ORIGINAL ARTICLE

PATTERNS OF DRUG UTILIZATION IN INPATIENT DEPARTMENTS, JIMMA HOSPITAL SOUTH WEST ETHIOPIA

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ABSTRACT

BACKGROUND: ***Inappropriate use of drugs adversely affects health care systems in general and patients in particular. Misuse and abuse of drugs are common public health problems in both developed and developing countries. Studies have been conducted to assess the patterns of drug utilization in different set-up. The aim of the study was to assess the pattern of drug utilization in inpatient departments of paediatrics and internal medicine at Jimma hospital.***

METHODS: ***A prospective study was conducted between April 01 and May 30, 2002. Structured format was used to collect data from patients or caretakers and from their records. Follow up was done on a regular basis from the day of admission to the day of discharge and the average period of follow up period was 2weeks.***

RESULTS: ***A total of 80 patients were included in the study. The common causes of hospital admissions were tuberculosis (in adults) and severe pneumonia (in children). A total of 251 drugs were prescribed in both paediatrics and medical wards. Antimicrobials, vitamin's and minerals and CNS acting drugs were among the most frequently prescribed agents. Crystalline penicillin was the most frequently used antimicrobial. Thirty seven percent (13) of adult and 43 % (18) of paediatric patients took combinations of drugs. The average number of drugs used per patient was 2.9 and 3.5 for children and adults respectively. The maximum number of drugs used per patient was eight. Twenty four percent (59) of the prescription was inappropriate. In five percent (14) of the prescriptions, the dose was above or below the recommended dose. In 23 % (20) the prescriptions, there was no information pertaining to drug dose. The route, interval and duration of administration were correctly written in 58% (77), 77 % (92), and 53 % (55) of the prescriptions respectively.***

CONCLUSION: ***Inappropriate use of drugs is a problem even in a teaching hospital. Preparation of treatment protocols, guidelines, and formulary is required to minimise the risk of irrational drug use. Continuing medical education on the management of widespread diseases is mandatory to reduce the risk of inappropriate use of drugs.***

KEY WORDS: ***Drug utilization, inappropriate use of drugs, inpatient departments, drug prescription.***

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INTRODUCTION

Proper drug utilization requires prescription of drugs on rational basis. Aggressive drug marketing promotions, lack of information on the use of drugs, and drug shortages are the major causes of irrational drug use [1]. The rational use of drugs demands prescription of appropriate drugs; availability of drugs at the right time, at a price people can afford, that it be dispensed correctly and that it be taken in the right dose at the right intervals and for the right length of time [2]. Irrational drug use is a common practice in developing countries. In India, a baseline hospital survey showed that poly-pharmacy was common, in both inpatient and outpatient departments. The use of antibiotics and injections was higher in inpatients compared to outpatients [3]. The study revealed the picture of drug utilisation pattern in a teaching hospital; however, all parameters of rational drug use were not included. So, it is difficult to conclude whether drugs were used rationally or irrationally based on such study.

A retrospective study on the prescription patterns of analgesics in 13 rural and regional hospital demonstrated that analgesics were prescribed almost for every patient in the study hospitals, showing that there was no a clear therapeutic guideline for prescribing analgesics [4].

A drug use study in eight southern Ethiopia hospitals indicating that the practice of poly-pharmacy, overuse of antibiotics and injections were widespread [5, 6]. The survey revealed that acquired habits, patient's demand, lack of drug information, and peer norms were the major underlying factors for irrational prescribing. The study clearly demonstrated the patterns of drug utilisation in rural hospitals. However, the picture could be different in referral and teaching hospital, because the composition and qualification of technical staff and the financial capacity are not comparable.

A retrospective study on prescribing pattern of drugs in paediatric wards revealed that antibiotics, particularly chloramphenicol and penicillin G were most frequently prescribed drugs and in most cases the selection of the antimicrobials was empirical. In addition, over prescription of analgesics was also a common practice [7]. Irrational drug use could be due to lack of appropriate information on drugs, or therapeutic guidelines or treatment protocols for common clinical conditions. Furthermore, lack or shortage of drugs also predisposes to misuse of drugs. No study has been conducted to assess the type of irrational drug use and patterns of drug utilisation in inpatient departments, in a big health institution, like Jimma hospital. Thus, the aim of the present study was to assess the patterns of drug use of inpatient departments of Jimma teaching / referral hospital. The study will help in allocating adequate budget and for preparation of local therapeutic guidelines /treatment protocols for specific and common disease condition to avoid irrational drug use.

MATERIALS AND METHODS

This prospective study was conducted in Jimma hospital. The hospital serves as a teaching hospital for a variety of health professionals. All patients admitted to medical and paediatrics ward between April 01 / 2002 and May 30/2002 were eligible. Because of the limited category of drug use in surgery and gynaecology departments, patients admitted to those wards were not included in the study. Patients treated non-pharmacologically and patients who died before the initiation of drug treatment were excluded from this study. Patients were followed from time of admission to the time of discharge despite the duration of hospital stay and the treatment outcome.

