Prescription Audit of Treatment of Diarrhoea and Pneumonia Amongst Paediatrician In Bhopal

Devendra Gour, Manju Toppo, Dinesh Kumar Pal, Harshima Sawlani, Shipra Verma, Akhil R. Nair, Sudarshan Kushwah
Department of Community Medicine, Gandhi Medical College, Bhopal, Madhya Pradesh, India

Abstract

Background: A prescription by a doctor may be taken as a reflection of physician’s attitude to the disease. Inappropriate prescription has always been a serious problem in developing countries. Objectives: The objective was to observe the current prescription practices for the management of diarrhea and pneumonia in Bhopal. Settings and Design: This was a cross-sectional study. Materials and Methods: The study was conducted at the clinics and hospitals of Bhopal over 4 months. The prescription of under-5 children with a diagnosis of acute respiratory tract infection and/or acute gastroenteritis attending the outpatient departments was included in the study. Data were recorded and analysis was done. Statistical Analysis Used: Epi Info was used for statistical analysis. Results: A total of 513 prescriptions of pneumonia and 417 of diarrhea were observed under the study. Among pneumonia, signs were mentioned on 15.6%, 74% as cold and cough with 95.5% prescriptions with antimicrobials. Seventy-three percent of diarrhea prescriptions did not mention any signs. Oral rehydration salt and zinc were prescribed in majority of the prescriptions along with around 64% use of antibiotics as well for the treatment of diarrhea. Conclusion: There is a huge need of improvement in prescribing patterns in areas of complete prescriptions with clinical features, follow-up advice along with rational choice of drugs with dose, and duration.

Keywords: Antibiotics, diarrhea, oral rehydration salt, pneumonia, prescription

INTRODUCTION

A prescription by a doctor may be taken as a reflection of physician’s attitude to the disease and the role of drug in its treatment. It also provides an insight into the nature of the health-care delivery system. Prescription writing is a science and an art, as it conveys the message from the prescriber to the patient. Infants and children are among the most vulnerable population groups to contract illnesses. The use of antimicrobial agents, especially antibiotics, has become a routine practice for the treatment of pediatric illnesses. However, there are also reports of an irrational use of antibiotics which may even lead to infections that are worse than the originally diagnosed ones. Irrational prescription of drugs is a common occurrence in clinical practice. In the medicine practice, there is a growing concern regarding the irrational prescription pattern and use of antibiotics.[1]

Globally, diarrhea continues to be a leading cause of morbidity and mortality in the pediatric population and causes 2.5 million deaths every year in children under 5.[2] Acute respiratory infections (ARI) are considered as one of the major public health problems and are the leading cause of morbidity and mortality in many developing countries. They have been estimated to cause 18%–33% of all deaths of children under 5 years.

Madhya Pradesh (MP) has the second highest under-5 mortality rate and highest infant mortality rate in the country.[3] Inappropriate prescription, especially for diarrhea and ARI, has always been a serious problem of the health care in the developing countries.[4] In MP, Zinc (Zn) and low osmolality oral rehydration salt (ORS) was introduced in 2009; in spite of this, the percentage of children who are treated with Zn and ORS is not satisfactory. The state guidelines[5] are often violated, and there are practitioners who do not usually follow the standard protocol.
It is necessary to define the prescribing pattern and to target the irrational prescribing habits for sending a remedial message.\[6\]

Thus, the study aimed to observe the current prescription practices for the management of diarrhea and pneumonia in Bhopal.

**Materials and Methods**

- **Study design** – Cross-sectional study
- **Study duration** – July–October 2017
- **Study area** – Clinics and hospitals of Bhopal
- **Inclusion criteria** – Under-5 children with diagnosis of acute respiratory tract infection and/or acute gastroenteritis attending the outpatient department (OPD) of clinics and hospitals of Bhopal city
- **Exclusion criteria** – Seriously ill children requiring indoor admission.

**Methodology**

One day orientation program of the data collectors and supervisors was held at Gandhi Medical College, Bhopal. The pediatricians who gave consent to participate in the study were listed out and randomly selected.

