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Hasan ALwan Baiee
Professor Emeritus, Consultant Public, hasanbaiee1951@gmail.com

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ORIGINAL ARTICLE

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Antimicrobial Prescriptions by Practicing Physicians in Southern District, Babylon Governorate and Its Correlates

Hasan ALwan Baiee

Professor, Emeritus. Consultant Public

Abstract

Background: There is a worldwide agreement that to address the problem of antimicrobial including antibiotic resistance proper management of antibiotics across all sectors is required.

Objective of the study: To identify the antimicrobial prescribing practice of Iraqi physicians.

Methodology: This study was a cross-sectional descriptive study, the data collected by trained researchers based on reviewing the available prescriptions sheet dispensed by pharmacists after obtaining their verbal consents and protecting the privacy autonomy of patients. The period of this study started from the first of January through the end of May 2021. Antimicrobials and the number of and types of drugs prescribed for each patient enrolled in the study were studied together with the rout of administrations; (oral intramuscular or intravenous).

Results: The average number of drugs prescribed per patient as checked in the prescription was (4.4). Antimicrobials constituted 54.5% followed by analgesic drugs, about half of the 500 prescriptions revealed two and more antimicrobials. Most of antibiotics were prescribed to males and administered orally. Aminoglycosides are the most commonly used antimicrobials such as gentamycin (23.3%) and Amikacin (12.5%) respectively while cifixime comes the second highly prescribed (15.8%).

In conclusion, the practicing physicians use to prescribe antimicrobials liberally in a way far exceeds the needs of diseased condition.

Recommendations: There Is a strong need for legislation to monitor the prescription of antimicrobials in Iraq. A national chemo therapy guideline for antimicrobials prescribing is requested.

Keywords: Antimicrobial, Practicing physicians, Chemo therapy

1. Introduction

For more than the last five decades antimicrobials were used by human beings as therapeutics, with great benefits and impact to human health. Widespread over use or inappropriate prescriptions have resulted in devastating effects including the emergence of drug-resistant microbes all over the world [1]. According to World Health Organization reports, more than 50% of all antibiotics are prescribed, sold or dispensed incorrectly. In addition, 50% of patients do not take antibiotics properly [2]. Antimicrobial use varies according to different geographical areas, different health systems, cultures and education, socioeconomic status and patients characteristics [3]. Different studies done in developing countries have explained overuse of drugs both in public facilities and in the private health care sectors, this to add to the ever-increasing cost of providing health care [4]. In order to ensure rational prescription of medications, prescribers must adopt a standard scientific guidelines for treatment [5]. One of the most important factors influencing antimicrobial resistance in low- and middle-income countries is the lack of the knowledge attitudes and practices required by health

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E-mail address: hasanbaiee1951@gmail.com (H. ALwan Baiee).

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care staff, mainly doctors for proper antimicrobial use [6].

1. Antimicrobials were used to treat various diseases. However, they cause sever adverse effects, such as allergic reactions, in addition to increased bacterial resistance especially when used indiscriminate way and unrestricted access, this is contributing sever side effects [7, 8].

Developing countries are highly affected by antimicrobial resistance because of high infectious disease burden in these countries, limited access to safe use of guideline of antimicrobial and more optimal drugs, in addition to poor prescribing practices. The appropriate use of antibiotics to slow the pace of resistance development is crucial [9].

Antimicrobials require more prudent prescribing and dispensing than other medicines because these medicines are at a greater risk of antimicrobial resistance [10].

If drug (including antimicrobial) prescription practices are inappropriate and irrational, there is a strong need to examine the patterns of antimicrobial use and there is necessary to change prescription patterns accordingly [11].

Antibiotics overprescribing is the major driving force for the emergence of antibiotics resistance [12].

There were a high rate of antibiotics prescribing in the health centers often which might exacerbate the adverse effects of antimicrobial including resistance situation in many countries including Iraq [12–18].