Data Collection

Data was collected from patients or caretakers (for seriously ill patients and children), on inpatient cards and order sheets using structured format by the investigators. Patients' records were revised on a regular basis from the first day of admission. The last data was collected at the time of discharge. Data regarding age, gender, height, weight, date of admission and discharge, tentative and final diagnosis was collected from patients' records. Data concerning drug history and outcomes of drug treatment was collected either from the patient's chart or from the patients or caretakers depending on the completeness of the data. Indications of the drug, its dose, route, interval and duration of administration was collected from patients' chart. Treatment guidelines those commonly used in by the physicians in the department of Paediatrics and Child Health [8] and standard textbooks [9, 10] were used as a reference to evaluate the appropriateness of the prescription order.

Data analysis

SPSS 7.5 statistical package was used to analyse the data. Descriptive statistics was used to describe age, sex, diagnosis, patterns of drug utilisation, and treatment outcomes. Tables, Pie charts, Bar graphs, Histograms, line graphs will be used to present the data.

Ethical Consideration

Verbal consent was obtained from each patient before conducting the interview. Patients had the right to withdraw from the study. Hospital officials and the heads of respective departments were informed about the study prior to conducting the study.

RESULTS

Thirty-six adult and 44 paediatric patients' were admitted to Jimma hospital from April 01/2002 to May 30/ 2002. The median age was 22 months and the minimum and the maximum age was 1 month and 156 months respectively for paediatric patients. The median age for adults was 30 years the range was minimum and the maximum age was 18 and 62 years respectively. The male to female ratio was 1.3 and 2.1 for adult and paediatric patients respectively. Weight was recorded for 52.3 % (23) paediatric patients.

Tuberculosis 23 % (8), Diabetes Mellitus 17 % (6), and cardiac diseases 14 % (5) were the three common causes of medical admission during the study period (**Table 1**).

Table 1. Admission diagnosis in medical ward. April to May 2002, Jimma Hospital. (N = 35).

Initial diagnosis	Number	Percent
Tuberculosis	8	23
Diabetes Mellitus	6	17
Cardiac diseases	5	14
Others *	16	46

Others*: Include Chronic liver diseases, Acute glomerulonephritis, encephalitis, idiopathic thrombocytopenic purpura, lymphoma, meningitis, nephrotic syndrome, asthma, anaemia, seizure, shock and toxoplasmosis

Severe pneumonia 25% (11), protein energy malnutrition 18% (8), and severe malaria 14 % (6) were the common causes of hospital admission in paediatric age group (**Table 2**).

Table 2. Admission diagnosis of patients in paediatrics ward, April to May 2002, Jimma Hospital. (n = 44).

Initial diagnosis	Number	Percent
Severe Pneumonia	11	25
Protein energy malnutrition	8	18
Severe malaria	6	14
Others **	19	43

Others** Severe dehydration, Tuberculosis, asthma, relapsing fever, cellulites, neonatal sepsis, meningitis, and, idiopathic thrombocytopenic p (ITP).

Eighty six percent (36) of the patients admitted to the paediatrics ward got improved and discharged while 9 % (4) died. In the medical ward 62.9% (22) of the patients got improved and 25 % (9) died and the rest either discharge themselves or got worse.

A total of 251 drugs were prescribed in both paediatrics and medical wards during the study period. Antimicrobials, Vitamin's and Minerals and CNS acting drugs were most frequently prescribed by the physicians (**Table 3**).

Table 3. Type of drugs used and their rate of prescription during the study period, April 2002 -May 2002, Jimma hospital

Drug group	No of prescriptions	Percent
Antimicrobial	107	42.6
Anti-protozoal	17	6.7
CNS acting drugs	28	11.2
Diuretics	20	8
Vitamins & Minerals	29	11.5
Drugs acting on GIT	11	4.4
Endocrine drugs	10	4
IV fluids	16	6.4
Others**	13	5.2
Total	251	100

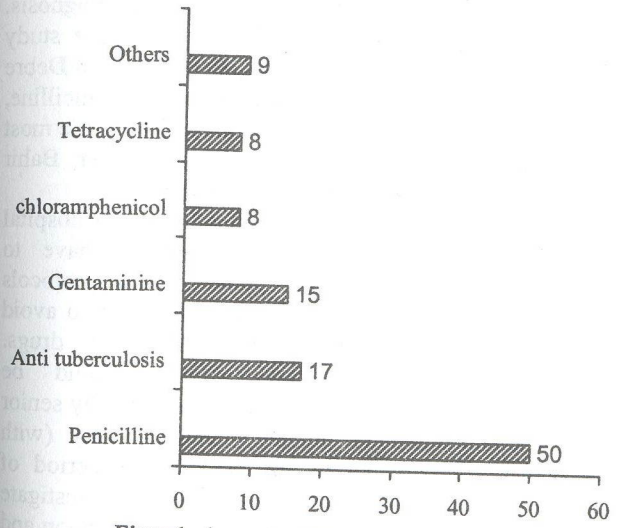
Others:** antihelimenths, CVS drugs and Bronchodilators.

