

Assessment of Prescription Pattern in Paediatric Patients Using WHO Indicators

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ABSTRACT

Irrational drug prescription leads to ineffective treatment, occurrence of adverse effects, prolonged duration of illness and suffering to patient, and an increased economic burden to society. Since children are more vulnerable than adults, it is crucial that principles of rational prescription are strictly adhered to. A prospective, observational study was conducted in department of Pediatrics for a period of 2 months. The main objective of the study is to assess prescribing pattern among pediatric inpatients using WHO prescribing indicators. A total of 100 inpatients aged 1-12 years were enrolled. Majority of them were male (71 %). The most commonly prescribed drugs were Antimicrobials (22.7%), antiemetic and antiulcer (15.3% each) and analgesics (14.5%). Average number of drugs per encounter was 6.54. Percentage of antibiotics prescribed was 22.7, inject tables prescribed were 73.8. Drugs prescribed in generic names and from EML were 8.56 and 77.5 % respectively. The findings of this study reveal that drug utilization pattern was not optimal in accordance with the standard values of WHO prescribing patterns. Although, usage of antibiotics was in compliance to WHO recommended standards, there is a need to improve prescription pattern by generic name and drugs from Essential Drug List.

Keywords: Prescription pattern, WHO indicators, Essential Drug List, Poly pharmacy

INTRODUCTION

The quality of prescribing medications is major determinant and plays crucial role in providing good health care and in the treatment of serious health conditions. Children comprise 40% of India's population. Drug therapy is considered to be main element of pediatrics health care management. Infants and children are especially vulnerable to contact illnesses and to the harmful effect of drugs due to differences in pharmacodynamic and pharmacokinetic profiles. Drug use in paediatrics is not extensively researched and the range of licensed drug in appropriate dosage form is limited when compared to adult medicine.^[1]

In 1985, World Health Organization (WHO) defined that 'Rational use of drugs requires patients receive medications appropriate to their clinical needs, in doses that meet their own individual requirement for an adequate period of time and at the lowest cost to them and their community'.^[2] It is crucial that principles of rational prescription are adhered to and an important step towards this is by prescribing drugs only published in Essential Medicines List (EML). The use of antimicrobial agents, especially antibiotics became more routine practice for the treatment of illness and irrational use of antibiotics may lead to worsen the illness and infections.^[3]

The major problems of present day medical practice include over or under use of medication, high cost of drugs, more usage of injectables and antibiotics, polypharmacy, violation of standard treatment guidelines, usage of brands instead of generic names. The consequences of these lead to ineffective treatment, development of resistance to antibiotics, adverse effects and economic burden on patients. Influence of mentors, pharmaceutical sales representatives and patient characteristics are the determinants of prescribing habits.^[4]

A study of prescription patterns is an important tool to determine rational drug therapy and maximize utilization of resources. To improve the overall drug use, especially in developing countries, international agencies like the World Health Organization (WHO) and the International Network for the Rational Use of Drugs (INRUD) have developed a set of drug prescribing indicators.^[2] The indicators can be quickly and efficiently used in many settings to assess potential problems in drug use and to prioritize and focus for sequent efforts to correct these problems. The prescribing indicators are useful in identifying problems in general prescribing. They include the following:

1. Average number of drugs per prescription: To measure the degree of polypharmacy
2. Percentage of drugs prescribed by generic names: To measure the cost-effectiveness to procure and use drugs.
3. Percentage of prescription with an injection prescribed: To measure the general level of overused and costly forms of injectable drug therapy
4. Percentage of prescription with an antibiotic prescribed: To measure the level of misuse of antibiotics.
5. Percentage of drugs prescribed from essential drug list (EDL): To measure the degree to which practices conform to a national drug policy as indicated in essential drug list.^[5]

METHODOLOGY

The study was conducted at a pediatric hospital, Hanamkonda for a period of 2 months. 100 patients admitted in pediatric department were enrolled in the study. Patients above 12yrs were excluded. Prescribing pattern was assessed using WHO prescribing indicators, which was calculated using below formulae.^[6]

1. Average number of drugs per encounter = $\frac{\text{Total number of drugs prescribed}}{\text{Total number of encounters sampled}}$. (Combinations of drugs prescribed for one health problem were counted as one).
2. Percentage of drugs prescribed by generic name = $\frac{\text{Number of drugs prescribed by generic name}}{\text{Total number of drugs prescribed}} \times 100$.
3. Percentage of encounters with an antibiotic prescribed = $\frac{\text{Number of patient encounters with an antibiotic}}{\text{Total number of encounters sampled}} \times 100$.
4. Percentage of encounters with an injection prescribed = $\frac{\text{Number of patient encounters with an injection prescribed}}{\text{Total number of encounters sampled}} \times 100$.
5. Percentage of drugs prescribed from essential drugs list = $\frac{\text{Number of drugs prescribed from essential drugs list}}{\text{Total number of prescribed drugs}} \times 100$.

