Section: Community Medicine

Original Research Article

A STUDY ON PRESCRIPTION PRACTICES, MEDICINES DISPENSING PRACTICES AND USE OF ESSENTIAL MEDICINES IN THE PRIMARY HEALTH CENTRES OF KURNOOL DISTRICT, ANDHRA PRADESH.

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ABSTRACT

Background: Injudicious usage of antibiotics may lead to severe antimicrobial resistance, which has been highlighted by World Health Day 2011 theme "Antimicrobial resistance: No action today, no cure tomorrow."
Aim: To describe the rational prescription practices in the Kurnool district primary Health centres
Materials and Methods: After getting approval from IEC, Kurnool medical college, Kurnool, Permission was obtained from the District Medical & Health Officer, Kurnool District to carry out the study. Before visit to PHC, medical officer of respective PHC was contacted and informed about the visit. Each PHC was visited in person by investigator and using pretested, semi structured questionnaire, Study was conducted among the PHCs of Kurnool District. A total of 600 exit interviews (from each PHC-30 interviews) were conducted among patients, who attended the OPD, on every Monday and Friday.
Results: In the current study, on an average12.25 prescriptions had the antibiotics, 7.15 prescriptions had injections, 2.85 prescriptions were encountered with polypharmacy in each PHC. Average consultation time for 50 patients was 92.2 min, and average dispensing time for 50 patients in each PHC was 8973 sec (149.55 min). Average drugs prescribed for 50 patients from each PHC was 88.7 and average drugs dispensed was 80.3. Average drugs adequately labelled were 59.9. All the PHCs included in the study sample had Essential medicines formulary and E-aushadi.
Conclusion: It was found in the present study that the prescription practices don't conform to the stipulated guidelines in majority of cases, especially use of antibiotics. Hence there is a need to train the health care providers about the rational use of injections and antibiotics.
Keywords: Antibiotics, PHC, Prescription, Rational use.

INTRODUCTION

World Antibiotic 1st Awareness Week observed from November 16 to 22 of 2015 (theme, Antibiotics: Handle with Care) aiming at enhancing awareness of global antibiotic resistance and to encourage best practices among the general public, health workers, and policy makers to avoid the further emergence and spread of antibiotic resistance. Injudicious usage of antibiotics may lead to severe antimicrobial resistance, which has been highlighted by World Health Day 2011 theme **"Antimicrobial resistance: No action today, no cure tomorrow."**

A prescription is an instruction from a prescriber to a dispenser. All prescription orders should be legible, unambiguous, dated (time in case of chart order), and signed clearly for optimal communication between prescriber, pharmacist, and nurse. As per the estimates of the World Health Organization (WHO) worldwide more than half of all the medicines are prescribed, dispensed or sold inappropriately and about one-third of the world's population lack access to essential medicines.[1,2]

The Government of Andhra Pradesh, in 2010, published essential medicines list (EML) and standard treatment guidelines (STG) for use in the primary health care facilities in the State.[3] Since the implementation of these guidelines, there was no formal assessment of the prescription practices in the State.

Aims and Objectives

a. To describe the prescription practices
b. To assess the medicines dispensing practices
c. To identify the availability of essential medicines in the primary health centres of Kurnool district, Andhra Pradesh.

Review of Literature

PRESCRIPTION WRITING

A prescription is an instruction from a prescriber to a dispenser. All prescriptions orders should be legible, unambiguous, dated (and time in the case of chart order), and signed clearly for optimal communication between prescriber, pharmacist, and nurse. A good prescription or chart order should contain sufficient information to permit the pharmacist or nurse to discover possible errors before the drug is dispensed or administered. The prescriber is not always a doctor but can also be a paramedical worker, such as a medical assistant, a midwife or a nurse. The dispenser is not always a pharmacist, but can be a pharmacy technician, an assistant or a nurse. The following guidelines will help to ensure that prescriptions are correctly interpreted and leave no doubt about the intention of the prescriber.

Prescription forms the most important requirement is that the prescription be clear. It should be legible and indicate precisely what should be given. The local language is preferred.

Prescription from a private hospital[4]

The prescriber's name, address and telephone number. This will allow either the patient or the dispenser to contact the prescriber for any clarification or potential problem with the prescription. Date of the prescription, name, and form, strength of the drug and duration of treatment. The International Non-proprietary name of the drug should always be used. If there is a specific reason to prescribe a special brand, the trade name can be added. The pharmaceutical form (for example 'tablet', 'oral solution', 'eye ointment') should also be stated.

