Orignal

Prescribing pattern of drugs in pediatric wards of three Ethiopian hospitals

Teferra Abula, Zerusenay Desta

From the Department of Pharmacology, Gondar College of Medical Sciences, P.O. Box 196, Gondar, Ethiopia

Abstract: The 193/94 prescribing pattern of drugs in paediatric wards of three hospitals in North-west Ethiopia was reviewed retrospectively. A total of 158 medical records from Gondar (G) Hospital, 197 medical records from Bahirdar (BD) Hospital, and 177 medical records from Debre Tabor (DT) Hospital were randomly selected. The mean age of the patients was 4.4, 4.0, and 4.6 in G, BD and DT Hospital, respectively. The average admission diagnosis per patient was 1.6, 1.4 and 1.35 in G, BD, and DT Hospitals, respectively. Infectious diseases and malnutrition were the main causes of morbidity in all the three hospitals.

The average number of drugs prescribed per patient was four in G Hospital, 3.2 in BD Hospital, and 3.3 in DT Hospital. Antibiotics, particularly chloramphenicol and penicillin G were the most frequently prescribed individual drugs. In most cases the selection of the antibacterials was empirical.

Over prescription of analgesics/antipyretics was recorded in DT Hospital. The need for an establishment of antibiotic policy and prescription audit is discussed to enlighten on the rational use of drugs. [*Ethiop. J. Health Dev.* 1999;13(2):135-140]

Introduction

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 paediatric illnesses (1,2,3,4). The key role of antimicrobial agents for the treatment of infectious diseases that are prevalent everywhere in developing countries may not be denied.

However, there are also reports of an irrational use of antibiotics (5,6) which may even lead to infections that are worse than the originally diagnosed ones. The paediatricians and other medical personnel who provide health care for infants and children in developing countries confront a number of challenges during the day-to-day practice of medicine due to the shortage of appropriate drugs and other facilities.

Appropriate drug utilization studies have been found to be crucial to evaluate whether drugs are properly used and utilized in terms.

of medical, social, and economic aspects (7). Information about the utilization of drugs, particularly the prescribing pattern of drugs in hospitals and other health institutions of Ethiopia is scanty as yet.
The objective of the present study was to investigate the prescribing pattern of drugs for paediatric in-patients of three hospitals.

The results of the present study may contribute to

- describe and compare patterns of drug use at the various levels of health care system,

- look at the development of therapeutic profiles over a period of time and geography,

- make rough estimates of the number of patients exposed to various drugs and the drug-needs of the society based on the morbidity pattern,

- determine the benefit risk ratio and cost effectiveness of individual drugs, - indicate overuse, under use, and misuse of individual or therapeutic classes of drugs and,

- aid in the planning of drug selection, supply, distribution, and use of drugs.

Methods

The pattern of drug use and utilization was investigated in Gondar (G), Bahirdar (BD) and Debretabor (DT) Hospitals which are located in North-West Ethiopia and represent different types of care. According to the Ethiopian general health service classification, the selected hospitals represent referral-teaching, regional referral, and district hospital, respectively. The referral teaching hospital is better in terms of hospital facilities, including qualified staff than the other two hospitals. Medical records of paediatric in-patients of the three hospitals were reviewed retrospectively for the period of one year (September 1993 – August 1994). Every third (or fourth when the third case was incomplete) admitted case was randomly selected based on the registry book of the hospitals.

Accordingly, a total of 158 medical records of patients in G, 197 medical records of patients in BD, and 177 medical records of patients in DT hospitals were reviewed by trained medical doctors and nurses, with the assumption of getting a complete and reliable information.

Patient characteristics such as age, sex, body weight, living area, drugs taken before admission, duration of hospitalization, admission and discharge diagnosis, and the conditions of the patients on admission and discharge were recorded. Moreover, drug data, including name of the drug, dosage schedule (form, route, frequency and duration), and the date on which the pharmacotherapy was instituted, were recorded. Intravenous fluids, blood transfusion and nutritional preparations were not included in the study. Drug data and patient characteristic data were computed using EPI version 5.0 statistical package. The retrieved medical records contained most of the required information. But the body weight of the patients was not recorded in about 30% of the cases. **Results**

The annual admission of pediatric patients in Gondar Hospital was low as compared to the other hospitals, possibly due to the longest hospital stay of the patients in this hospital so that the turnover of hospital beds is also low.

