

## Evaluation of Antibiotic Use in Medical Ward of Fitcha District Hospital, North Showa Zone, Oromia Region, Ethiopia

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### Abstract

**Background:** Antibiotic are among the most prescribed drug in medical ward. Because of the rise in health care cost lack of uniformity in drug prescribing and the emergency of antibiotic resistance monitoring and control of antibiotic use are growing concern and strict antibiotic policies should be warranted. Inappropriate use of antibiotic can increase morbidity, mortality, patient cost and bacterial antibiotic resistance.

**Objective:** To evaluate antibiotic use practice in medical ward of Fitcha hospital, North Showa Zone, Oromia region, Ethiopia.

**Methodology:** Institution based cross sectional study was conducted by collecting data retrospectively from 200 patient cards drawn by Simple random sampling using balloting from Medical ward of Fitcha hospital from March 10-May 30, 2016. After checking for completeness and consistency, data was entered in SPSS (IBM 20) and descriptive statistics was carried.

**Result:** Out of the total 200 patient cards, 110 (55%) were of male and 90 (45%) were of female. Most antibiotics were prescribed for empirical treatment 163 (81.5%) and least for prophylactic treatment 5 (2.5%). In this study, of the total 340 drugs prescribed in Medical ward, the prevalence of antibiotics use was 220 (64.7%). In this study, 65% received more than one antibiotic. And the most commonly prescribed groups of antibiotic were Cephalosporin 32.5% and the most commonly prescribed antibiotic was ceftriaxone 27.5%.

**Conclusion:** This study revealed that of the total of 340 drugs prescribed for 200 patients in Medical Ward of Fitcha District Hospital, 64.7% were antibiotics and the most commonly prescribed groups of antibiotic were Cephalosporin and the most commonly prescribed antibiotic was ceftriaxone. And majority of patients in Medical ward 65% received more than one antibiotic.

**Keywords:** Drug; Medical ward; Fitcha hospital; Antibiotics

### Introduction

Antibiotics are powerful medicines that fight bacterial infections. Used properly, antibiotics can save lives. They either kill bacteria or keep them from reproducing. Your body's natural defences can usually take it from there [1]. They are one of the pillars of modern medical care and play major role in prophylaxis and treatment of infectious disease. The issue of their availability, selection and proper use are of critical importance to the community antibiotic miser use: however, worldwide with the extent of the problem being greater in the developing countries, through their purchase in local pharmacies and drug stores and through inappropriate prescribing habit and an overzealous desire to treat every infection [2]. They are one of the most common drugs prescribed in hospital today. It has been estimated that up to third of all patients receive at least one antibiotic during hospitalization. The cost involved is there for correspondingly high and up to 40% of a hospital's drug expenditure may be devoted to the purchase of antibiotics [3,4]. Antimicrobial therapy is administered to 25% to 40% of hospital inpatient, and, in 50% of cases, is inadequate in terms of dosage, rout of administration, or indication Realities such as this strengthen the notion that rational and therefore adequate use of antimicrobial agents plays an essential role in insuring patient safety, particularly in the intensive care setting above all because antibiotic misuse fosters bacterial resistance and increasing the cost of health system [5-7].

In the past decade, there has been an alarming trend towards increase in antimicrobial resistance; there are different factors for the development of antimicrobial resistance: among these; human

pathogens, the overuse and inappropriate prescribing of broad spectrum antibiotics has been implicated [8-10]. In the hospital, use of antibiotic drug has been major concern in the last few decades for several reasons for the purchasers of health care service and administration. Antibiotics drugs account for a major proportions of the escalating drug budget. To a greater extent particularly in hospital, the overuse and misuse of antibiotic drug considered to be one of the reasons for increasing resistance among various photogenes: these worries have led to the implementation of strict antibiotic policies in hospital in many countries with different strategies and different outcomes.

