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Antibiotic Prescribing Practices in Libya: A cross-sectional Survey

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ABSTRACT

Antibiotic resistance is one of the most important risks that endanger global health, food security, and development today. It happens due to the emergence of resistant bacteria strains that are able to survive exposure to different antibiotics and continue to multiply in the body, potentially causing more harm and spreading to other animals or people. Usually this is the result of misuses and overuses of antibiotics which are associated with many adverse outcomes.

The aim of this study was to investigate the practices of doctors regarding their antibiotic prescription.

An online cross-sectional survey of Libyan doctors was conducted over a period of seven weeks. This 11-item self-administered questionnaire was built using the "Google forms" application and was distributed using social network groups of doctors.

A total of 185 doctors have completed the questionnaire, with 72.4% female and 27.6% male. Almost half (47%) of the responding doctors were dentists. About a half (49.2%) had a working experience of 5 years or less. The majority (66.7%) of the respondents stated that they do follow standard infection control and prevention precautions. 37.4% of the respondents answered that they do prescribe antibiotics based on culture and sensitivity tests and exactly same rate reported they do not. About 75% of the doctors stated that they follow antibiotic prescribing guidelines. Only 18% declared that they may prescribe antibiotics even if they know they are not really needed. Most of those prescribers justified this practice due to the demand of patients.

According to the results of this study doctors seemed to follow general guidelines for antibiotic prescription and infection control, but cultures were not routinely done.

Keywords- *Antibiotic; Prescribing; Practices; Resistance.*

INTRODUCTION

Since the beginning of antibiotics discovery the problem of antibiotic resistance has been a serious threat for humans.[1] The effects of antibiotic resistance are associated with increased mortality and morbidity, in addition to increased hospital stay and costs.[2] This problem happens due to many factors, but the main contributing factors are, antibiotic overuse, and inappropriate antibiotic prescribing.[3] The Center for Disease Control and Prevention's (CDC) definition of inappropriate antibiotic prescription includes unnecessary prescribing of antibiotics as well as wrong antibiotic selection, incorrect dose and improper duration.[4] Doctors as prescribers and patients as consumers, all contribute to the problem of antibiotic overuse and as a result, the widespread increase of antibiotic resistance.[5] Physicians sometimes prescribe antibiotics for non-pharmacological reasons.[6] For example, general practitioners overestimate symptoms of respiratory tract infections when indicating antibiotic therapy in daily practice.[7] The issue of antibiotic resistance is a global threat that requires parallel and coordinated national and international efforts to prevent its spread. Internationally, the World Health Organization (WHO) has launched a global action plan on antimicrobial resistance, including antibiotic resistance in 2015.

This global action plan aims to ensure prevention and treatment of infectious diseases with safe and effective medicines.[8] Nationally, where antibiotic resistance seems to be indisputable[9,10] and is rapidly increasing[11], too much effort is required to apply preventive measures to tackle this problem. In this regard, and as a part of a local awareness campaign combating antibiotic resistance that is to be held during 2018 World Antibiotic Awareness Week in Benghazi, Libya, this study was constructed to investigate the practices of doctors regarding antibiotic prescribing. The results of this study could be used developing strategies toward improving antibiotic prescribing practice.

MATERIALS AND METHODS

An online cross-sectional survey of Libyan doctors was conducted over a period of seven weeks during the months of June and July 2018. An eleven items self-administered questionnaire was built using the "Google forms" (Google©, 2018) application and was distributed using Facebook

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healthcare professional groups. The questionnaire consisted of a series of closed multiple choice questions. Most of these questions were adapted and modified from previous WHO antibiotic awareness campaign materials. The questionnaire included 4 questions related to the demographic information of the practicing doctors and 7 questions about their antibiotic prescribing behavior. The demographic questions included gender, specialty, position, and working experience of the participants. The rest of the questions were about, following standard infection control and prevention precautions, prescribing antibiotics based on culture and sensitivity test results, prescribing antibiotics only when needed and according to current guidelines, educating patients about proper use of antibiotics, antibiotic resistance and danger of antibiotics misuse, and whether they ask patients about their previous and present antibiotic use. The survey responses were processed and the data from all the respondents were analyzed and interpreted by "Google forms". This is an application by Google© that allows building surveys and interpret the corresponding data. Descriptive statistics including percentages and frequency distribution were computed for each of the variables.

RESULTS

One hundred and eighty-five (185) doctors (134 females and 51 males) were participated. Of the total participants, nearly half (47%) were dentists and 50.8% of them were with 5 years of experience or more (Table 1).