RATIONAL PRESCRIBING

Defining Rational Use of Drugs,[5,6]

People may have different perceptions and meanings regarding rational use of drugs, or more specifically regarding rational prescribing. However, the conference of Experts on the Rational Use of Drugs, convened by the World Health organization in Nairobi in 1985, defined rational use as follows:

"Rational use of drugs requires that patients receive medicines appropriate to their clinical needs, in doses that meet their own individual requirements", for an adequate period of time, and at the lowest cost to them and their community. This is very much a medical-model definition.

The requirements for rational use will be fulfilled if the process of prescribing is appropriately followed. This process includes steps in defining a patient's problems (or diagnosis); in defining effective and safe treatments (drugs and non-drugs); in selecting appropriate drugs, dosage, and duration; in writing a prescription; in giving patients adequate information; and in planning to evaluate treatment responses. The definition implies that rational use of drugs, especially rational prescribing,

- The WHO Model List of Essential Medicines has been updated every two years since 1977. The first edition of the "WHO Model List of Essential Medicines for Children", was published in 2007 while the 6th edition was published in 2017.[7,8] It was created to make sure that the needs of children were systematically considered such as availability of proper formulations.[7] The first edition contained 450 formulations of 200 different medications. The 20th Essential Medicines List, on March 2017, WHO tool to expand access to medicines.[8,9]

MATERIAL AND METHODS

Study area

Administrative limits of united Kurnool district. United Kurnool district is divided into Kurnool, Adoni and Nandlal revenue divisions. Study was conducted in 20 PHCs, 7 PHCs from each revenue divisions i.e. Adoni, Kurnool, 6 PHCs from Nandyal revenue division

Sampling method

There are total 83 PHCs in the United Kurnool district; among those 40 are 24×7 PHCs, distributed among 3 revenue divisions as follows

a. In Kurnool division: 11 PHCs
b. In Adoni division: 14 PHCs
c. In Nandyala division: 15PHCs

Among 83 PHCs, 20 PHCs were selected by stratified random sampling and 7 PHCs from each revenue divisions i.e. Adoni, Kurnool and 6 PHCs from Nandyal revenue division were selected by simple random sampling. PHCs with > 50 outpatient per day were included into the study. Present study was a cross sectional study, carried out during November 2015 to January 2017

Method of Collection of Data

After getting approval from IEC, Kurnool medical college, Kurnool, Permission was obtained from the District Medical & Health Officer, Kurnool District to carry out the study.

Before the visit to PHC, medical officer of respective PHC was contacted and informed about the visit. Each PHC was visited in person by investigator and using pretested, semi structured questionnaire, Study was conducted among the PHCs of Kurnool District. A total of 600 exit

interviews (from each PHC-30 interviews) were conducted among patients, who attended the OPD, on every Monday and Friday. The respondents were randomly selected by the interviewer on the day of the visit. After obtaining informed consent from the interviewee; interview was conducted to collect the data. If the age group of the patient was between 0-10 years, the primary care giver accompanying them was the respondent.

Data was analysed by using by Microsoft Excel 2013. We used five measurements to describe the irrational drug prescribing practices. Percentage of encounters with an antibiotic prescribed, average number of drugs per encounter, percentage of encounters with an injection prescribed, percentage of drugs prescribed by generic name and percentage of drugs prescribed from National Essential Medicines List or Formulary. To assess the rational drug use comprehensively, we developed an index called Index of Rational Drug Prescribing (IRDP) by applying a mathematical model developed by Zhang and Zhi 10 for comprehensive appraisal of medical care. The method has been validated and used in medical and health research. We then derived five indicators of rational drug prescribing from the above five measures according to the optimal levels of prescribing indicators. All the five prescribing indicators had the same optimal index of 1; the closer to 1, the more rational a drug prescribing. The index of rational antibiotic prescribing was defined as dividing the optimal level (30%) by the percentage of prescriptions including antibiotic. The index of safety injection was calculated by dividing the optimal level (10%) by the percentage of prescriptions including injection. Generic name index was measured by the percentage of drugs prescribed by generic name and so did in essential medicine index. In this study, prescriptions with five or more drugs were defined as polypharmacy. And the index of polypharmacy was calculated by dividing the optimal level (3%) by the percentage of prescriptions including polypharmacy. A synthetic index, namely IRDP, is calculated by adding up all the five indices below.