Monitoring of drug use is essential in order to follow the effect and adherence to the hospital's antibiotic policies: patient medical record may be reviewed for this purpose. But this method can be quite exhaustive [10]. Excessive and inappropriate use of antibiotic is highly associated with the emergence of antibiotic resistance which presents major threat to global public health. Antibiotic resistance reduce the

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effectiveness of and number of option for antibiotic treatment, leading to increased morbidity, mortality, and health care expenditure [11,12]. Growing misuse of antibiotics has been reported in hospitals, causing toxic effects and various infections due to resistant microorganisms that increase the cost and duration of hospitalization. Increased cost of health care will definitely jeopardizes the capacity of the poor population to seek the modern health care. There is a pressing need to develop appropriate measures to curtail misuse of drugs in general and antibiotics in particular. Besides; a drug use in hospitals has a considerable influence on further drug use outside the hospitals [13].

Several strategies for controlling antibiotic usage have been proposed. Such as formulary replacement or restriction, introduction order form, health care provider education, feedback activates, and approval requirement from infectious disease specialist for drug prescription [14,15]. Drug Use Evaluation (DUE) is an ongoing systematic process designed to maintain the appropriate and effective use of drug. It incorporates qualitative measure and emphasizes outcome. Including pharmacoeconomics assessment. DUE can identify problem in drug use, reduce adverse drug reaction, optimize drug therapy and minimize drug related expense it often include intervention to ensure appropriate drug use [16]. Drug use evaluation focuses on the area that show greater potential for improvements. It involve on compressive review of patient prescription and medication data, during and after dispensing in order to ensure appropriate therapeutic decision making and promote positive outcome [17].

In Ethiopia, particularly in Fitch, there are no sound studies conducted about the evaluation of antibiotics use in hospital wards. Therefore, this study was designed to evaluate use of antibiotics in medical ward of Fitch hospital, North Showa Zone, Oromia region, Ethiopia.

## Methods and Materials

### Study are and period

The study was conducted in Fitch hospital North Showa Zone, Oromia region, which is found 115 km from Addis Ababa. Its total population is 27,493 in numbers of which 12, 933 are males and 14,560 are females. The town has many governmental and privet organization such as Government hospital and health center. Fitch hospital has different departments and wards like OPD, medical, gynecology, pediatrics, and surgical ward. And the study focused in Medical ward of the hospital. The study was conducted from March 10 to May 30, 2016.

### Study design

Institution based cross sectional study was conducted by collecting data retrospectively from patient card in Medical ward of Fitch hospital.

### Source population

All patients who are admitted/referred/discharged/died in Medical Ward of Fitch hospital.

### Study population

All patients who are admitted in medical ward and who have taken at least one antibiotic with or without concurrent medication and admitted, referred, discharged, or died in the study period.

### Sampling size and sampling technique

The sample size for this study was calculated using single

population proportion formula based on the following Assumptions:  $p=50%$ , with 95% confidence level and 5% level of precision. So, total of 384 was calculated and since, the number of population was less than 10,000, the correction formula was used and the sample size became: 200 patient cards.

From the total cards of patients who admitted to a medical ward from September 10, 2015 to May 10, 2016 and fulfill the inclusion criteria, 200 patient cards were selected by Simple random sampling using balloting.

### Data processing and analysis

After checking for completeness and consistency, data was entered in SPSS (IBM 20) and descriptive statistics was carried. And data were presented using narratives, tables and figure.

### Ethical consideration

A formal letter was written from Ambo University, College of Medicine and Health Sciences, department of Pharmacy to Fitch Hospital in order to get permission to conduct the study. And Fitch Hospital Administrators were notified about the objective of the study and the confidentiality of patient cards.

## Results

### Socio demographic characteristics

The most age group treated by antibiotics were 15-25 year of age which accounts 61 (30.5%). While the least age group treated by antibiotics were those of greater than 70 year of age. Of the patients, 110 (55%) were males and 90 (45%) were females (Table 1).

### Patterns of antibiotic prescribing

In this study, the total of 340 drugs including antibiotics were prescribed to the total of 200 patients; out of which 220 (64.7%) were antibiotics. From the total of antibiotics, Ceftriaxone 55 (27.5%) was the most frequently prescribed antibiotics followed by doxycycline 40 (20%); Ciprofloxacin 23 (11.5%) and Cephalexin was prescribed for only 2 (1%) patient (Tables 2 and 3).

In this study, from the total of 200 patients, many of the patients are treated by two antibiotics: 84(42%), 70(35%) receive one antibiotics and the rest 46(23%) receive three antibiotics (Figure 1).

