

Anti-microbial utilization in teaching hospitals of Kabul University of Medical Sciences

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Abstract: Antimicrobial resistance is a globally major concern. In developing countries like Afghanistan overuse, misuse, low-quality medicine, self-medication, and irrational use of anti-infection agents are common which may cause antimicrobial resistance. To have information about anti-infectives prescribing patterns in medical clinics is significant in improving the nature of antimicrobial prescriptions. This cross-sectional study was conducted on the use of antimicrobial agents in teaching hospitals of Kabul University of Medical Sciences which is a tertiary care hospital in Kabul, Afghanistan. Data were collected from the medical records department, all in-patients which they admitted during two months from January-February were included. In our study, we found that 519 (85.5%) of 607 patients who were admitted to the hospital received at least one anti-infectives. The average number of anti-infectives per hospitalization was 1.4. Cephalosporins were found to be the majority being 61.3% of the total anti-infectives prescribed, this was followed by Nitroimidazole (15.7%), Fluoroquinolones (9.7%), Penicillins (7.2%), and Aminoglycosides (1.8%). Antimicrobials were ordered empirically in 99% of patients. The percentage of generic prescriptions was 99%. The most antimicrobial prescription was empirically and overuse of ceftriaxone among of anti-infectives medicines is a major concern therefore, educational program regarding antimicrobial resistance is necessary for physicians.

Keywords: Anti-microbial, utilization, Kabul, teaching hospitals.

I. INTRODUCTION

Anti-infective medicines have diminished the burden of common infectious illnesses and their utilization has become crucial for many medical interventions.^{1,2} Their usages are often empiric and based on physician comfort and prior experience, often leading to overuse or misuse of anti-infectives, This expands treatment costs, leads patients to the side effects of these medications as well as increase antimicrobial resistance.^{3,4} Over the previous decade it has been seen that anti-infectives use is on the ascent globally this may cause antimicrobial resistance.^{5,6,7} Antimicrobial resistance is a globally major concern in developing countries like Afghanistan, low-quality medicine, together with self-medication and misuse use are major contributing factors.⁸ Irrational, overuse and abuse of anti-infection agents are common in different counties, a study in New Delhi clearly shows overuse and inappropriate choice of antimicrobial for the treatment of acute, uncomplicated respiratory tract infections which are mainly due to virus and do not require anti-infective treatment.⁹ A study in Iran shows a high rate of empirical and prophylactic antibiotics use, overuse of vancomycin and third-generation cephalosporin.¹⁰ There is limited data on anti-infective prescription, consumption patterns, especially at admission patients in public hospitals in Kabul. The objective of this study is to evaluate the rational use of anti-infectives medicines in public hospitals of Kabul, by the using WHO drug use indicator.

II. METHODS

The study is a cross-sectional descriptive which was done in ten selected wards (Surgery, Orthopaedics, ENT, Ophthalmology, Medicine, Neurosurgery, Obstetrics/Gynaecology, Urology, Dermatology, and Paediatrics) of teaching

hospital of Kabul University of Medical Sciences which is a popular public hospital in Afghanistan with then wards and three ICUs, data were collected from medical records department, The case records of each patient which they admitted during the tow past month were reviewed by members of the study team. The generic name, brand name, route of administration and number of antimicrobial prescribed per admission were documented. And data were analysed by entering into a Microsoft excel and SPSS 21 sheet and applying descriptive statistics.

Inclusion Criteria:

All the patients who were admitted in the teaching hospital of Kabul University of Medical Sciences, of either gender, who included pregnant/lactating mothers.

Exclusion Criteria:

1. The patients who stole away/were discharged against medical advice were excluded from the study.
2. The patients who were referred to higher centres were excluded from the study.
3. All the psychiatric patients were excluded from the study.

III. RESULT

From 607 patients who admitted to the teaching hospitals of Kabul University of Medical Sciences, 519(85.5%) were received one or more anti-infectives medicines. Prescriptions with one anti-infectives were 258 (50%), with two anti-infectives were 155 (30%) and three anti-infectives were 93 (18%). The average number of anti-infective per hospitalization was 1.4 (±SD 0.8). From patients who received anti-infectives medicines, six (1%) had cultures done. The preferred route of anti-infective administration was parenteral (95%). All of advised anti-infectives were from essential medicines list and the 99% of anti-infectives prescribed by generic name.

Among the various classes of anti-infectives, Cephalosporins were found to be the majority being 61.3% of the total anti-infectives prescribed. Shown in Fig. 1. Among of cephalosporins, ceftriaxone being most commonly prescribed (96.2%). The percentage of anti-infective usage in various wards is shown in Tab.1.