Data collection began from July 2017 covering all the selected pediatric practitioners. Each data collector was allotted 4–6 pediatricians who had given consent. He/she then approached the allotted pediatrician and collected the information on a predesigned pretested semi-structured data collection tool.

Data collection comprised of initial interaction with the practitioner and purpose of the visit. After the exit of the child from the clinic, audit of the prescriptions of the cases diagnosed with diarrhea and pneumonia was done including a snapshot of the prescription ensuring that the identity of the practitioner remains hidden. The information mentioned on the prescription was noted. This process was regularly monitored by the concerned supervisors from time to time. Thus, the data collector completed the desired number of prescriptions to be audited.

The data thus collected were compiled and entered in MS Excel and analyzed using Epi Info (Centers for Disease Control and Prevention, USA) Developed by: Centers for Disease Control and Prevention, USA. License: Apache License 2.0. Stable release: 7.2.2.6 / February 2, 2018.

**Results**

A total of 513 prescriptions of pneumonia and 417 prescriptions of diarrhea were observed under the study.

Out of 513 cases, 80 (15.6%) prescriptions had signs mentioned along with the diagnosis. Chest in drawing was mentioned only in 1.9% of prescriptions, whereas other signs such as fever and pallor were mentioned in 13.5% of prescriptions. Majority, i.e., 74% of prescriptions were classified as cold and cough, 17.4% of prescriptions were classified as pneumonia, and rest 8.6% were classified as other respiratory diseases, not included in the classification of pneumonia, i.e., asthma (0.4%), fever (7.6%), and bronchiolitis (0.6%). The majority of the drugs prescribed for the treatment of pneumonia were antimicrobials, i.e., 95.5%, followed by nonsteroidal anti-inflammatory drug (NSAID) which constitutes 62.5% [Figure 1]. Each class of drug has been prescribed multiple times by the practitioners. Most commonly prescribed respiratory drugs were antitussives (dextromethorphan), i.e., 15.2%, followed by bronchodilator (salbutamol) in 5.4% of prescriptions. For nebulization, budesal (levosalbutamol + budesonide) was prescribed more frequently. Only 0.7% and 0.6% of prescriptions were provided with the treatment and doses of drugs for the treatment as per the state government guidelines.

Table 1 and Figure 2 shows the observations made on the basis of the information mentioned on the prescriptions of children suffering from diarrhea. In majority of the cases (73.6%), signs were not mentioned and in almost all cases (>94%), treatment and doses were not according to guidelines.

Table 2 shows the prescribing indicators for diarrhea and pneumonia. A total of 513 prescriptions were audited for pneumonia. Majority of the prescriptions, i.e., 62.3% prescribed generic drugs, whereas only 5.1% of the prescriptions had branded drugs written on the prescriptions. This wide gap between the frequency of generic and branded drug prescriptions is because majority of prescriptions audited were from the government health facility where generic drugs are routinely prescribed and supplied from the hospital. It also displays that out of total drugs prescribed in the prescriptions of ARI, 48.4% of the drugs were prescribed by generic name, followed by 29.7% of drugs prescribed by branded names. Only 21.9% of drugs were prescribed as fixed dose combination.

Table 2 also shows that 417 prescriptions were audited for diarrhea. Majority of the prescriptions, i.e., 413 prescribed generic drugs, whereas 196 prescribed branded drugs on the prescriptions. The variation between the frequencies of generic and branded drugs is because majority of prescriptions were audited at the government health facility. Out of the total drugs prescribed in the prescriptions of diarrhea, 58.3% of drugs were prescribed by generic name, followed by 33.3% of drugs prescribed by branded names. Only 8.3% of drugs were prescribed as fixed dose combination.