2. Methodology of Data Collection

This is across sectional descriptive study which was conducted at the southern district of Babylon province Iraq. The sample size was calculated according to the following equation which indicated that prevalence of doctors who prescribe Antimicrobials was 50% = 0.50].

$$\text{Confidence level} = 95\%$$

$$\text{Margin of error (d)} = 5\%$$

$$n = (Z\alpha/2)2 \times P(1-P)\backslash d2$$

Where:
n- The sample size required
P- Prevalence of prescriptions prescribed by private sector physicians in similar local study.
d- Marginal error (0.05)2
$Z\alpha/2$- Standard normal value at $(1-\alpha)$ 100% confidence level

$$\frac{(1.96)2 \times 0.5(1-0.5)}{\text{————————}} = 384 \text{ ——} + 40 \text{ for non-response}$$

Table 1. Frequency distribution of drugs prescribed by doctors.

Groups	Frequency	Percent
Antimicrobial	1200	54.5
Analgesics	600	27.3
Tonics and vitamins	300	13.6
Hypnotic	100	4.6
Total	2200	100%

Table 2. Frequency distribution of medical prescriptions according to types of antimicrobials administered.

Antibiotics	Frequency	Percent
Azthromacin	100	8.4
Amikacin	150	12.5
Ceftizoxime	70	5.8
Ceftriaxone	90	7.5
Cefixime	190	15.8
Meropenem	40	3.3
Gentamicin	280	23.3
Levofloxacin	70	5.8
Tetracycline	50	4.2
Amoxicllin	66	5.5
Ampicillin	44	3.7
Others	50	4.2
Total	1200	100.0%

(0.05)2 = 424, it was decided to select 500 prescription sheets. Data were collected by examination the prescription of doctors from all types of specialties in Al qasim district, south Babylon governorate – Iraq from January through May 2021, this work was done in cooperation with pharmacists working in the private sectors, the number of drugs were counted in each sheet. Antimicrobials dispensed were categorized according to the number prescribed to each patient, its type, rout of administration, Data were presented in tables and graphs. Chi square test was applied for categorical variables to test the significance of difference, $p < 0.05$ considered significant and p value of 0.0001 and more is highly significant.

3. Results

Table 1 and Fig. 1 reveal that most of the prescribed drugs by the doctors are antimicrobials (54%) followed by analgesics while analgesics are the lowest.

Table 2 shows that the most common antimicrobial used by medical doctors was gentamycin (23.3%) followed by Cefixime (15.3%), the lowest is tetracycline (3.7%).

Table 3 explains the frequency distribution of the number of antimicrobials in one medical prescription.

Table 4 and Fig. 2 depict the frequency distribution of antibiotics according to the route of administration, the most common rout of administration is the oral rout (50%) followed by the topical (30%) then the parenteral rout (Intramuscular and or

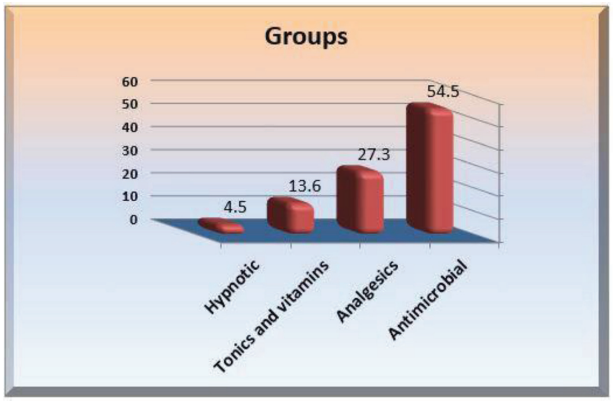

Fig. 1. Frequency distribution of prescriptions according to types of drugs deepened by doctors.

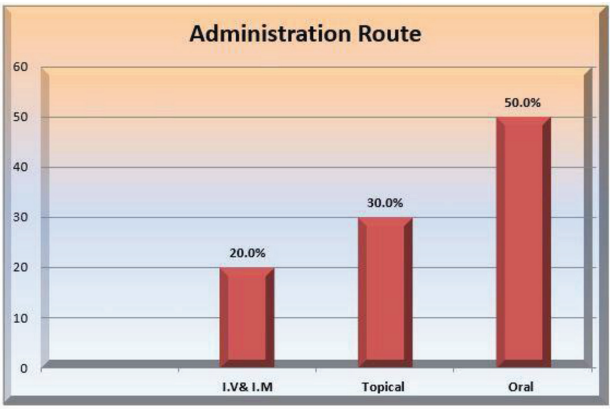

Fig. 2. Shows Distribution of antibiotics according to the route of administration.