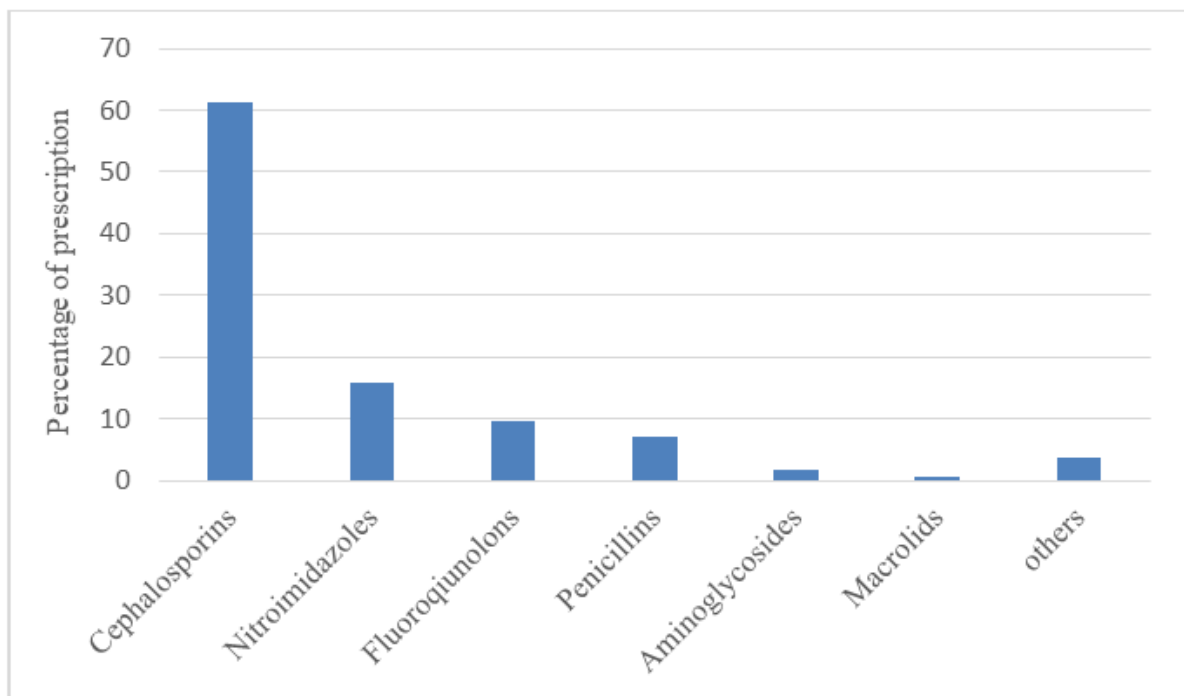


Fig.1. Spectrum of Anti-infective usage among the study population (n=519)

TABLE I. Percentage of anti-infective usage in various wards

	Dermatology	ENT	Obstetrics/ Gynecology	Internal	Neurology	Orthopedic	Surgery	Urology	Pediatric	Ophthalmology
Cephalosporins	55	82	51	54	88	81	56	63	35.3	45
Fluoroquinolones	3	2		20	1	4	9	14	10.3	39
Metronidazole	5	5	39	13	9	11	31	16		
Penicillins	10	10	7	8	1		4	2	23	3
Vancomycin				3					12	
Aminoglycosides		1	3	1	1	4		4	16	
Macrolides	3									
Tetracycline	20									13

IV. DISCUSSION

The impact of the medication companies in developing countries like Afghanistan on the prescribing patterns of doctors has become so high, overuse underuse or misuse of anti-infective medicines may occur which wastes assets, harms people and as well as could cause antimicrobial resistance.¹¹ Therefore, with the help of medicines utilization study, we can facilitate the rational use of anti-infectives medicines. Approximately, 85.5% of patients in teaching hospitals of Kabul University of Medical Sciences were treated with anti-infectives, this value is higher to those studies which reported from developing countries, such as 70% in Iran, 50% in Indonesia, 28.8% in Brazil, 56.8% in Ethiopia, 50.7% in India, 55.2% in Pakistan¹⁶, 64% in Oman¹⁷, and 30.6% in Turkey¹⁵.

In our study, among anti-infectives medicines the third generation of cephalosporin especially Ceftriaxone was found to be mostly used (92.6%). It is higher rates than others studies which were reported 51.7% in India¹⁶, 39.6% in Pakistan²², 23.7% in Turkey¹⁵ and 28.7% in Egypt¹⁸. From 519 patients who received antimicrobial only six patients (1%) were found to have undergone microbial culture investigations this value is lower than studies that were reported 25% in Oman¹⁷, 22% in Turkey¹⁵, 61.6% in South Africa¹⁹, 3.4% in Iran¹⁰. Unfortunately, excessive usage of antimicrobial medicines may lead to antimicrobial resistance therefore physicians must be aware of the prevalence of various pathogens and resistance patterns and exercise good judgment in selecting empirical antibiotic regimens. We would like to recommend that antibiotic selection should be based on culture and sensitivity test results.

In our study the average number of anti-infectives per hospitalization was 1.4 this is in accordance with a study which conducted in Pakistan which was reported 1.422, but It is lower rates than a study which was reported 1.61 in northern India.²⁰ The parenteral route was the most common route of anti-infectives administration that accounted for 94.9%. It is higher than studies that were reported 60% in India¹⁶, 75% in South Africa¹⁹, 46.7% in northern India.²⁰

There are several limitations to this study. First, as antimicrobial use was studied in Kabul University of Medical Sciences public hospital the findings of this study cannot be generalized for the whole of Afghanistan. Second, different wards in the tertiary-care hospital have varying degrees of antimicrobial use. Third, the study is the sample size (cross-sectional analysis of 607 patients) which data is collected from the non-computerized system of the medical record department of a hospital.

We recommend further and larger prospective study to emphasize and ensure the rational use of anti-infectives.

V. CONCLUSION

Of the 519 patients analysed from ten wards, it was observed that in most cases culture sensitivity was not done before prescribing anti-infectives it could cause irrational use of anti-infectives especially antimicrobial resistance in the future. The most frequently prescribed anti-infectives are Ceftriaxone and Metronidazole. And there was an overuse of injections of anti-infectives that may increase the cost of the treatment.

Conflicts of interest

There are no conflicts of interest.

Disclosure

There was no funding.

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