With regard to purpose of antibiotic prescribing, this study revealed that majority of antibiotics were prescribed for empirical treatment 163 (81.5%), followed by kinetic treatment 32 (16%) and prophylactic use accounted the least 5(2.5%) (Figure 2).

Variables	Frequency	Percentage
<b>Sex</b>		
Male	110	55%
Female	90	45%
<b>Age</b>		
15-25	61	30.5%
26-36	43	21.5%
37-47	35	17.5%
48-58	25	12.5%
59-69	21	10.5%
70-80	15	7.5%

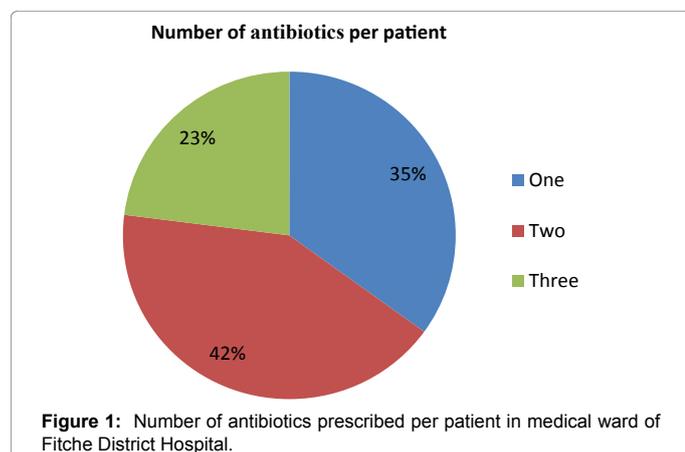
**Table 1:** Socio demographic characteristics of patients in Medical ward of Fitch District Hospital.

Antibiotics Groups	Frequency	Percentage (%)
Cephalosporin	65	32.5%
TTC	40	20%
Flour quinolone	37	18.5%
Metronidazole	21	10.5%
CAF	17	8.5%
Cotrimoxazole	6	3%
Aminoglycoside	7	3.5%
Penicillin	4	2%
Augmentin	3	1.5%
Total	200	100%

**Table 2:** Most commonly prescribed group of antibiotics in medical ward of Fitcha District Hospital.

Antibiotics	Frequency	Percentage (%)
Ceftriaxone	55	27.5%
Doxycycline	40	20%
Ciprofloxacin	23	11.5%
Metronidazole	21	10.5%
Chloramphenicol	17	8.5%
Norfloxacin	14	7%
Cloxacillin	8	4%
Cotrimoxazole	6	3%
Gentamycin	4	2%
Ampicillin	4	2%
Clarithromycin	3	1.5%
Augmentin	3	1.5%
Cephalexin	2	1%
Total	200	100%

**Table 3:** Most commonly prescribed antibiotics in medical ward of Fitcha District Hospital.



**Figure 1:** Number of antibiotics prescribed per patient in medical ward of Fitcha District Hospital.

According to this study Community Acquired Pneumonia (CAP) was the most commonly distributed disease which account 61 (30%) followed by meningitis 38 (19%) and Acute Gastroenteritis (AGE) 25(12%) (Table 4).

In this study, when we see the duration of hospitalization for 200 patients, 80 (40%) stay for 1-4 days, 65 (32.5%) for 5-9 days, 30 (15%) for 10-14 days, 20 (10%) stay for 15-19 days and 5 (2.5%) stay for greater than 20 days in hospital.

### Route of administration and potential drug-drug interaction

In this study out of 220 prescribed antibiotics for 200 patients, most

of them prescribed in IV route which account 76(38.2%), followed by PO 68(34.1%) and IM 16 (6.3%) (Table 5).