Table 3. Frequency distribution of number of antimicrobials in one medical prescriptions.

	Frequency	Percent
One antimicrobial in one prescription	250	50.0
Two antimicrobials in one prescription	150	30.0
Three antimicrobials in one prescription	100	20.0
Total	500	100.0%

Table 4. Frequency distribution of antibiotics according to the route of administration.

	Frequency	Percent
Oral	250	50.0
Topical	150	30.0
Intravenous and intramuscular (IV + IM)	100	20.0
Total	500	100.0%

intravenous). Table 5 shows that the frequency distribution and difference in number of antibiotics prescribed in medical prescription according to gender, males are more exposed to one and two antimicrobials in a very highly statistically significant difference than females $p < 0.0001$, while females exposed significantly to three antimicrobials $p < 0.0001$.

4. Discussion

The availability of an accurate updated source of data about the proper use of antimicrobial drugs is essential issue to combat their missuses by health care providers [19]. The findings of this study shows that there is over use of antimicrobials and antibiotics, this finding is supported by the findings reported by other studies [12–15] and goes in line with the finding reported by a local study conducted in Babylon Governorate [20].

In developing countries, one of the most important factors affecting antimicrobial misuse is the bacterial resistance, this may be contributed to the shortage of proper training/medical education of healthcare providers regarding proper antimicrobial use [2]. In Europe the situation is the same regarding training the undergraduate medical students, most senior medical students lacked proper and adequate training in antibiotic prescribing and desired further education [21]. There is a wide variations in the exposure of students in different European countries to scientific and standard principles of appropriate antimicrobials prescribing was observed [22].

Aminoglycosides are the most common antimicrobials prescribed by physicians, this finding disagrees with the finding of previous local study conducted in Hilla city of Babylon Governorate which reported that ampicillin was the most commonly prescribed antibiotics [20]. This may be related to the sample sizes, the availability of drugs or the bacterial resistance due to in appropriate use of these drugs, over use of aminoglycosides leads to serious consequences. The

Table 5. Frequency distribution and difference in number of antibiotics in medical prescription according to gender.

	Male		Female			
	No.	%	No.	%	Total	P. value
One antimicrobial in the prescription	150	60.0	100	40.0	250	0.0001* HS
Two antimicrobials in the prescription	79	52.7	71	47.3	150	0.0001* HS
Three antimicrobials in the prescription	48	48.0	52	52.0	100	0.0001* HS
Total	277	55.4	223	44.6	500	0.000* HS

HS = highly significant

lack of antimicrobial stewardship exposes the society to unwarranted medication and contributes to the development of antimicrobial resistance [23]. This study shows that two or more antibiotics in one prescription (50%) is very high, these drugs usually prescribed to patients with serious and chronic diseases treated in hospitals not in private clinics where simple and mostly viral infection were reated.

Globally, 700,000 people die annually due to antimicrobial resistance; this number is expected to increase up to 10 million deaths by 2050 unless effective preventive actions are taken [24]. In the Eastern Mediterranean Region, the extent of antimicrobial resistance health problems and financial cost remains unclear as real data are not yet available, according to the World Health Organization [25]. There is a considerable inadequate training for doctors in Saudi Arabia, with a need for proper physician education regarding rationale of prescribing o antimicrobials [26].

According to the Centers for Disease Control and Prevention (CDC) in the, one out of every three antibiotic prescriptions is unnecessary [27]. A study conducted in China by Wang et al. showed that patient records found that inappropriate and incompetent education of the healthcare providers significantly contributed to antibiotic over prescription [28].

Finally are doctors who misuse antibiotics too rushed, too worried, must be too eager from the work on future good research papers [29]. To achieve the goal of rational antimicrobials usage [30].

Conclusion

The current study revealed that practicing physicians over use antimicrobials.

Recommendations

Raising the level of doctor regarding the appropriate use of these double aged swards drugs and the best ways to minimize inappropriate use include developing a careful guidelines and criteria for the proper diagnosis of common diseases and teaching patients about appropriate indications for antibiotics.

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