The main demographic data (patient characteristics) of paediatric in-patients is shown in Table 1 where the mean ages of 4.6 in G, four in BD and 4.6 in DT hospital were found to be almost similar. In all the three hospitals, the number of male patients was more than that of the female patients, and the majority of the patients were from towns in which the hospitals are located.

A considerable percentage of patients (i.e., 36.7%) was exposed to herbal or modern medicines prior to their admission in hospital. The lowest number of cases of previous drug history (i.e., 8.2%) was recorded in DT hospital. The

average duration of the hospital stay was 24.9, 4.8, and 10.1 days in G, BD and DT hospitals, respectively.

The average number of admission-diagnosis per patient ranged between 1.6 in G hospital and 1.35 in DT hospital. The average number of diagnosis on discharge was almost similar to that on the admission of the patients in the corresponding hospitals. The diagnostic profiles of the paediatric in-patients are shown in Table 2. Accordingly, respiratory diseases gastrointestinal diseases, dermatological and other infectious diseases were the leading causes of morbidity common to all the three hospitals. Tuberculosis, diarrhoeal disease,

and bronchopneumonia were the most frequently recorded diagnoses in G, BD, and DT hospitals, respectively. A considerable percentage of patients (4.7%) in BD hospital had retroviral infections.

This diagnosis was taken from the medical records as it was written like all other diagnoses.

Table 3. shows the exposure of patients to drugs during the whole period of the hospital stay. The average number of drugs per patient was 4.00 ± 2.76 in G, 3.2 ± 1.8 in BD, and 3.3 ± 1.9 in DT hospital; more than 80% of the patients being exposed to, at least, two drugs.

The most frequently prescribed drugs are shown in Table 4. Antibiotics of penicillin group and chloramphenicol were the top-two most frequently prescribed drugs in all three hospitals. The presentation of specific diagnoses for which all drugs are prescribed or vise versa was not planned initially and is not shown in this paper.

A high percentage of patients, (80% in G, 79% in BD and 96% in DT hospitals) was prescribed, at least, one antibacterial drug.

Analgesic/antipyretic drugs were also prescribed more frequently, especially in DT hospital where about 58% of the patients were prescribed at least one analgesic/antipyretic drug. The commonly prescribed analgesic/ antipyretic drugs were paracetamol and dipyrone.

Discussion
The fact that the fate of infants and children is decided by parents or any other third party can have a negative impact on the provision of health care for them, the luckiest ones having a chance to come to health institutions.

We investigated the prescribing pattern of drugs in three hospitals which are located in North-west Ethiopia. Infectious diseases and malnutrition were the most frequently encountered diagnoses in all the three hospitals.

The impact of malnutrition on the health of children (8) and the predominance of infectious diseases, especially respiratory tract infections in paediatric inpatients, has also been reported by other authors (3,4,9). According to the diagnostic profiles, increased prescription frequency of anti-infective drugs is expected. The average number of drugs per patient in this study was similar to that which has been reported by other authors (1,9).

The increased consumption of drugs per patient in Gondar Hospital may be related to a long duration of the hospital stay as compared to the other hospitals. A smaller increase in the average number of diagnoses per patient in G hospital as compared to the others may also be a contributory factor. Penicillin G and chloramphenicol were the most frequently prescribed individual drugs.

Since the study was designed to obtain a generalized view of drug prescribing, attention was not given to tabulate specific indications for the prescribed drugs. Obviously, such data could provide reliable information about the rational or irrational use of individual drugs.

From the potentially serious adverse effects associated with the indiscriminate use of chloramphenicol, and a practice of empirical basis of prescription, the wide use of chloramphenicol may evoke some concern.

The prescription of antibacterials to more than 80% of the patients in our study, based on mainly clinical judgement, is in agreement with the previous studies; and increasing the habit of utilization of microbiological laboratories as a diagnostic aid and choice of therapy seems very crucial. The increasing use of antibiotics empirically (2), and the prescription of unnecessary antibiotics (6) has already been reported.

The fact that antibiotics can be obtained from drug vendors or pharmacies without prescription papers worsens the problem further. The roles of mothers of children and pharmacy workers in the selection of antibiotics for the paediatric patients was described (10).