Table 1: Respondents Demographic Characteristics

Category	No.	%
Gender:		
Male	51	27.6%
Female	134	72.4%
Specialty:		
Internal Medicine	25	13.5%
Dentistry	87	47%
Obstetrics and Gynecology	12	6.5%
Surgery	16	8.6%
Pediatrics	18	9.7%
Dermatology	5	2.7%
Ophthalmology	3	1.6%
Other	19	10%
Position:		
Consultant	16	8.7%
Specialist	39	21.2%
Registrar	13	7.1%
Senior House Officer	28	15.2%
General Practitioner	74	40.2%
Intern	14	7.6%
Working experience:		
0-5 years	91	49.2%
6-10 years	30	16.2%
11-15 years	35	18.9%
Over 15 years	29	15.7%

Two-third of the respondents said that they always adhere to basic infection control and prevention measures at their workplace and three-quarter of the doctors reported that they follow guidelines in their antibiotic prescribing practices (Table 2).

Table 2: Adherence of participants to standard infection control and international guidelines for antibiotic prescription**.**

Response	No.	%
Adherence to standard infection control		
Yes	122	66.7
No	6	3.3
Sometimes	55	30.1
Adherence to international guidelines for antibiotic prescription		
Yes	136	75.4
No	4	2.3
Sometimes	40	22.3

The percentages of doctors who stated that they prescribe antibiotics without culture sensitivity tests and those who do after performing antimicrobial susceptibility testing were interestingly equal (37%) (Figure 1).

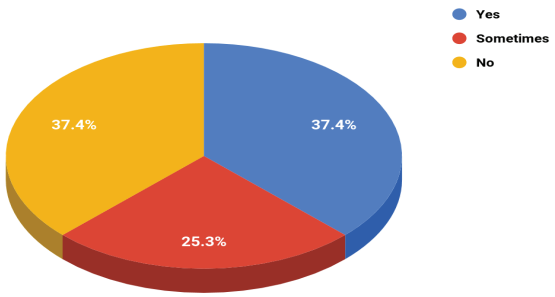

Figure 1: Response of participants about prescribing antibiotics based on culture and sensitivity test results.

About half (51%) of the participants who reported they don't "routinely" prescribe antibiotics based on culture sensitivity test results had less than 6 years' experience, whereas half (50%) the doctors with over 15 years of experience indicated they use culture and sensitivity testing to determine the most effective antibiotic against specific bacteria (Figure 2).

Figure 2: Response of doctors regarding prescription of antibiotics based on culture results, by years of experience.

Only 18% declared that they may prescribe antibiotics though they know it is not needed (Figure 3).

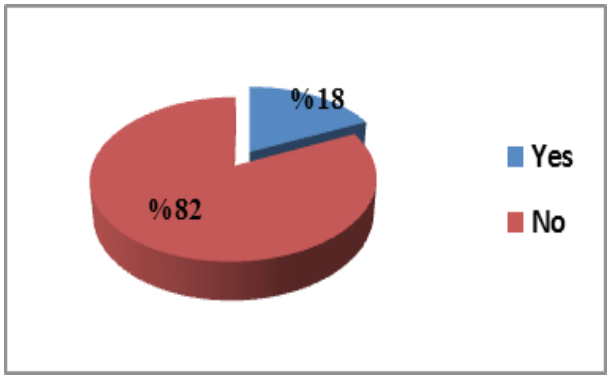

Figure 3: Response of the doctors regarding prescription of antibiotics even if they know it is not needed.

Most of those prescribers justified this practice due to the demand of patients or fear of spread of infection. Further analysis and interpretation revealed that almost two-third (61%) of doctors who acknowledged that they over-prescribed antibiotics had 0-5 years of working experience (Figure 4).

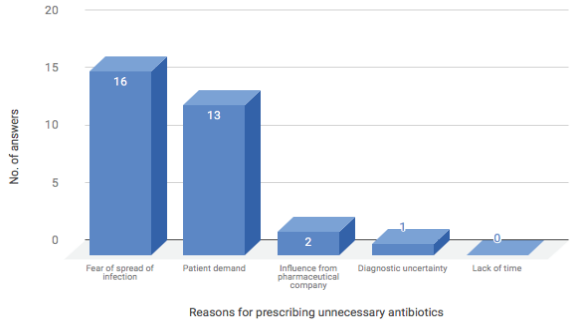

Figure 4: Response of the doctors regarding prescription of antibiotics for unapproved reasons.

DISCUSSION

The topic of antibiotic resistance is a global threat to human health. This threat is more complicated in developing countries such as Libya, because of other factors related to health care professionals practices and patients' behavior towards the use of antimicrobials (Ayukekbong et al. 2017).[12] Due to the important role of the prescribers i.e. physicians and dentists in this problem, we aimed in this study to focus on doctors contribution to the issue of improper prescription of antibiotic and subsequently the possibility of antibiotic resistance.

