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ORIGINAL STUDY

Physicians' Perspective Regarding the Prevention of Antibiotics Resistance

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ABSTRACT

Background: Antibiotics' resistance is one of the global health problems. The misapplication and misuse of antibiotics ultimately result in antibiotic resistance. Antibiotic prescription is a complex processes that affected by many factors; these factors are mutually reliant and related to physicians' knowledge, healthcare providers' participation, healthcare system itself, patients and the general public.

Aim of the study: To identify physicians' perspective concerning antibiotics resistance.

Methodology: A cross sectional study was used to find physicians' view about antibiotics resistance. The sample consist of 300 physicians who working in different governmental health institutions in Mosul City. Data was collected from study population by direct interview using a prefilled questionnaire after obtaining verbal consent. Data collection was extended over a period of three months. Data analysis attempted by using software program SPSS.

Results: More than half of participants (59.3%) was in the age group was between (25- < 35) years. Male were forming 55.7% of study population. More than half (54%) were permanent, and 35% of study population had experience between (5- < 10) years. Antibiotic intakes by patients, and antibiotic prescriptions by doctors was rated as the most sectors that to be targeted to slow down the development of antibiotic resistance by 68% and 52% of physicians subsequently. The availability of antibiotics and own experience the most rated factors affecting antibiotic prescription by 57.3% and 51% of participants subsequently. About two third (62.3%) of participating physicians anticipate that the use of antibiotic often results in development of antibiotic resistance.

Conclusion: According to physicians' point of view; the doctors, patients and health institutional facilities have a role in the prevention of antibiotic resistance. It is recommended to implement a national strategy for rational antibiotics' prescription.

Keywords: Antibiotics' resistance, Physicians' perspective, Antibiotic prescription, Antibiotic contributions

1. Introduction

According to word health organization (WHO) antibiotic resistance is one of the 10th hazards to global health (Rusic et al., 2021, Chetty et al., 2024). There is a high economic burden on health systems will result from antibiotics resistance resulting in increased morbidity and mortality (Shawi, 2020). Antibiotics consumption was increased by 39% internationally during the period between (2000 to 2015) which in-

evitably reflected on bacterial resistance mechanisms that cannot be ignored (Veerapa-Mangroo et al., 2024).

Antibiotic prescribing decisions by doctors are influenced by various factors, including patient expectations and physicians' concerns about potential complications and the risk of losing patients (Vu et al., 2024). Proper antibiotic use and preventive measures can lead to significant healthcare savings by eliminating drug-resistant microbes caused by

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improper antibiotic use. Hygiene practices and barrier precautions are essential, as multidrug-resistant microbes, often a result of overprescribing, are frequently transmitted between patients. Healthcare workers also represent a key source of bacterial contamination resistant to drugs (Caron and Mousa, 2010). World Awareness Week (WAAW) is an annual global campaign aimed at enhancing awareness and understanding of antimicrobial resistance (AMR). It encourages best practices among the public, health stakeholders, and policymakers, all of whom play a crucial role in preventing the further emergence and spread of AMR (WHO, 2024).

In Iraq antibiotics have been recommended inappropriately and indiscriminately and antibiotics' resistance is common problem (Al-Naseri, Turki, and Hamoud, 2019, Al-Jumaili and Ahmed, 2024, Fayad et al., 2023). Highly resistant bacteria were isolated from sewage water in Mosul city which indicate a real problem that need to be resolved (Al-Qatan, Al-Khayyat, and Saeed, 2019). Consequently this study aimed to identify physicians' perspective about antibiotics' resistance.

2. Subjects and methods

2.1. Administrative agreement

The administrative agreement was obtained from Family and Community Medicine Department of Mosul Medical College before the conduction of the present study. Prior to data collection, essential official permissions were obtained from the Nineveh Health Department after fulfill its requirements to facilitate data collections that are needed in this work.

2.2. Ethical considerations

A verbal consent was obtained from each participant in the study after informing them that participation is optional.

2.3. Study setting

The study was conducted in 8 primary health care centers 4 in each bank of the city in addition to two main hospitals in Mosul one in each bank of the city. The eight primary health care centers that included in the study were the following: Al-Znjilli primary health care center, Bab Al-baydh primary health care center, Al-Rabie primary health care center and Al-Gharbi primary health care center in the right side. Whereas: Al-Sharqi primary health care center, Al-Sukkar primary health care center, Al-Arabi primary health care center and Al-Qudus primary health care

center in the left side. The hospitals that included in our study are: Ibn Sina Teaching Hospital in the left bank and Al-Jumhoori Teaching Hospital in the right bank.