Such a trend of prescribing and dispensing antibiotics by requests of the patient can be avoided by proper education of the patients (children) or their parents as well as drug vendors and pharmacy workers. The possibility of taking drugs without the knowledge of the physician in-patients is however, minimal.

The prescription of antituberculosis drugs in Gondar Hospital coincides well with the diagnostic profile as tuberculosis is one of the main diagnoses in this hospital.

INH – induced psychosis and hepatitis (not shown in results) – some of which occurred due to the administration of large doses-would at least, remind the health personnel to check the pediatric dosage at the time of drug administration. The habit of recording adverse drug reaction, which was inadequate so far, must be encouraged at all levels of health care institutions.

Although it requires an evaluation and agreement among pediatricians, the routine use of vitamin B_6 to prevent INH-induced peripheral neuritis is not necessarily recommended for paediatric patients (11). In view of earlier reports regarding the development of resistance to tetracyclines (12), and its severe adverse effects for children under the age of eight years (11), the decreased use of tetracyclines in this study seems rational.

Over-prescribing of analgesics/antipyretics seems to be a problem in DT hospital. When the condition demands the use of such group of drugs, it is preferable to use paracetamol rather than dipyrone as the former is equally effective but has minimal adverse effects as compared to the latter.

In conclusion, the prescription pattern of drugs in all paediatric wards was similar and seemed to depend mainly on the availability of the drugs rather than the preference of the prescribers.

In general, the high frequency of prescription of anti-infective drugs matches with the high prevalence of infectious diseases and the use of individual pharmacological classes of drugs seems to follow the diagnostic profile of the patients.

Moreover, there is no antibiotic prescribing policy and standard treatment protocol in the hospitals, and hence it is difficult to assess the physician's adherence to a given protocol.

Developing antibiotic policy and therapeutic guidelines with continued assessment of problems associated with resistance from time to time is essential to promote the rational use of antimicrobial agents.

The investigation of the rational use of individual drugs with consideration of the diagnostic profiles and demographic variables needs, however, further studies.

Acknowledgment

References

1.   Kafle KK, Khanal DP. Paediatric prescribing in in-patient care in Nepal. NEPAS souvenir 1993;1(1):125-130.

2.   Rashid HU, Chowdhury SAR, Islam N. Patterns of antibiotic use in two teaching hospitals. Trop Doct 1986;16:152-154.

3.   Sanz EJ, Bergman U, Dahlstorm M. Paediatric drug prescribing. Eur J clin pharmacol 1989;37(1):65-68.

4.   Summers RS, Summers B. Drug prescribing in paediatrics. Ann Trop paediatr 1986;6:129-133 .

5.   Principi N, et al. Control of antibiotic therapy in paediatric patients. Developmental pharmacology and therapeutics 1981;2(3):145-155.

6.   Schollenberg E, Albritton WL. Antibiotic misuse in a paediatric teaching hospital. Can Med Assoc J 1980;122(1):49-52.

7.   Bergmann U, Grimsson A, et al, eds. Studies in drug utilization: methods and application. WHO Regional publications. Euro Ser No 8 WHO Regional Office for Europe. WHO, Copenhagen, 1979.

8.   Schorling JB, Malnutrition is associated with increased diarrhoea incidence and duration among children in an urban Brazilian slum. Int. J Epidemiol 1990;19:728-735.

9.   Nhachi CF, Kasilo OM, Nathoo S. Drug prescribing in paediatric in-patients at Harare and parirenyatwa central hospitals. Centr. Afr. J Med 1992;38:57-62.

10.   Schorling JB, de Souza MA, Guerrant RL. Patterns of antibiotic use in an urban Brazilian slum. Int J Epidemiol. 1991;20:293-299.

11.   WHO. Drugs for children, WHO, Regional office for Europe. WHO, Copenhagen, 1987.

12.   Assefa A. Yohannes G./ Antibiotic sensitivity patterns of prevalent bacterial pathogens in Gondar, Ethiopia E.Afri Med J 1996;73:69-73.

