

## STUDY OF PRESCRIBING HABITS AND ASSESSMENT OF RATIONAL USE OF DRUGS AMONG DOCTORS OF PRIMARY HEALTH CARE FACILITIES

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### ABSTRACT

A descriptive study of prescriptions of outdoor patients was conducted to find out the prescribing pattern and rational use of drugs among doctors of primary health care delivery centers of Jhalawar district of Rajasthan. Prescription audit was conducted for a period of two months. After taking consent of doctors and patients their respective prescriptions were copied and evaluations were done on following heading (1) Legibility of prescription (2) Adherence to well defined format (3) Prescribing indicator by WHO (4) Rational use of drugs in prescriptions. Six hundred prescriptions were analyzed. Legible prescription was 93.5%. The quality of format of the prescription was unsatisfactory because age or sex of patients was not mentioned in 7% and their addresses were missing in all prescription. Incorrectly written dose or duration of therapy in 21% of total drugs prescribed. A clear instruction to the pharmacist was not available in 22% of prescriptions and only verbal instruction to the patient was given. Ninety four percent prescriptions were signed by prescriber, but all prescriptions lack their identity. Polypharmacy was common, with 89% of prescriptions and average numbers of drugs were 2.83 per encounter. Antimicrobials were prescribed in around two third of the prescriptions and injections were prescribed in 7.33% of the prescriptions. Out of total drugs (1696), Generic medicines were 25.70% were as essential drugs was 80.42%. Among the total drugs used in different categories 86% (1459 out of 1696) were prescribed from major five groups (antimicrobials 28%, NSAIDs 24.88%, acid secretion reducing agent 11.46%, and vitamins/hematinics 13.91%). More than three quarter of prescriptions were not up to the marks of standards guidelines or were irrational. This study concludes that quality of prescription, both in term of format and content of medicines prescribed were inadequate. It arouses the urgent need of intervention by implementing clear and effective legislation and various educational methods.

**Keywords:** Rational use of drug, Primary Health care, Prescription audit, Generic medicines, Essential drugs

### INTRODUCTION

Primary Health care is integral part or back bone of the any country's health care delivery system, its importance is vital when consider for the developing countries. Our country has adopted primary health care in 1978 at Alma Ata Conference to achieve "health for all" at that time and presently "Millennium Development Goals" <sup>1</sup>. In this conference defined Primary health care as "it is essential health care made universally accessible to individuals and acceptance to them, through their full participation and at a cost the community and country can afford" <sup>2</sup>. Eighty two percent of the health expenditure in the country paid by peoples themselves of which sixty two percent on medicines, <sup>3</sup> large percentage of this goes in vain because of irrational prescription selection of non essential medicines and costlier brand in place of generic drugs. Irrational, over and bad prescription habits are responsible for ineffective, unsafe and costly treatment. So rational use of drugs has multi- dimensional aspects which include medical, social and economical values, <sup>4</sup> as reflects in the WHO definition: "Rational use of drugs requires that patients receive medications 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, <sup>5, 6</sup>. One third of world population lacks access to essential medicine, <sup>7</sup>. which goes up to around sixty five percent in India, <sup>4</sup>

Rational use of drug, writing rational prescriptions and importance of essential medicines are included in MCI curriculum and pharmacologists are teaching these things to medical undergraduate students. Our study had tried to find out whether practical application of above knowledge in common practice had been incorporated by rural doctors of Jhalawar district.

Many studies were conducted regarding drugs prescribing patterns in different parts of our country but we were unable to find out even a single study conducted by involving doctors of primary health care centers of Rajasthan (Pub Med, Google, and different journals on net). This motivated us to do first study regarding prescribing skills of doctors which included exclusively primary health care system of Jhalawar district (Rajasthan).

That would evaluate and might further suggest positive modifications in prescribing practices which would help to make medical care rational and cost effective too; this was the motto behind present study.

### MATERIAL AND METHOD

A cross section descriptive study was conducted in jhalawar district of Rajasthan with approx. population of 14 lakhs, cared by 20 primary health centers (PHCs). District was divided into four clusters of geographical divisions and equal samples were collected according to sample size proportionate to size i.e. (PPS technique). Total 600 prescriptions 150 from each PHC were collected in two months (February and March). Patients referred to higher centre were not included in our studies.

### Mode of collection of data

Investigator had copied prescriptions by using digital camera after explaining the purpose of study and taking verbal consent of patient and their doctors. Carbon copies of some prescriptions were collected from doctors before the patients leaving from the PHCs.