2.4. Study design

A cross sectional study was chosen to achieve the study objectives.

2.5. Study duration

The collection of data lasts for three months starting from 1st of May 2024 till the end of July 2024.

2.6. Study population

All Physicians, who work in the previously mentioned health institutions that included in the study settings, were invited to participate in the study after taking verbal consent.

2.7. Sample size

The sample was estimated according to response rate for physicians working in the chosen study settings. The response rate was 61.7% which equal to 300 physicians represent the total number of respondents.

2.8. Data collection tool

The required information and data was collected from participants by using a prefilled modified questionnaire form depending on review of other studies.

The form consists of different sections; the first one designed to collect general information of respondents which are: Age in years, gender, specialty and years of experience. The second part planned to collect information about the knowledge of study population regarding sectors that to be targeted to slow down the development of antibiotic resistance. There was other part of the questionnaire form used to display the factors affecting antibiotic prescription from physicians' point of view. The last section was concerned with gathering information about physicians' assessments of the consequence of antibiotics use.

2.9. Data collection

The data collected by distributing a prefilled questionnaire form to the respondents by direct face to face interview. The study population was informed about the purpose of the research and that all infor-

Table 1. Characteristics of study population (n=300).

Variable	No. (n=300)	(%)
Age in years		
25 - <35	178	59.3
35 - <45	68	22.7
45 - <55	40	13.3
55 - 65	14	4.7
Gender		
Male	167	55.7
Female	133	44.3
Specialty & degree		
Rotator	40	13.3
Permanent	162	54.0
G.P.	22	7.3
Specialist	72	24.0
Consultant	4	1.3
Years of experience		
< 5	84	28.0
5 - <10	105	35.0
10 - <15	37	12.3
15 - <20	22	7.3
20 - <25	21	7.0
25 - <30	18	6.0
30 - <35	13	4.3

mation will be kept confidential and no name will be taken.

2.10. Statistical analysis

The collected data was transformed into Exile sheet and later exported to software program SPSS for statistical analysis. Any incomplete sheet or missing data was ignored.

The results presented in to suitable tables in the form of frequency and percent arranged previously for this purpose. Any significant differences were tested by using Z-test and Chi-square goodness of fit test. The level of statistical significances depends on a cutoff point of p-value of 0.05 or less.

3. Results and discussion

Table 1 reveal that more than half of participants (59.3%) in the age group was between (25-<35) years. Male were forming 55.7% of study population. More than half (54%) were permanents, and 35% of study population had experience (5- <10) year.

Table 2 show that physicians select antibiotic intake by patients and antibiotic prescriptions by doctors was the main sectors to be targeted to control antibiotic resistance by 68.0% and 52% in sequence.

In Table 3 it was found that availability of antibiotics and own experience considered factors affecting antibiotic prescription by 57.3% and 51% of participants subsequently.

Table 2. Study population knowledge regarding sectors that to be targeted to slow down the development of antibiotic resistance.

Sectors**	No.	%	P-value*
Hospital hygiene	114	38.0	<0.001
Animal farm hygiene	18	6.0	<0.001
Private food hygiene	34	11.3	<0.001
Antibiotic use in hospitals	145	48.3	0.564
Antibiotic intake by patients	204	68.0	<0.001
Antibiotic prescriptions by doctors	156	52.0	0.488
Antibiotic use in livestock	54	18.0	<0.001

* Z-test of one proportion ** More than one choice can be chosen.

Table 3. Factors affecting antibiotic prescription.

Factors**	No.	%	P-value*
Own experience	153	51.0	0.729
Recommendations from pharmaceutical companies	78	26.0	<0.001
Recommendations from senior	122	40.7	0.001
Local resistance patterns	108	36.0	<0.001
Availability of antibiotics	172	57.3	0.011
Cost of antibiotics	136	45.3	0.106

* Z-test of one proportion ** More than one choice can be chosen.

In Table 4 there was 69.3% of physicians expected that antibiotic usage contribute to diarrhoea sometimes and 62.3% anticipated that excessive use of antibiotics will result in emergences of resistant strain of bacteria. On other hand 79.6% suppose that antibiotic prescription will rarely reduced the rate of influenza.

Antibiotic resistance is a serious health problem so the rational antibiotic prescription is important. This can be achieved by choosing proper category of antibiotic with correct dosage and ideal course and avoiding unnecessary prescription to avoid the probable side effect or resistance, and also educating the patient that the antibiotic is not magic solution for every health problem (Veerapa-Mangroo et al., 2024, Acampora et al., 2024).

