of Private practitioners		
In bracket indicates percentage		

drugs per prescription as compared to 61.28% of prescriptions of PPs (table 1.3). Maximum seven and nine drugs were prescribed by GDs and PPs but there frequencies were very less (1.1).

Generic medicine and use of drugs in compliance with essential drug list were found 1491(67.25%) and 1527 (68.76%) of total drug prescribed by GDs Table 1.2. There was marked difference in comparison to prescription of PPs in which generic drugs are very few 18(1.3%).

Essential medicines were also prescribed less 457(34.49%) than that of GDs .Injections were prescribed more (8%) by PPs than GDs which were 3.02 % (1.2).

Three hundred twenty five and four hundred twelve drug combinations were prescribed

by GDs and PPs among them 142(43.69%) and 76(18.44%) were from standard drug combinations listed by W.H.O (1.2).

Among the total drugs prescribed in different categories by GDs, more than forty five percent (1003 out of 2217) were prescribed from two major groups (Antimicrobials 25.44%, NSAIDs 19.08 %) as shown in table 1.3 followed by CVS drugs/antihypertensive 225 (10.14) Antihistaminic/and for cough preparations 208 (9.38), Antipsychotic/drugs for CNS disorder 149 (6.72) Vitamins/minerals 143 (6.45) has shown in table 1.3. There were certain variation in different categories of drug prescribed by PPs , two similar major groups Antimicrobials (25.96%) and NSAIDs (21.66%) drugs around 47% were

Table 1.3: different categories of drugs prescribed

	PGDs	PPPs
Antimicrobials	564 (25.44)	344 (25.96)
NSAIDs	439 (19.80)	287(21.66)
Vitamins/minerals	143 (6.45)	215 (16.22)
H2blockers/antacid	117 (5.27)	49 (3.69)
CVS drugs/antihypertensive	225 (10.14)	52 (3.92)
Antipsychotic/drugs for CNS disorder	149 (6.72)	22 (1.66)
Antihistaminic/and for cough preparation	208 (9.38)	133(10.03)
Antidiabetics	67 (3.02)	29 (2.19)
Steroids	52 (2.34)	52(3.92)
Non allopathic Medicines	04 (.18)	16 (1.20)
Others	224 (10.10)	126(9.50)
PGDs-prescriptions of government doctors, PPPs-prescriptions of Private practitioners		
In bracket indicates percentage		

used. Other more commonly prescribed groups were Vitamins/minerals 16.22%, Antihistaminic/and for cough preparation 10.03%. Synthetic penicillin and cotrimaxazole were other commonly used antimicrobials by GDs, but different generation of cephalosporins and microlides were more prescribed by PPs than GDs. Number prescriptions of PPs contains cotrimaxazole. Quinolones were preferred antimicrobial by both sectors of doctors. Paracetamol and Nemusulide were preferred NSAIDs by GDs and PPs respectively. Uses of acronyms were found in the prescription of GDs only. Multivitamins and minerals (6.45%) in which iron preparation were more than three percent prescribed to the patients by GDs which shows that unnecessary economical burden was not made on patients. PPs were prescribing 16.5% vitamins and minerals. None of the prescriptions of both sectors contained drug banned by drug controller of India.

Rationality of prescription was assessed by Rajasthan standard treatment guidelines (RSSTGs) 2006 and W.H.O guide to good prescribing. Diagnosis or provisional diagnosis was not written in 23.98% (190) and 26.17(111) of prescriptions GDs and PPs. 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 was bias. Over prescribing of drugs and polypharmacy was very common by both groups of doctor, some examples are for diarrhea, oral rehydration solution is sufficient but many doctors had prescribed a irrational combinations ciprofloxacin and tinidazole. Similarly viral fever can be treated 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. In Indian markets have about 70000 branded medicines where as essential medicines are only around 350 drugs and so many irrational combinations are available. Our governments are unable to control it Doctors were prescribing it. ideally they should have discourage it. It increases cost of therapy, chance of drug interaction and ADR (adverse drug reaction). It will also lead to development of bacterial resistance.

All authors had evaluated each prescription on the basis Rajasthan state standard treatment guidelines and W.H.O guide to good prescribing for rationality. We had concluded that irrationality in prescribing drugs was close to forty percent (38%) by GDs and about 51% by PPs. In other words, more than sixty percent (62%) of GDs and 49% of PPs prescriptions were appropriate in terms of efficacy, safety, suitability and cost effectiveness which were evaluated on the basis of RSSTGs (2006) and W.H.O guide to good prescribing

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 [11]. Unclear prescriptions result in over 150 millions calls from pharmacist to physicians in the united state annually [12].

Prescriber identification was not found in prescription of GDs, 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, reg.no., post) can be cheap and easy useful intervention to improve the quality of prescription[13].Deficiency in detail required for patient and prescribe identifications had also been reported in other studies also[14,15 ,16].