IRDP Calculation

S.No	Prescribing Indicators	Optimal level (%)	Optimal index
1	% Prescription including antibiotic	<30	1
2	% Polypharmacy prescription	<3	1
3	% Prescriptions including injection	<10	1
4	% Drugs prescribed by generic name	100	1
5	% Drugs prescribed from essential medicines list or formulary	100	1

RESULTS

The present study was a community based cross-sectional study.

I. Description of Socio Demographic Profile:

Gender wise distribution of respondents

out of 600 respondents, majority were females 331 (55.16%).

Age wise distribution of respondents

Above table shows that the mean age of the respondents was 31.57 years (SD=20.34). Majority were in the age group of 0-10yrs (24%). Among them 50.69% were males and 49.31% were females.

out of 600 respondents, majority were unemployed (49.33%) with females constituting 60.14%. Among the unskilled (27.17%), majority were females (68.1%.).

II. Description of common presenting symptoms:

out of 600 respondents, majority of the respondents presented with complaints of fever, cold, cough, breathlessness 263 (43.83%), followed by joint pains, low back ache 85 (14.16%), itching 82 (13.67%), revisit among known hypertensives & diabetics 79 (13.17%), loose stools with abdominal pain 41 (6.83%), wound &trauma 21 (3.5%), amenorrhea 19 (3.17%) and dental pain 10 (1.67%).

III. PHC wise Index of rational drug prescribing (IRDP)

In the current study, on an average12.25 prescriptions had the antibiotics, in each PHC, maximum 20 antibiotic prescriptions were encountered in Holagunda PHC and minimum 5 antibiotic prescriptions were encountered in Devanakonda PHC. On average 7.15 prescriptions had injections in each PHC, maximum 13 injections were encountered in Kottalacheruvu PHC and minimum 3 injections were encountered in Sanjamala PHC. On an average 2.85 prescriptions were encountered with polypharmacy, maximum 9 polypharmacy prescriptions were encountered in Gudur PHC and minimum polypharmacy prescriptions were from Gajulapalli and Bandi atmakur. [Table 1]

In present study, average consultation time for 50 patients in each PHC was 92.2 min, 117 minutes maximum consultation time spending in Gajulapalli PHC and 73 minutes, minimum consultation time in Kosigi PHC.

Average dispensing time for 50 patients in each PHC was 8973 sec (149.55 min), PHC Halaharvi with maximum dispensing time was 12900 sec (215 min) and PHC Bandi atmakur with minimum dispensing time was 16240 sec (104 min).

Average drugs prescribed for 50 patients from each PHC were 88.7. Maximum of 116 drugs were prescribed from Velapanur and Gudur PHCs and minimum of 74 drugs from Sanjamala PHC.

Average drugs dispensed for 50 patients from each PHC was 80.3, maximum drugs dispensed from Velpanur PHC was 116 and minimum drugs from Bandi atmakur PHC 57. Average drugs adequately labelled were 59.9, maximum 91 drugs adequately labelled were dispensed from Gudur and minimum drugs 42 from Halaharvi PHC.

That standard treatment guidelines were absent in Holagunda, Gajulapalli, Nannur and Laddagiri. All

the PHCs included in the study sample had Essential medicines formulary and E-aushadhi. [Table 2]