Regarding study population knowledge about sectors that responsible for the development of antibiotic resistance; it was found that antibiotic intake by patients and antibiotic prescriptions by doctors was rated as the most sectors that to be targeted to slow down the development of antibiotic resistance by 68% and 52% of physicians subsequently, While, in Salam Md A et. al reported the good microbiology practice, surveillance, monitoring, minimizing OTC antibiotics and antibiotics in food animals playing the most important role in the control of the spread of antibiotic resistance (Nicholson et al., 2018). This may related to the availability of antibiotics as one of the over contour medication and antibiotics resistance was not taken as a serious problem by our physicians.

Table 4. Study population assessments regarding the contribution of antibiotics prescription.

Contribution	Rarely		Sometimes		Often		P-value*
	No.	(%)	No.	(%)	No.	(%)	
1-Diarrhoea in the person taking antibiotics	67	22.3	208	69.3	25	8.3	<0.001
2-Future resistance to antibiotics	10	3.3	103	34.3	187	62.3	<0.001
3-Reduced rates of influenza	239	79.6	50	16.7	11	3.7	<0.001
4-High quality care	170	56.7	112	37.3	18	6.0	<0.001
5-Interaction with other medications	51	17.0	194	64.7	55	18.3	<0.001
6-Rash	77	25.7	194	64.7	29	9.6	<0.001
7-Family perception of high quality care	124	41.3	130	43.3	46	15.3	<0.001

* Chi-square goodness of fit test.

In the present study the availability of antibiotics and own experience was the most rated factors that affecting antibiotic prescription by 57.3% and 51% of the physicians respectively. According to Jaafer M et al study; there is no applied institutional guideline for antibiotics prescription and there is high prescription of prophylactic antibiotics in Iraqi hospitals and particularly high empiric use of antibiotics (Jaafer et al., 2021). In contrast, in Nicholson A et, al study in 2018 the severity of the infection and site of the infection was rated by 91% and 90% subsequently followed by availability of antibiotics by 84% of participants (Padmanabha and Rajashekar, 2018). While in a recent Ethiopian study depicted that factors related to physicians assessment of the threat of antibiotics' resistance, patients pressure on prescribers and limited diagnostic and health facilities affecting antibiotics prescription (Altaye, Thupayagale-Tshweneagae, and Mfidi, 2024). Whereas, in other study the decision to prescribe antibiotics depend on the elevated C - reactive protein which is used to encourage rational antibiotic use (Salam et al., 2023). Ideally, there is a need of agreed practical guidelines in our health institutions together with coordination of antibiotic supplies to these institutions..

In relation to the prevalence of side effect due to antibiotic prescription; the current study showed that 69.3% of participating physicians anticipate that the use of antibiotic results (sometimes) in development of diarrhea. In comparison to a study done in 2022 focusing on Polish medical doctors the results demonstrate that 100% of the doctors assumed that using antibiotic can lead to diarrhea and colitis as a side effect (Zgliczyński, Bartosiński, and Rostkowska, 2022). The result of our study showed that 62.3% of the participants supposed that using antibiotic (often) lead to future resistance of antibiotic, and this result was similar to a result from a research done in 2024 about antimicrobial resistance where using antibiotic can lead to emergence of future antibiotic resistance (Ahmed et al., 2024). In Al-Homaidan and Barrimah study physicians deliberated that gastroin-

testinal tract distresses, allergic reaction, and drug resistance was the most side effect of antibiotics (Al-Homaidan and Barrimah, 2018).

Our study also demonstrates that the majority of the participants said that using antibiotic rarely lead to reduce rate of influenza. Similarly, Carrat F et, al study revealed a nearly same result (Carrat et al., 2004). In comparison, Smith ER et al. in their study declared that influenza vaccination and proper diagnosis for the infection are important factors in treating influenza without antibiotics use (Smith et al., 2020). Probably public pressure on antibiotics use with any infection especially in our locality imposes antibiotic prescription even without indication.

In conclusion Antibiotic intakes by patients and antibiotics prescription by physicians are the sectors that should be targeted to slow down the development of antibiotic resistance. The frequent selected factors that affecting antibiotic prescription are the availability of antibiotics and own experience. It is recommended to implement a national strategy for rational antibiotics' prescription by emphasizing on conducting educational programs about antibiotics indications and resistance together with the availability of agreed guideline for antibiotics prescription.

Conflict of interest

There is no conflict of interest was existed.

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