**Discussion**

On considering the prescriptions of children suffering from pneumonia in our study, only 15.6% of prescriptions had mentioned signs along with the diagnosis, whereas the rest 84.4% did not mention it. In a similar study by Gawande et al.,\[7\] nearly half (46.8%) of the prescriptions were devoid of any signs symptoms. Our study reveals that majority, i.e., 74% of prescriptions were classified as cold and cough, whereas 17.4% of prescriptions were classified as pneumonia. In contrast to a study by Gawande et al.,\[7\] more than half (60%) of the prescriptions were devoid of any diagnosis at all. After a brief discussion with the practitioners, the principal reason mentioned was large number of patients to be examined in limited time and availability of suboptimal number of
system drugs prescribed in pediatric patients, bronchodilators were around 38% and nasal decongestants were around 45%. Among bronchodilators, salbutamol was around 40%, montelukast around 8%, Albuterol + ipratropium + salbutamol around 35%, theophylline + eotyline around 12%, and terbutaline were around 3%. In the present study, only 0.7% and 0.6% of prescriptions were provided with the treatment and doses of drugs for the treatment as per the guidelines. In a similar study by Sankhla et al., antimicrobials were observed in 26.3% and analgesics-antipyretics in around 20.9% of prescriptions. Devi et al.,[10] study conducted in 2015, found that adherence of government primary care hospital to the WHO guidelines was 83%. Similarly, in a study by Gawande et al.,[7] rational use of dose, duration and frequency of drugs for the treatment was found in around 93.1% of OPD cases. Reasons for nonadherence to the standard treatment guidelines were observed to be parents’ demand for injections and antibiotics as they think these lead to fast recovery of their children and monetary consideration on the part of prescribers. The majority of the drugs prescribed for nebulization were budesal (levosalbutamol + budesonide).

While considering the prescriptions of children suffering from diarrhea, only 74% of prescriptions had prescribed ORS, whereas a study conducted by Sontakke et al.[11] found 92% of prescriptions with ORS on it. Furthermore, another study conducted by Panchal et al.[12] had 99% of prescriptions with ORS, whereas a study conducted by Panchal et al.[13] had 95%, Jha et al.[13] had 89.7%, and Ogbo et al.[14] in Nigeria had 66% of prescriptions mentioning Zn on it. In the current study, 64% of prescriptions mentioned antibiotics, whereas a study conducted by Sontakke et al.[11] and Ogbo et al.[14] observed the mentioning of antibiotics to be 64% and 21.7% of prescriptions, respectively.

**Conclusion**

Auditing of prescriptions showed that there is a huge need of improvement in prescribing patterns in areas of complete prescriptions with clinical features, follow-up advice along with rational choice of drugs with dose, and duration. Interventions to rectify over prescription of antimicrobials are needed. There is a clear cut mismatch between recommendations and practical care in treating children with diarrhea and ARI in and around Bhopal. The excessive use of antibiotics puts a large
Table 2: Prescribing indicators

| Variables                        | Frequency (%) |
|----------------------------------|---------------|
| **Indicators for pneumonia (n=513)** |               |
| Total number of prescriptions    | 513 (100)     |
| Number of prescriptions with average two drugs | 247 (48.1) |
| Number of children coming for the first time | 493 (96.1) |
| Number of prescriptions with generic drug prescribed | 320 (62.3) |
| Number of prescriptions with branded drug prescribed | 26 (5.1) |
| Number of prescriptions with fixed dose combination | 128 (24.9) |
| Total number of prescriptions with more than one antibiotic | 13 (2.5) |
| Average number of drugs prescribed per prescription | 2 (-) |
| **Prescribing indicators-II**    |               |
| Types of drugs prescribed by generic names | 31 (48.4) |
| Types of drugs prescribed by branded names | 19 (29.7) |
| Types of drugs prescribed as fixed dose combinations | 14 (21.9) |

| **Indicators for diarrhea (n=417)** |               |
| Prescriptions with average three drugs | 152 (35.4) |
| Prescriptions with generic drugs prescribed | 413 (99.0) |
| Prescriptions with branded drugs prescribed | 196 (47.0) |
| Prescriptions with fixed dose combination | 19 (4.5) |
| Prescriptions with ORS | 331 (79.4) |
| Prescriptions with zinc | 328 (78.6) |
| Prescriptions with antibiotic | 267 (64.0) |
| Average number of drugs prescribed per prescription | 2.63 (-) |
| **Prescribing indicators-II**    |               |
| Drugs prescribed by generic names | 35 (58.4) |
| Drugs prescribed by brand names | 20 (33.3) |
| Drugs prescribed by fixed dose combination | 5 (8.3) |

ORS: Oral rehydration salt

financial burden on the poor household and the children also suffer from inappropriate prescribing, leading to the emergence of antibiotic-resistant microbes. The establishment and implementation of appropriate clinical guidelines/Standard operating procedures (SOP) for common ailments, use of essential medicines’ list, and regular update to clinicians in the form of Continuing medical education (CMEs) will help the implementation of rational use of drugs.