Data were analyzed on following heading:

**Legibility of prescription:** assessed on mainly two heading

- All aspects of prescription were clear to read with or without effort (legible)
- At least one aspect partially unclear or not clear to read (illegible)

Legible prescription have given 1 score and 0 for illegible.

### Format of prescription<sup>8</sup>

- Superscription* includes the date the prescription order was written, demographic profile like the names, address, weight, and age of the patient, and the symbol Rx.

- b) *Inscription* body of prescription containing the official names and amount or strength of each ingredient to be compounded.
- c) *Subscription* is the instruction to the pharmacist as to the mode of compounding, amount to be compounded, the form of the final medicament and division into doses if required (if given orally) and the time of administration.
- d) *Signa* and *Signature* both come under *Transcription* *Signa* or "Sig" consists of direction to the patients regarding the methods of administration.

Signature at the end of prescription and identification (Registration number of Medical council) of doctors, in our country prescriber identifications usually written above the prescription order

#### Prescribing indicator by WHO,<sup>9</sup>

- Average number of drugs per encounter
- Percentage of drug prescribed by generic name
- Percentage of prescription with antibiotics prescribed
- Percentage of prescription with an injection prescribed
- Percentage of drug prescribed from an essential medicine list

#### Commonly used class of Medicine

#### Assessment of rational use of drugs

Development of standard treatment guidelines by WHO –India program on the rational use of drug is one of the important land step for the promotion of rational use of drug.

So we have evaluated the content of prescriptions for rationality on the basis of Rajasthan state standard treatment guidelines (RSSTGs),<sup>10</sup> and W.H.O guide to good prescribing: a practical manual,<sup>11</sup>.

Data was analyzed on Microsoft excel and descriptive statistics was used for analyzing the result of study

## RESULTS

Out of 600 prescriptions, 561 prescriptions were able to score 1 point and rest 39 prescriptions have 0 point. This means 93.5% of prescription was legible. Adherences to typical format and content of the prescription are shown in Table 1. It was found that 98% prescriptions were duly dated along with patient name, either age or sex was missing in 7 % however patient address was found missing in all prescriptions. In very few prescriptions of pediatrics patient weight was written. Majority (89%) of prescriptions contain details of dosage form along with their name, 5.9% of medicine was written in abbreviation (PCM for paracetamol, CHQ for chloroquine) twenty one percent of total drugs prescribed incorrect written dose or duration of therapy A clear instruction to the pharmacist was not available in 22 % of prescriptions where as only verbal instruction to the patient was given which is unsatisfactory habits in our view. Ninety four percent prescriptions were signed by prescriber, and all prescriptions lack their identity but clearly printed name of primary health care centre and its location.

In our survey, the commonest diagnosis or presenting symptoms was pyrexia of unknown origin (PUO) or fever (26%) followed by acute upper respiratory tract infection (23%) diarrhea (11.3%), wound infection (10.50), pain in abdomen (8.66) urticaria or allergy (8%) and urinary tract infection (3.16) (Table -2). Diagnosis of PUO is only made when fever persists for at least three weeks<sup>12</sup>. So one important thing must be noticed that PUO was wrongly made diagnosis in our survey. Patients were presenting with fever, doctor written wrong diagnosis PUO but treatment given for malaria, typhoid or urinary tract infection. This mistake was done by doctor of all primary health care centers. Acute respiratory tract infections were single most common illness. Morbidity pattern in all four centers were similar but some difference in drug prescribing pattern.

Table 1: Adherence of Prescription to the Format

Content of prescriptions	Number	Percentage
<b>Superscription</b>		
Date on prescription	588	098
Name of the patients	600	100
Age/sex of patients	558	093
Address of patients	--	--
Rx (printed on prescription)	--	--
<b>Inscription</b>		
Name and dosage form of drugs	534	089
Strength and proper dose* (not mentioned )	357	21.4
<b>Subscription</b>		
Instruction to the pharmacist	468	078
<b>Transcription</b>		
(a) Signa (written instruction to pt.)	-not written--	---
(b) Signature		
Doctor identity in prescription	-not written-	---
*Out of total medicines		

Table 2: Commonest Illness Seen During Survey

Diagnosis /presenting symptoms	Prescription	Percentage of prescription
Pyrexia of unknown origin/Fever	158	26.33
Upper /acute respiratory tract infection	142	23.66
Diarrhea	068	11.33
Wound infections/abscess	063	10.50
Pain in abdomen	052	08.66
Urticaria/allergy	048	08.00
Urinary tract infection	019	03.16
Others	050	08.33