Table 1: IRDP

S.No	PHC Name	% of prescription including antibiotics	% of prescription including Injections	% of Poly pharmacy prescription	% of Drugs prescribed by generic name	% of Drugs prescribed from essential medicine list of formulary	IRDP
1	Aspari	10 (33.33)	11 (36.67)	5 (16.67)	30 (100)	30 (100)	3.76
2	Devanakonda	5 (16.67)	10 (33.33)	2 (6.66)	30 (100)	30 (100)	3.74
3	Gonegandla	15 (50)	4 (13.33)	2 (6.66)	30 (100)	30 (100)	3.80
4	Halaharvi	19 (63.33)	04 (13.33)	01 (3.33)	30 (100)	30 (100)	4.12
5	Holagunda	20(66.67)	05 (16.67)	03 (10)	30 (100)	30 (100)	3.35
6	Kosigi	18 (60)	05 (16.66)	03 (10)	30 (100)	30 (100)	3.40
7	Kowthalam	11 (36.67)	05 (16.67)	02 (6.66)	30 (100)	30 (100)	3.87
8	C.Belagal	12(40)	07(23.33)	02(6.66)	30(100)	30(100)	3.63
9	Gudur	14(46.67)	06 (20)	09 (30)	30 (100)	30 (100)	3.24
10	Kallur	09 (30)	11(36.67)	02 (6.66)	30 (100)	30 (100)	3.72
11	Laddagiri	14 (46.66)	05 (16.67)	07 (23.33)	30 (100)	30 (100)	3.36
12	Nannur	15 (50)	10(33.33)	3 (10)	30 (100)	30 (100)	3.20
13	Peapully	09 (30)	10(33.33)	03 (10)	30 (100)	30 (100)	3.6
14	Ullindakonda	16(53.33)	04(13.33)	0 (00)	30 (100)	30 (100)	4.31
15	Bandi atmakur	08(26.66)	08(26.66)	01 (3.33)	30 (100)	30 (100)	4.27
16	Bethamcherla	09 (30)	07(23.33)	02 (6.66)	30 (100)	30 (100)	3.88
17	Gajulapalli	16(53.33)	05(16.67	0 (00)	30(100)	30 (100)	4.15
18	Kottalacheruvu	06 (20)	13(43.33)	01(3.33)	30(100)	30(100)	4.13
19	Sanjamala	09(30)	03 (10)	02(6.67)	30(100)	30(100)	4.44
20	Velpanur	10(33.33)	10(33.33)	08(26.67)	30(100)	30(100)	3.30

Table 2: Indicators of Rational drug use

S.NO	Indicator	Observed	Total	Percentage
1	**Prescribing Indicators**			
i	Medicines Prescribed by Generic Name	600	600	100
ii	Non-Poly-Pharmacy Prescriptions	542	600	90.33
iii	Encounters with an Antibiotic Prescribed	245	600	40.83
iv	Encounters with an Injection Prescribed	143	600	23.83
v	Medicines prescribed from Essential medicine list	600	600	100
2	**Patient care indicators**			
i	Medicines actually dispensed	1606	1774	90.53
ii	Medicines adequately labelled	1198	1774	67.5
iii	Correct Knowledge of Dosage	556	600	92.67
3	**Facility Indicators**			
i	Availability of essential medicine list or formulary	20	20	100
ii	Availability of Standard treatment guidelines	16	20	80
iii	Percentage of availability of key indicator medicines	11	20	55
iv	Availability of E-aushadi portal	20	20	100

DISCUSSION

Prescriber Indicators

1. Average number of drugs per encounter

The average number of drugs prescribed is an important indicator of prescription appraisal. WHO recommended limit of drugs per prescription were 2.0. In the current study the average number of medications prescribed was 2.96, this value was high as compared to WHO recommended average number of drugs per encounter.

Poly pharmacy means prescription contains more than 5 drugs. In the current study polypharmacy was 57(9.5%) in over all 20 PHC of Kurnool.

Similar results were found in a study conducted by Karande et al,[11] in Mumbai 2005, 2.9 drugs were prescribed per prescription.

2. Percentage of drugs prescribed by generic name

The Purpose was to measure the tendency to prescribe by generic name. WHO,[12] encourages the use of generic analogue of drugs, as they are cheaper than branded substitutes and have equal potency.

In the current study it was observed that, total percentage of drugs prescribed by using generic name was found to be 100%.

Contrary to the present study, a study conducted in West Bengal by Hazra A et al,[13] revealed, very low 46.2 % of drugs prescribed using generic name.

3. Percentage of encounters with prescribed an antibiotic

Prescriptions with more antibiotics show that there may be an injudicious use of antibiotics for common illnesses in the study area. Antibiotics were prescribed in about 40.83% of the prescription. Another study conducted in a small Indian hospital, showed that more than 80% of all admitted patients received antimicrobial drugs such as penicillin, gentamicin, co-trimoxazole, ciprofloxacin, and metronidazole, and all antimicrobial drugs were

given empirically with no confirmation of the infective agent.[14]

In a study conducted in urban health centres of Kurnool, India 2016 by Cynthia et al ,[15] revealed that, 52.5% of the prescriptions had an antibiotic which is higher than current study.

Contrary to the present study, studies conducted in India by DIMIRI et al,[16] Siddharth V et al,[17] revealed that prescription with antibiotics were 29% and 22.8% respectively.

4. Percentage of encounters prescribed with injection

Inappropriate use of injections is another aspect of irrational drug use. Between 36% and 48% of patients encounter injections in Uganda, Sudan and Nigeria.[18]

From the current study it was observed that, prescribing of injections were 23.83%, which does not fell within the WHO recommend range less than 10%. On average 7.15 prescriptions were encountered with injections in each PHC, maximum 13 injections were encountered in Kottalacheruvu PHC and minimum 3 injections were encountered in Sanjamala PHC.