Crystalline penicillin, gentamicine and ampicilline were the most commonly used antibiotics. Fursemide Vitamin A were frequently used diuretics and vitamins respectively (Table 4).

Table 4. The most frequently prescribed drugs both in paediatrics and medical wards, April to May 2002, Jimma hospital. (N = 251)

Drug	Number	Percent
Crystalline penicillin	32	13
Frusemide	18	7
Gentamicin	15	6
Vitamin A	11	4
Ampicilline	8	3
Others	167	67

Among antimicrobial drugs penicillin was the most frequently prescribed drug followed by antituberculosis drugs and gentamicine (**Fig. 1**).



Figur 1. shows patterns of antimaicrobials use in Jimma Hospital, May 2002 (N=107)

Forty three percent (18) of the paediatric patients took combinations of drugs and 2 (4.3%) were given no drug. The average number of drugs used per patient was 2.9 and the maximum number of drugs used per patient was seven. In the medical wards, 37 % (13) of the patients used combination of drugs. On average 3.5 drugs were used per patient and the maximum number of drugs used per patient was 8.

Regarding indication, 76 % (189) of the prescription were appropriate i.e. the right drug was ordered for the given disease conditions. Twenty four percent (59) of the order was inappropriate i.e. the drug has no neither beneficial effect nor clear indication for the given complaints. One (0.4 %) drug was prescribed although it was a contraindication for that given patient or disease conditions.

Data concerning drug dose was obtained for 35 % (87) of the prescriptions, of which 61 % (53) of the dose was appropriate (correct dose for the right patient or disease conditions), in 3.4 % (3) the dose was above the recommendation, and 12.6 % (11) of the prescriptions was

below the recommended dose. In twenty three percent (20) of the prescriptions, information concerning dose was incomplete (defined dose not recorded).

Data regarding route, frequency and duration of drug administration was found for 54 % (133), 54 % (133), and 42 % (104) of the prescriptions respectively. The route, interval and duration of administration were appropriate in 58% (77), 77 % (92), and 53 % (55) of the prescriptions respectively.

DISCUSSION

Weight record was not found for 48 % (21) of the paediatric patients who were admitted during the study period. Although age and body surface area are used to compute drug dose in children, weight is frequently used to calculate paediatric dose of commonly used antimicrobials [10]. Failure to take weight may lead to incorrect dose calculation, which is harmful to the patient.

This study showed that 24 % (59) of the prescription orders lack clear indications. Hence, relevant clinical evaluation and diagnostic investigations should be done before prescribing drugs to minimize unnecessary cost to the patient and to the country as well. Sixty five percent (161) of the order lack information concerning dose, which in turn could lead to under or over treatment of the patients.

Significant number of prescriptions lack information regarding the methods of drug administration, the interval of administration and the duration of treatment. These malpractices could result administration of drugs in the wrong route, unwanted shorter or longer interval of drug administration and incorrect duration of treatment.

Seven drugs (maximum) and 2.9 drugs on average were prescribed for stay. Relatively higher results have been obtained in a study conducted in Gonder, Bahir Dar and Debre Tabor hospitals, however a total of 158, 197, and 177 medical records were reviewed in Gonder, Bahir Dar and Debre Tabor hospitals respectively. [7]. Using less number of drugs is associated with good compliance, and relatively few side effects.

Antimicrobials in general and penicillin's in particular were the most frequently prescribed drugs in both departments. The prescription pattern closely related to the admission diagnosis. A similar result was obtained in a study conducted in Gonder, Bahir Dar and Debre Tabor Hospitals. Penicilline, chloramphenicol and TB 450 were the most widely prescribed drugs in Gonder, Bahir Dar and Debre Tabor Hospitals [7].

In conclusion, the university hospital and the relevant departments have to prepare treatment guidelines and protocols for specific and common diseases to avoid misuse of resources specially drugs. Prescriptions and orders should be regularly checked and supervised by senior physicians. Finally, detailed study (with larger sample size and longer period of time) should be conducted to investigate the root cause of irrational prescription and to find relevant solution for it.

ACKNOWLEDGEMENTS

The material and financial support for this study was secured from the research and publication office of Jimma University. Besides I extend my heart felt gratitude to the Jimma hospital officials, head nurses of the medical and paediatrics wards for their cooperation during the data collection.

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