One thousand six hundred ninety six drugs were written in six hundred prescriptions. Polypharmacy was common, with 89 % of prescriptions having more than one medicine; all patients who were coming to primary health care centre were prescribed at least a medicine. Above data were mentioned in table -3

**Table 3: Polypharmacy In The Prescription**

Number of Medicine written in prescription	Number and percentage of prescription	Total number of medicines in each prescription
One	066 (11%)	066
Two	134 (22.33%)	268
Three	273 (45.5%)	819
Four	096 (16%)	384
Five	027 (4.5)	135
Six	004 (.66%)	024
Total Prescriptions	600	Total medicines 1696

The average numbers of drugs 2.83 per encounter. Among total drug prescribed 25.70% by generic name; and 80.42% drugs were prescribed from the essential drug list. Antibiotics were prescribed in around two third of the prescriptions and injections were prescribed in about 07.33 % of the prescriptions (Table-4).

Among total drugs used in different categories eighty six percent (1459 out of 1696) were prescribed from major five groups (Antimicrobials 28%, NSAIDs 24.88 %, acid secretion reducing agent 11.46 %, and vitamins/hematinics 13.91 %), table -5. Quinolone and third generation cephalosporin more prescribed by younger age group of doctors where as older age group still preferred cotrimaxazole, penicilline group, and doxycycline. Multivitamins were prescribed to around 14 % of the patients, which shows that unnecessary economical burden was made on patients. Iron was given to female patients without making diagnosis anemia, folic acid in addition to iron prescribed to mainly pregnant ladies, which was rational. None of the prescriptions contained drug banned by drug controller of India. Very high percentage of prescription contains antimicrobial 66% and NSAIDs 64% were showing indiscriminate use of these two groups of drugs.

Rationality of prescription was assessed on the basis of Rajasthan standard treatment guidelines (RSSTGs) 2006 and W.H.O guide to good prescribing by all authors. Clear diagnosis or provisional diagnosis was not written in majority of prescriptions, medicines were prescribed by taking consideration of symptoms only. Large number of medicines were used, broad spectrum of antimicrobial agents were prescribed. Doctors of primary health care centre prescribed like umbrella therapy i.e. any one drug from many prescribed drugs may cure illnesses which were highly irrational. Written instruction was not mentioned even in single prescriptions only verbal instruction was given, we equated verbal instructions to that of written instructions during assessment of rationality although it was not good practice. Over prescribing was very common e.g. ciprofloxacin and tinidazole for diarrhea, antibiotic for viral fever, many antimicrobials agent for malaria, NSAIDs or its combinations were unnecessarily used; this was also true for H2 blockers and proton pump inhibitors. It not only increases cost of therapy but also enhance the chance of drug interaction and adverse drug reaction.

By considering above mentioned factors, all authors had find that treatment written in the majority of prescriptions (476) were not match properly with guidelines mentioned in RSSTGs (2006) and W.H.O guide to good prescribing. In other words, more than three quarter of prescriptions were irrational and only twenty (20.66%) prescription were appropriate in terms of doses, efficacy, safety, suitability and cost effectiveness (rational)

**Table 4: Analysis Of Prescription On The Basis Of Prescribing Indicator (WHO)**

Average number of drugs per encounter	02.83
Percentage of drug prescribed by generic name	25.70 (436)
Percentage of drug prescribed from essential medicine* list	80.42 (1364)
Percentage of prescription with antibiotics prescribed	66.16 (397)
Percentage of prescription an injection prescribed	07.33 (44)

\*W.H.O (2007) & National list of essential Medicines (2003, India)

**Table 5: Five Most Commonly Prescribed Drugs**

Drug class	Number and Percentage of patient	Percentage of total number of medicines out of (1696)
Antimicrobial	397 (66.16)	456 ( 28.06)
NSAIDs(analgesic/Antipyretic)	386 (64.33)	422 (24.88)
Proton pump inhibitor/H2 blockers	189 ( 31.5)	189 (11.46)
*Multivitamins, /hematinics	182 ( 30.33)	236 (13.91)
Antihistamines(including cough syrup)	154 (25.66)	156 (9.19)
Others medicines	237 (13.97)	

\*multivitamins and hematinics are prescribed to 84 & 98 patients respectively

#### DISCUSSION

The aim of our study is to promote rational use of drug so as to improve the quality of medication and at the same time, reducing the cost of therapy by promoting use of generic medicines which are 40 to 60% cheaper than the innovator brand name with equal efficacy<sup>13</sup> and drugs in accordance with Essential (medicine) drugs list (EDL) is the list containing well tested older and cheaper drugs items essentially used to treat common diseases. As per WHO definition "Essential medicines are those that satisfy the priority health care needs of the population"<sup>13</sup>.