**Acknowledgment**

We are thankful to UNICEF for its full support and also to all the pediatricians for their cooperation during the study.

**Financial support and sponsorship**

The study was financially supported by the UNICEF, MP.

**Conflicts of interest**

There are no conflicts of interest.

**References**

1. Torvi JR, Damal S. Drug prescription pattern in paediatric outpatient clinic in a tertiary hospital. Curr Paed Res 2011;15:15,2(2011/07-2011/12).
2. Parashar UD, Breese JS, Glass RI. The global burden of diarrhoeal disease in children Bulletin of WHO 2003, 81.
3. National family health survey 4 report 2015-2016 from the graph page no. 187 figure 7.2 Under-five Mortality Rate by State/UT and table on 197 Table 7.4 Early childhood mortality rates by state/union territory.
4. Khan MO, Chowdhury AK, Matin MA, Begum K, Galib MA. Effect of standard treatment guidelines with or without prescription audit on prescribing for acute respiratory tract infection (ARI) and diarrhoea in some thana health complexes (THCs) of Bangladesh page 22 Bangladesh Med. Res. Coimc. Bull. 2007; 33: 21-30. Available from https://core.ac.uk/download/pdf/232728752.pdf. [Last accessed on 2020 Sep 24].
5. Available from: Standard treatment guideline http://www.health.mp.gov.in/sites/default/files/documents/STG-2016.pdf.s [Last accessed on 2020 Jun 17].
6. Yadavak SN. Drug use in medicine out-patient department: A prospective study in a tertiary care teaching hospital. B D M R council bulletin 2007: 33;21-30.
7. Gawande U, Deshmukh S, Kadam S, Potdar G, Salvitthal H. Prescription audit of patients attendees in public health facilities in Maharashtra, India with special reference to rational use of antibiotics. Int J Res Med Sci 2015;3:3655-64.
8. Venkateswaranmurthy N, Faisal ME, Sambathkumar R. Assessment of drug prescription pattern in paediatric patients. I J Pharm Sci Res 2017;9:81.
9. Sankhla S, Kanwar S, Mahawar DK. A retrospective study of prescribing pattern for acute respiratory infections in children in a tertiary care teaching hospital. Int J Pharm Sci Res 2017;8:3911-6.
10. Devi G, Rai J, Singh A, Singh K. Prescription audit for acute diarrhoea in children under five in tertiary, secondary and private care hospitals in Amritsar, Punjab. J Evolut Med Dent Sci 2015;4:8753-8.
11. Sontakke SD, Khadse V, Bokade CM, Motghare VM. Medication prescribing pattern in pediatric diarrhoea with focus on zinc supplements. Int J Nutr Pharmacol Neurol Dis 2016;6:152-6.
12. Panchal JR, Desai CK, Iyer GS, Patel PP, Diwshit RK. Prescribing pattern and appropriateness of drug treatment of diarrhoea in hospitalised children at a tertiary care hospital in India. Int J Med Public Health 2013;3 international journal of medicine and public health e published2013;3;4,335-341..
13. Jha L, Akhani S, Chatterjee P. Auditing the prescriptions of doctors in the management of acute diarrhoea in children under 5 years A hospital-based study. MedPulse Int J Pediatrics 2019;11:06-8.
14. Ogbo PU, Soremekun RO, Oyetunde OO, Aina BA. Prescribing practices in the management of childhood diarrhoea in primary health care centres in a sub-urban community in Nigeria. J Community Med Primary Health Care 2019;31:32-9.