In contrast to present study, a study conducted in West Bengal by Hazra A et al,[13] only 3.9%% of injections were prescribed.

5. Percentage of drugs prescribed from essential drugs list or formulary

Purpose is to measure the degree to which practices conform to a national drug policy, as indicated by prescribing from the national essential drugs list or formulary.

In the current study it was observed that, 100% of drugs prescribed from essential drugs list or formulary.

In contrary to the present study, a study conducted by Hazra A et al,[13] in West Bengal revealed that, only 45.7% of prescribed drugs conformed to the WHO model list of essential drugs.

a. Patient care indicators

6. Average consultation time

The quality of care provided to patients was assessed by examining the consulting practices of doctors.

In the present study it was observed that, average Consultation time was 3.07min. Average consultation time for each PHC was 92.2min, 117 min maximum consultation time spending in Gajulapalli PHC and 73 min minimum consultation time in Kosigi PHC.

Similar results found in a study conducted in West Bengal, India by Hazra A et al 13revealed, the average consultation time was 3.7min.

7. Average drug dispensing time

The current study revealed, the average time taken to dispense the prescribed drugs was 299.4 sec (SD = 123). Majority of the respondents 347(57.33) were said that, the time taken to dispense the prescribed drugs was in between 181- 300 sec, followed by 182 (30.33%) within 180 sec, and 71(11.84%) between 301- 600sec

Contrary to the present study, a study conducted in Ethiopia by Nimbagiri Swamy Thiruthopu et al revealed, 19 9- 12 min time was taken to dispense the prescribed drugs.

8. Percentage of drugs actually dispensed

Total drugs prescribed were 1774 (100%), out of this they dispensed completely only 1235 (69.62%) drugs. Drugs were dispensed incompletely 371(20.91%), 168 (9.47%) drugs were not dispensed.

Contrary to the present study, a study conducted in West Bengal by Hazra A et al,[13] revealed, only 11.6% of drugs were dispensed.

10. Patient's knowledge of correct drugs dosage

Current study revealed that, out of 600 respondents, 92.67% respondents were had the correct knowledge about the drug dosage; Average patients had the correct knowledge about drugs 27.8, highest patients had correct knowledge from Bandi atmakur, Peapully, Nannur, Laddagiri, C. Belagal and lowest 22 patients from Velpanur.

Contrary to the present stud, a study conducted in West Bengal by Hazra A et al,[13] revealed, 64.5% of patients were had the correct knowledge about dispensed drugs dosage.

12. Availability of standard treatment guidelines

Current study was observed that, 16 (80%) PHCs had standard treatment guidelines.

Study conducted on evaluation of availability, accessibility and prescribing pattern of medicines in the Islamic Republic of Iran by Cheraghali A M et al,[20] revealed, availability of standard treatment guidelines was 91%.

Contrary to the present study, a study on use of drugs at the primary health care level in Bangladesh 1994 by Guyon A.B et al,[21] revealed, availability of standard treatment guidelines was 41%.

13. Availability of key drugs

To measure the availability at health facilities of key drugs recommended

for the treatment of some common health problems.

In the current study it was observed that, 55% of PHCs had all key drugs.

Contrary to present study, a study conducted on drug utilization pattern in South Indian paediatric population, Ethiopia 2014 by Nimbagiri Swamy Thiruthopu et al,[19] revealed, % of availability of key drugs were 79.65%.

CONCLUSION

- It was found in the present study that the prescription practices don't conform to the stipulated guidelines in majority of cases, especially use of antibiotics.
- Present study revealed excessive use of injections in some PHCs.
- In the current study, more drugs didn’t have label indicating the manufacture date and expiry date.

- In this study, dispensing time was more compared with WHO guidelines.
- It was found in the present study that all prescribed drugs were not dispensed.

RECOMMENDATIONS

- It was found in the present study that, prescription practices don't conform to the stipulated guidelines in majority of cases, especially use of antibiotics and injections. Hence there is a need to train the health care providers about the rational use of injections and antibiotics.

Limitations

- The prescribers were aware about the study, which could have biased the prescribing indicators in a socially desirable direction.
- The study was conducted in only one district i.e. Kurnool and hence it is not possible to generalize the findings to other districts of Andhra Pradesh.

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