RESULTS

Of 100 patients admitted in the paediatric department, 71 % were male and 29 % were female. In our study patients were divided into 6 groups based on age. Majority of the patients were in the age group 0-1 year (39%) followed by 2-3 years (32%) and were diagnosed with acute GE with dehydration (28%) followed by LRTI (17 %). A total of 654 drugs were prescribed. Among them commonly prescribed drugs were antibiotics (22.7%), antiulcer (15.29%) and antiemetics (15.29%). Of the 149 antibiotics prescribed cephalosporins (53.02%) were frequently

prescribed followed by penicillins (17.44%) and quinolones (10.06%). Prescription pattern was assessed using WHO prescribing indicators. An average of 6.54 drugs was prescribed per patient.

Percentages of drugs prescribed by generic name and from EML were 8.56, and 77.5 respectively. Of the 654 drugs 73.087 % were prescribed in injection form.

TABLE 1: Diagnosis pattern in different age groups :

S.No	Disease	Age (in years)						Total
		0-1	2-3	4-5	6-7	8-9	10-12	
1	Acute GE with dehydration	11	12	3	-	-	2	28
2	Acute gastritis	2	3	3	-	1	2	11
3	Febrile seizures	3	7	2	-	1	-	13
4	Viral pyrexia	6	1	3	-	2	2	14
5	LRTI	7	7	1	-	-	2	17
6	Abdominal TB	-	-	-	-	-	2	2
7	Meningitis	2	-	-	-	-	-	2
8	Sepsis	4	1	2	-	-	-	7
9	Cellulitis	1	-	-	-	-	-	1
10	Inguinal hernia	1	1	1	-	-	-	3
11	ARDS with multiorgan failure	2	-	-	-	-	-	2
		39	32	15		4	10	100

TABLE 2: Commonly prescribed class of drugs :

Drug class	No. of drugs	%
Antibiotics	149	22.7
Antipyretics and analgesics	95	14.5
Expectorants and bronchodilators	41	6.26
Antihistamines	12	1.83
Antiulcer	100	15.29
Antiemetic	100	15.29
Antiepileptics	18	2.75
Steroids	10	1.52
Others	130	19.87

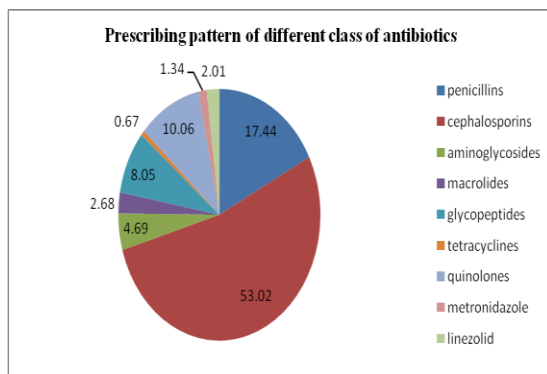


FIGURE 1: Classification of antibiotics

TABLE 3: Dosage forms of prescribed drugs:

Dosage forms	No. of drugs	%
Injectables	478	73.08
Tablets	5	0.7
Capsules	4	0.6
Syrups	154	23.54
Nebulisers	13	1.99

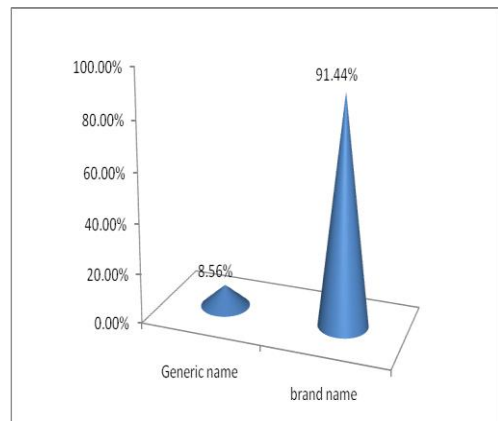


FIGURE 2: Drugs prescribed by generic name

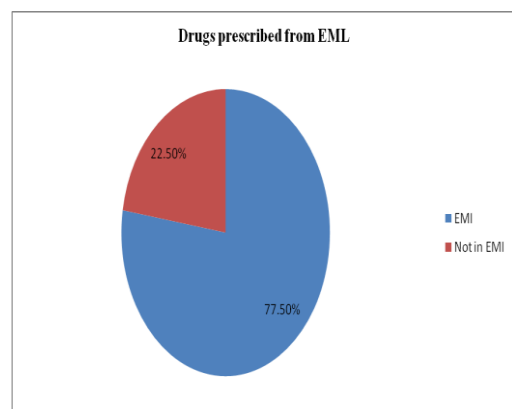


FIGURE 3: Drugs prescribed from EML

TABLE 4: Prescribing indicators:

Prescribing indicators	No. of drugs	%	WHO Standards
Average number of drugs per encounter	6.54	-	1.6 – 1.8
Prescriptions with injection drugs prescribed	478	73.08	13.4% - 24.1%
Prescriptions with antibiotics prescribed	149	22.7	20% - 26.8%
Drugs prescribed by generic name	56	8.56	100%
Drugs included in EML	507	77.5	100%

DISCUSSION

In our study the total percentage of male patients was comparatively more (71 %) than that of female patients (29%) which was similar to the study conducted by B.Vinoly Jeevan *et al*, 2017.^[7] Age distribution shows the peak incidence ranged between age group 0-3 yrs (71 %) same was observed by Venkateswaramurthy N. *et al*, 2017.^[8] This may be due to higher susceptibility of infections at a younger age. Most commonly prescribed drugs were antibiotics (22.7%) followed by antiulcer, antiemetics (15.3 % each) and NSAID's (14.5%). Similar observations were made by Venkateswaramurthy N. *et al*,^[8] 2017 In the present study we observed that Cephalosporin's groups of antibiotics are most commonly prescribed followed by Penicillins, which was similar to the observations made by B.Vinoly Jeevan *et al*, 2107.^[7]

Analysis of routes of drug administration revealed that 478 drugs were injectables (73.08%) followed by syrups (154%) which is comparable to the study conducted by Vishwanath *et al*, 2014.^[9] Among disease data, diseases of gastrointestinal tract (39%) were the most commonly seen followed by LRTI (17%). The burden in India is relatively great and expected to increase further which could be due to multiple factors like high levels of pollution, use of indoor fuels, inadequate ventilation, overcrowding and infections.

In our study we observed that average number of drugs per encounter was 6.54 which closely match with the findings of the study previously done by Palikhe *et al*.^[10] The reason for this could be due to the higher prevalence of co-morbid conditions. The WHO standard for average number of drugs prescribed per patient encounters is 1.6- 1.8. Rates higher than this standard are suggestive of polypharmacy, which can increase the risk of adverse drug interactions and non-adherence. The percentage of encounters with antibiotics was 22.7% which was in accordance with the

recommended standard of 20- 26%. Similar values were obtained in studies done by Thiruthopu *et al*.

Most of the medicines are prescribed using brand names and this pattern is common in our country. In our study only 8.56 % drugs were prescribed by generic name which was in contrary to the findings made by Sharma and Shweta, 2015^[11] and B.Vinoly Jeevan *et al*, 2017.^[7] This may be due to concerns about quality, safety of generic products and influence of marketing by pharmaceutical companies. Essential drug offers a cost-effective solution to many health problems in a developing country. They should be selected with due regard to disease prevalence, be affordability, assured quality and be available in the appropriate dosage forms. In our study, the percentage of drugs prescribed from the essential drugs list of WHO was 77.5% which was similar to the observation made by Sharma and Shweta, 2015.^[11] Percentage of drugs prescribed by generic name and from EML was lower than recommended ideal of 100%.

The use of inject tables for treatment is accompanied with a variety of disadvantages including infection at administration, increased risk of tissue toxicity from local irritation, expensive, difficulties in correcting the error. Thus WHO recommended 13.4%–24.1% prescription should include one or more inject tables, but the percentage observed in the present study was 73.8% which was found to be higher than standards. A study conducted by B.Vinoly Jeevan *et al*^[7] also reported increased use of parental. This may be due to high prevalence of diseases in younger age (<3 years), nature of the disease conditions that require parenteral interventions and to attain rapid relief from the diseases.

CONCLUSION

In our study we found that prescribing practice was not satisfactory, as it revealed that drug utilization pattern was not optimal in accordance with the standard

values of WHO prescribing patterns. Extent of poly pharmacy was observed to be much higher than the recommended values. It is well understood that for achieving the goal of rational use of medicines it is not only sufficient to choose the right medicines but also they must be employed in the most appropriate manner. Although usage of antibiotics comply with WHO recommended standards, there is need to improve prescription pattern by generic name and drugs from EDL. There is ample scope of improving prescribing pattern by prescribing number of medicines as low as possible in their generic name and from essential drug list. These are recognized measures that can considerably reduce the cost of the drugs to the patients. Periodic evaluation of prescribing pattern is needed to enable prescription of suitable medication to improve the therapeutic benefits and reduce the adverse effects. This study will act as feedback to the prescribers so as to create awareness about the rational use.

Abbreviations

WHO: World Health Organization
INRUD: International Network for the Rational Use of Drugs
EML/ EDL: Essential Medicines/ Drug List
NSAIDs: Non Steroidal Anti-Inflammatory Drugs
LRTI: Lower Respiratory Tract Infections
GE: Gastroenteritis
TB: Tuberculosis
ARDS: Acute Respiratory Distress Syndrome

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