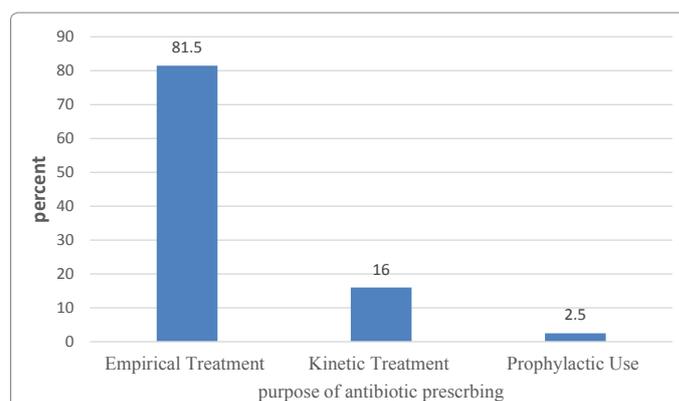
### Appropriateness of antibiotic use

When we see the appropriateness of the antibiotic use with respect to dose, frequency and duration, the study revealed that 181 (90.5%), 194(97%) and 186(93%) were corresponds to appropriate dose, frequency and duration respectively and 14(7%), 5(1.5%) and 10(5%) were inappropriate dose, frequency and duration respectively.

### Discussion

This institution based cross sectional study has investigated antibiotic use in Medical ward of Fitcha District Hospital, North Showa Zone, Oromia Region, Ethiopia.

The use of antibiotics in medical ward is justifiable practice even though it requires a regular review of the chosen regimen to maximize the benefit of the patient. In this study, of the total 340 drugs prescribed in Medical ward, the prevalence of antibiotics use was 220 (64.7%). This finding is lower than the finding of the study conducted



**Figure 2:** Antibiotic treatment types in medical ward of Fitcha District Hospital.

S. No.	Disease	Frequency	Percentage
1	CAP	61	30%
2	Meningitis	38	19%
3	AGE	25	12%
4	UTI	23	11.5%
5	AFI	13	6.5%
6	Typhoid	9	4.5%
7	Septic arthritis	8	4%
8	Cellulitis	7	3.5%
9	PUD	6	3%
10	Rheumatic arthritis	6	6%
11	Other	4	2%
Total		200	100%

**Table 4:** Distribution of common disease for which antibiotics were prescribed in medical ward of Fitcha District Hospital.

Route	Frequency	Percentage
IV	84	38.2%
IV+PO	31	14.1%
PO	75	34.1%
IM	16	7.3%
IM+PO	14	6.3%

**Table 5:** Route of administration of antibiotics in medical ward of Fitcha Hospital.

in Debremarkos Referral Hospital, Northwest Ethiopia where the prevalence of antibiotics use was 71.36% [18]. This might be because the study carried out in Debremarkos was carried in the whole Referral hospital and shows the findings from all departments where as our study only focused in medical ward of Fitcha district hospital.

The finding of this study is higher than the finding of the study conducted in Dessie Referral hospital, Northeast Ethiopia, where the prevalence of antibiotics use was 24.37% [19]. This might be because this study is carried out in outpatient pharmacies and the time gap between the two studies. In this study, of the total 200 patients treated at Medical ward of Fitcha district hospital, majority of them 65% received more than one antibiotic. This finding is almost comparable with the finding of the study conducted in Ayder Referral hospital, Mekelle Ethiopia, where majority of patients 58.8% in the hospital received more than one antibiotic. Although the simultaneous use of two or more antibiotics has a certain rational, indiscriminate or routine use of antibiotic combination may have several negative consequences: primarily, the patient Risk of toxicity from two or more antibiotics, increased cost and the emergence of drug resistance.

In this study, the most commonly prescribed groups of antibiotic were Cephalosporin 32.5% and the most commonly prescribed antibiotic was ceftriaxone 27.5%. This findings is almost similar with the finding of the study conducted in Ayder Referral hospital, Mekelle Ethiopia, where the most commonly prescribed groups of antibiotics and the most commonly prescribed antibiotic were Cephalosporin 32.7% and ceftriaxone 28.7% respectively.

## Conclusion and Recommendations

### Conclusion

This study revealed that of the total of 340 drugs prescribed for 200 patients in Medical Ward of Fitcha District Hospital, 64.7% were antibiotics and the most commonly prescribed groups of antibiotic were Cephalosporin and the most commonly prescribed antibiotic was ceftriaxone. And majority of patients in Medical ward 65% received more than one antibiotic.

### Recommendations

District health office and Fitcha Hospital should work together in order to oversee and control antibiotics use in the hospital, Medical ward in particular. They have to make sure whether standard and national guidelines are being followed during using antibiotics in the hospital.

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