Table 1**. Paediatric in – patient characteristics in G (n=158), BD (n=197) and DT (n=177)**

Parameter	G	BD	DT
	N %	N %	N %
Age:(meant $\pm$ SD years	4.6 $\pm$ 4.1	4 $\pm$ 4.1	4.56 $\pm$ 4.06
Sex:	98(62.0)	114(57.9)	102(32.9)
Male	60(38.0)	83(42.1)	74(42.0)
Female			
Living area:	98(62.0)	150(76.1)	118(62.1)
Urban	60(38.00	47(23.9)	66(37.9)
Rural			
Cases with PDH	58(36.7)	36(18.5)	14(8.2)
Hospital stay (days)	24.9 $\pm$ 28.9	4.8 $\pm$ 6.1	10.1 $\pm$ 8
Diagnosis /patient	1.6	1.4	1.35
Admission	1.7	1.5	1.4
Discharge			

* PHD previous drug history

Table 2. **Top-10 diagnoses in G, BD and DT Hospital**

G (n=271)	BD (n=299)	DT(n=245)
Diagnosis %	Diagnosis %	Diagnosis %
1. Tuberculosis (12.9)	Diarrheal diseases (17.4)	Bronchopneumonia (25.5)
2. Diarrheal dis. (10.7)	Bronchopneumonia (15.4)	Diarrheal diseases (9.8)
3. Bronchopneumonia (10)	Malaria (8.4)	Kwashiorkor (9.8)
4. Parasistosis (6.3)	Tuberculosis (8.1)	Malaria (6.9)

5.Marasumus (5.2)   RVI (4.7)   Marasmus (5.7)

6. Anemia (4.8)   Anemia (4.0)   Burns & STI (5.7)

7. Skin infection (4.8)   Asthma (3.3)   Parasitosis (4.9)

8.Kwashiorkor (4.4)   Kwashiorkor (3.3)   Meningitis (4.9)

9. Burn & STI (3.3)   Sepsis (3.3)   Nephritis (3.7)

10. CHF (2.6)   Meningitis 3.0   CHF (3.3)

STI = Soft tissue injury; RVI= Retroviral infection; CHF= Congestive heart failure.

Table 3**. Paediatric In-patients' exposure to drugs in G(n=158), and BD(n=197) and DT (n=177)**

Drugs/patient	G	BD	DT
No drug	10(6.0)	3(1.5)	1(0.6)
One	19(12.0)	31(15.7)	23 (13.0)
Two	21(13.3)	53(26.9)	44 (24.9)
Three	31(19.9)	38(19.3)	50(28.2)
Four	21(13.5)	25(12.7)	20(11.3)
Five	14(8.9)	26(13.2)	16(9.2)
Six	13(8.2)	10(5.1)	14(7.9)
Seven	12(7.6)	8(4.1)	6(3.4)
Eight	7(4.4)	2(1.0)	1(0.6)
Nine	4(2.5)	1(0.5)	1(0.6)
Ten	3(1.9)		
>Ten	3 (1.9)		
Range:	0– 16	0 – 10	0 – 15
Mean $\pm$ SD	4 $\pm$ 2.8	3.2 + 1.8	3.3 ± 3.3 ± 1.9

Table 4: **The most commonly prescribed individual drugs in GH (freq=634) BDH (freq=622) and DTH (freq= 574) paediatric in – patients**

GH	BDH	DTH
Drugs n %	Drugs n %	Drugs n %
1. Penicillin 85(13.4)	Chloramphenicol 76 (12.7)	Chloramphenicol 68(11.8)
2. Chloramphenicol 54 (8.5)	Ampicillin 66(10.6)	Penicilline G 68(11.8)
3. INH + TB 450 49(7.7)	Penicillin G 59(9.5)	Cotrimoxazole 54(9.4)
4. Cotrimoxazole 48(7.6)	KCI 55(8.8)	Ampicillin 48(8.3)
5. Streptomycin 39(6.2)	ORS 33 (5.3)	Dipyrone 42 (7.3)
6.Gentamycin 38(6.0)	Frusomide 30(4.8)	Paracetamol 34 (5.9)
7. Iron Sulphate 34(5.4)	Multivitamins 30(4.8)	Gentamycin 23 (4.0)
8. Vitamin B_6 31(4.9)	Chloroquine 24(3.9)	Metronidazole 15 (2.6)
9. Paracetamol 30(4.7)	Gentamycin 21(3.4)	Treupel 15(2.6)
10. Mebendazole 18(2,8)	Aminophylline 21(3.4)	Frusomide 14 (2.4)
11. Others 206(33.4)	Others 204(32.8)	Other 193(30.4)