Thus the higher the compliance with this list, the more rational would be the drug prescribing pattern. The government of Rajasthan has been already instructed to all government doctors that it is mandatory to prescribe generic names of the medicines from essential drugs list. In spite of all major taken, in present scenario only one quarter of total drug had prescribe by generic name whereas essential medicines (80.42%) were used at satisfactory level. Although the cheapest brand was used in majority of prescriptions indicating that doctor were having concern on the economic consequences of drugs in prescriptions. One important reason behind fewer generic drugs was doctors having doubt about its efficacy due to presence of spurious drugs in the market, on other hand doctor are blaming for unethical promotion of drugs.

Generic drugs and essential drugs were 69.8% and 69.7% in a similar study involving doctors of tertiary centre in same district<sup>14</sup>. Branded medicines were more used in study from Goa (avg 94.5%)<sup>15</sup> and Jammu (94.5)<sup>16</sup>. Use of generic and essential medicine in previous studies were from PHC Of Osun State(Southwest) Nigeria (69.81 and 94.16)<sup>17</sup>. Madhya Pradesh (60.9% and 74.7%)<sup>18</sup>. and in government teaching hospital, Pondicherry (43.9)<sup>19</sup>.

There was less than two percent prescription containing diagnosis of mental illness diabetes mellitus and Hypertension observed although these diseases are prevalent in the community. A study of Saudi's PHC survey had mentioned 2.1% each diabetic and hypertensive patient but mental disease diagnosis not made<sup>20</sup>. Doctor of PHC was writing more legible prescription (93.5%) than tertiary centre (78%) of Jhalawar,<sup>14</sup> and by doctor of PHC of Lucknow district (51.7%)<sup>21</sup>. It was appreciable and it prevents prescription error. It is the commonest form of avoidable medication error. The possibility of re-use of same prescription was completely removed as every prescription was duly dated. Inscription portion in the prescription was better than the PHC doctor of Jammu & Kashmir.

In present study, average drugs per prescription was found 2.83 which was approximately

in Similar fashion to PHC's from Sharjah (2.8)<sup>22</sup>, and Southern India (2.71)<sup>23</sup> and much less than reported figure of 6.11 and 3.5 of the study conducted in PHC's South West Nigeria<sup>17</sup> and Lucknow<sup>21</sup> however the figures were high as compared to studies conducted in PHC's of Andhra Pradesh (2.1)<sup>24</sup> and Bangladesh (1.44)<sup>25</sup>. It means that doctor of PHC had tendency towards prescribing more drugs than necessary. The over use of injectable preparations is common in many developing countries<sup>26</sup>. In Our study injectable medicines were prescribe to 7.44 % of prescription relatively better data as compared to Southern India (47.8)<sup>23</sup> and Yemen (25-60%)<sup>27</sup> but it was in contrast to Srilankan's study in which only 1% of drugs used were injectables<sup>26</sup>.

Only Verbal instructions were given, this might have accounted due to over patient load.

One fifth prescriptions were rational, which was much below the expected level. The extent of rationality of prescriptions was much below that expressed in a nationwide multicentric study,<sup>28</sup> and a household study in rural Varanasi (35.67%)<sup>4</sup> So all three method of intervention like educational, managerial and regulatory affair should be urgently implemented.

There are many ways of intervention for improving doctors' prescribing skills. These have included audit studies<sup>29</sup> irrational prescriptions should referred back to prescribing doctors for group discussion and feedback, introduction of general practice drug formulary<sup>30</sup> or hospital formulary<sup>31</sup> guidelines for antibiotics ,analgesic, non steroidal anti-inflammatory drugs and various education program like Continuing medical education programs (CMEs) and seminar for rational therapeutics. Authorities should always remember involvement of primary care doctor made compulsory in above intervention method.

Rational prescribing should be promoted in national and local medical meetings at all care centre and the input from rural doctor should be considered<sup>32</sup>

The government should enforce clear and comprehensives legislation regarding this by honest intention. One major step towards this goal is going to be introduced from 2<sup>nd</sup> October 11 that includes free drug distribution to all patients attended at all government's health centers .

At last but important, clinical pharmacologist should teach and give special emphasis on practical pharmacology training on common problems (like rational use of drug, pharmacovigilance, therapeutics to common illness and emergencies ) than the theoretical knowledge to undergraduate students so that patient care does not suffer at the cost of knowledge or habit of prescribers.

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