Three parameter of superscription, name, age along with date on which prescriptions were written, mentioned in all of the prescriptions irrespective to government doctors or private practitioners. Which was better than the other past similar studies lacked [1,16] But sex was mentioned less than half of prescriptions of GDs and more than quarter of prescriptions of PPs. Again weight which is important parameter to decide dose of drug to pediatric patients was written only about 50% of GDs and 83 % of PPs in prescriptions. A change of

prescription pattern was also observe by "adv. written in place of or with of Rx on prescriptions of both sectors of clinicians. Rx which has symbolic importance was replaced by advice or adv. observed also by K.U.Ansari et al.[1]

Subscriptions were better written by private practitioner to that of counterpart. 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. Government 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. Out of ten prescriptions nearly four prescription were found incorrect inscription (dose, duration and frequency) in the prescription of GDs.

Average no of drugs prescribed per prescription were found high in PPs that of GDs, and injectable drugs more frequently prescribed by PPs similar trends were observed from the past study in Pondicherry [17]. PPs were prescribing drug combinations more than doubled in comparison to GDs. The combinations of analgesics and antimicrobials were more commonly prescribed. There is few evidence that any analgesic combination better than its component alone [18].The cough mixtures were prescribed in both set up of doctors without thinking their rationality, it contains expectorants, cough suppressants, antihistamines, sympathomimetics, alcohol and CNS depressants without any rational basis [19].

It was observed in our study that generic preparations (67.25%) were more commonly prescribed than branded medicines by GDs whereas only 4.25% by PPs similar patterns were observed 43.9% and 6.85% respectively in the study of auditing of prescription in a government teaching hospital and retail medical stores in

Pondicherry[17].The generic drugs prescriptions by PPs was unsatisfactory level however it was found high that of study from Bangladesh (.008%) but essentials medicines (50%) were less (34,5%) in our study[20]. Current survey shows that the prescriptions from government teaching hospital 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 RSSTG andWHO.

Conclusion: Incomplete, illegible and irritation prescription order were common norm in government as well as in private set up these are very difficult to correct So Intervention is needed to improve prescribing behaviors of doctors. Especial emphasis should be given to budding doctors to write rational and cost effective prescriptions in teaching hospitals so that it becomes there habit when they come in community. Clear and comprehensives 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.

Acknowledgement: We gratefully acknowledge Dr. P.K Gupta, Dean, and all clinicians for necessary support throughout the study, interviewing, and interaction with patients in OPDs. and collection of data.

References:

[1] Ansari K.U, Singh.S, Panday R.C., *Indian J of Pharmacol.* 1998, 30, 43-46.
 [2] Soumerai SB., *Aust J Hosp Pharm.* 1988(Suppl) 18, 9-16

[3] Saurabh MK.,Jaykaran,Yadav AK.,Jyoti N., *J of pharmacy research* 2010,3(3),474-477
 [4] W.H.O conference of experts, Narobi, 1985.
 [5] Sharma P.C, Kumar S, Phawa A, Sharma R, *The Internet Journal of Third World Medicine*, 2009, 8:
 [6] W.H.O. Model list of essential drugs. Geneva: World Health Organization, 1988
 [7] Nath A.,*JK .science.* 2008, 10(4), 206-207.
 [8] Buxton Iain L.O., Principles of prescription order writing and patient compliance, Goodman and Gilman's the pharmacological basis of Therapeutics, *McGRAW-HILL, Newyork.*, 2006(11) ,pp. 1777-86.
 [9] Sharma S, SathiG.R, .Sachdev GK, GuptaU, Rajasthan state standard treatment guidelines (special edition):*BI publication Pvt Ltd: New Delhi: 2006,1- 482.*
 [10] Tripathi K.D,Essentials of Medical Pharmacology: 6: Jaypee Brothers Medical Publishers (P) Ltd: New Delhi: 2008,pp. 903-907.
 [11] WHO/DAP 1994. Gide to Good Prescribing Geneva,pp 62.
 [12] Institute for Safe Medication Practice,A Call to Action, Eliminate Handwritten Prescriptions with in 3 years !2000. A White Paper.
 [13] Boehringer PA, Rylander J ,Dizon DT, Peterson MW.*Q Manage health care* 2007,16(3),215-218.
 [14] Desta Z, Abdulwhab M. *East Afr Med J* 1996,73 (2),115-119.
 [15] Irshid YM, Al Homrany M, Hamdi AA, Adjeopon-yamoah KK,Mafouz AA, East Mediterr Health J 2005,11(5-6),922-928.
 [16] Patel V, Vaidya R, Naik D, Borker P,*Jof Post graduate Med.* 2005,51,1,9-12.
 [17] Shewade DG, Pradhan S C, *Indian J of pharmacol* 1998,30,408-410.
 [18] Beares WT,Analgesic combinations In,Lasanga, editor.combination drugs, Their uses and regulation. *New York, Stration International Medical Book Coperation*, 1975,pp.52-75.
 [19] Kastury N, Singh S, Ansari K.U. *Indian J of Pharmacol.* 1999, 31, 367-369.
 [20] Rahman Z, NazneenR, Begam M ,*Bangladesh J Pharmacol* 2009,4,73-75