As seen a large number of the responding doctors mentioned that they follow the standard infection control and prevention precautions, and prescribe antibiotics according to current guidelines, though this may not be always the case in all healthcare settings. The results of Bharathiraja et al study (2005)[13] on factors affecting antibiotic prescribing pattern in Chennai India; indicated that inpatient physicians were more likely to comply with antibiotic therapeutic guidelines and protocols compared with outpatient physicians. In 2011, a WHO publication on rational use of medicines found that fewer than half of all countries of the world have applicable clinical guidelines and policies on proper use of medicines.[14] In spite of the availability of clinical practice guidelines developed by the Infectious Disease Society of America, physicians poorly adhere to these guidelines especially in the Emergency Department observation unit.[15] Before prescribing antibiotics, it is recommended to obtain a clinical specimen and use antibiotic sensitivity tests to identify the specific causative agent and determine whether antimicrobial treatment is indicated.[16] However, this step is not regularly performed worldwide. For example, general dental practitioners in the Czech Republic don't typically request a pathological culture before antibiotic administration.[17] Despite there is no evidence supporting the use of antibiotics in the management of viral infections, but physicians in the US still continue to prescribe antibiotics for diseases of viral origin such as upper respiratory tract infections, bronchitis, influenza and otitis media with effusion.[18] As seen about 37% of total participants in this study said that they prescribe antibiotics based on culture and sensitivity test results, which may be considered an acceptable rate in the current situation with the lack of qualified laboratories in our facilities. Doctors' knowledge and experience are other factors that may influence antibiotic prescribing behavior and contribute to inappropriate use of antibiotics.[13,18-20] Bharathiraja et al. (2005)[13] researched the effect of postgraduate study and continuing medical education for pediatricians working in private practices in India on their antibiotic prescribing decisions for common viral childhood illnesses; results showed that pediatricians who furthered their studies and updated their skills and knowledge, were less likely to prescribe antibiotics for children presented with classical symptoms of acute viral infection for less than a week, compared with physicians who had not pursued postgraduate training. In support of Bharathiraja et al (2005) findings, Andrajati et al (2017)[19] confirmed that physicians who received additional training on proper use of medicines had better knowledge on antibiotic use and were more reasonable in prescribing antibiotics than those who had not undergone similar training. Similarly, in dental healthcare, lack of knowledge on the effectiveness of antibiotics and insufficient understanding of pathological processes of common oral conditions were attributed to the inappropriate use of antibiotics by dental healthcare practitioners as observed by Peric et al in their comprehensive study conducted in Croatia in 2015.[21] Present study findings showed that the length of experience is a main predictor of rational antibiotic prescription and plays an important role in shaping doctors' antibiotic prescribing behavior. A systematic review on multi-aspect strategies targeting patients, public and physicians to reduce inappropriate antibiotic use had shown that education of patients about ineffectiveness of antibiotics in management of self-limiting infections was critical and successful in improving overall antibiotic prescribing.[22] In 2010, Kotwani et al reported that primary care physicians declared that due to overcrowding, time with each patient was not sufficient to educate them about their condition and discuss whether antibiotic is needed or not; and admitted prescribing unnecessary antibiotics to save time.[20] Imanpour study indicated that spending more time with a doctor may reduce unnecessary prescribing of antibiotics for viral disease.[18] But according to the findings of current study, doctors did not seem to consider " Lack of time" as a cause for their unneeded antibiotic prescribing.

Prophylactic use of antibiotics is controversial, and restricting their use in healthy individuals with no underlying diseases is recommended.[16] Antibiotic prophylaxis for dental patients

at risk of infection has been recently debatable and not beneficial.[23, 24] Consistently, US studies show that decreased use of antibiotics both for therapeutic and prophylactic reasons was correlated with decreasing rates of colonization with resistant organisms.[25] In the present study, prophylactic use of antibiotic to prevent the spread of infection was the most common reason behind unessential use of antibiotics.

Generally, this study had numerous limitations attributed to its design which may cause the problem of recall bias. Another important drawback of this study is the small number of respondents, which is due to the low response rate. This may render the results not representative, and make them inconclusive. An additional problem was the variation in the total number of responses for each question; this is due to the missing answers to some questions.

CONCLUSION

In present study doctors follow standard therapeutic guidelines in antibiotic prescribing. Nevertheless, it has been found that antibiotic prescribing decision is complex and influenced by several factors, such as patient demand, prophylaxis, diagnosis uncertainty, and doctors' experience.

RECOMMENDATIONS

Further studies exploring these factors will be helpful to establish and implement interventions to improve antibiotic prescribing and use in Libya. It is also recommended that the national health authorities should take action and enact laws and regulations to control antibiotic overuse.

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