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Research Article

Perception of Doctors at Elobied Teaching Hospital Toward Antibiotics Resistance As a Health Threat

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Abstract

Background: Resistance to antibiotics has increased dramatically over the past few years and has now reached a level that places future patients in real danger. Several factors contribute to this problem, some of them are health workers related and others are community related. This study aimed to assess the awareness of doctors in Elobeid hospital, North Kordofan state, Sudan about the problem, its causes, and its possible preventive measures.

Methods: This descriptive, questionnaire-based study was conducted in Elobeid teaching hospital between 2020, February 27 and March 13. The study involved 50 doctors in the internal medicine department.

Results: Out of the 50 doctors involved, 49 (98%) agreed that antibiotics resistance is a big progressive health threat in Sudan; 86% of the participants think that self-medication is the leading cause of antibiotic resistance; and 98% believe that providing good quality culture and sensitivity service in hospitals and health centers is the most effective preventive measure. Regarding education about antibiotics as a part of academic activities in the unit during the last year, 36% of the participants received zero sessions, 68% received 1–5 sessions, and 12% received more than 5 sessions. The assessment of doctor's adherence to the *Sudan Standard Treatment Guideline* revealed that 28/50 participants (56%) did not see it or hear about it, 17/50 participants (34%) know it but don't comply, and only 5/50 participants (10%) know it and comply with it.

Conclusion: Participants show a good awareness about the significance of antibiotics resistance as a health threat, a good awareness about the main causes and the possible preventive measures, a low to moderate frequency of education on antibiotics, and a very poor adherence to the *Sudan Standard Treatment Guidelines*.

Keywords: antibiotics, resistance, doctors, awareness

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1. Introduction

The era of antibiotic treatments began with the discovery of Penicillin by Alexander Fleming in 1929, subsequent extraction of it from the filtrate of the fungus *Penicillium notatum* by Fleming *et al.***i**n 1945, and the synthesis of the first sulfonamide, prontosil, in 1935 by Gerhard Domagk**w**hich was the first commercially available antibacterial [1, 2].

Since that time, a great quantity of research has yielded many useful drugs [1, 3]. From 1980s until now, the rate of antibiotics discovery has fallen dramatically, and the field suffered from decades of under-investment by companies and governments. This falling can be explained by three reasons:**T**he progression of the antibiotic resistance phenomenon, the decline in investment in antibiotics due to the perception that infectious disease is somehow a "yesterday's problem," which shifted research priorities in favor of noncommunicable diseases, and the tendency of pharmaceutical companies to invest in the areas of higher commercial return which opened the way for a shift in resources to chronic conditions such as cancer, diabetes, and cardiovascular diseases [4–6].

The situation in Sudan regarding our research topic was assessed in previous studies, one of them in River Nile State 2014 which revealed that 92% of doctors prescribe antibiotics without requesting culture and sensitivity test [7]. An earlier study done in Khartoum in 2012 revealed that 47.5% of doctors consider antibiotic resistance as a severe problem in their hospitals and the widespread use of antibiotics is the leading cause of it [8]. Another study done in Elobeid hospital in 2009 revealed that most doctors prescribe antibiotics empirically without committing to a local or national guidelines [9].

2. Methods

This descriptive questionnaire based-study was conducted among 50 general practitioners as a full coverage study in the internal medicine department of Elobied Teaching Hospital between 2020, February 27 and March 13. Elobeid teaching hospital resides in Elobied city, the capital of North Kordofan state, Sudan. It is a tertiary hospital that serves around 200 villages. Data were collected using a self-administered questionnaire. A standardized consent was made and provided with the questionnaire. Data were analyzed using the SPSS (version 23) and expressed in numbers and percentages.

3. Results

Out of 50 participants, 49 (98%) agreed that antibiotic resistance is a big progressive health threat worldwide and in Sudan, while one participant (2%) disagreed.

Regarding the common causes of antibiotics resistance, self-medication, incomplete dosage, over prescription, pharmaceutical dispensing of antibiotics without medical prescription, and poor antibiotics quality were chosen by 43 (86%), 41 (82%), 41 (82%), 38 (76%), and 12 (24%), respectively.

On questioning about possible preventive measures that helps to control and minimize the problem of antibiotics resistance, 49 candidates (98%) think that improvement of the availability and quality of culture and sensitivity tests in the hospitals will contribute in minimizing antibiotic resistance, 48 candidate (96%) believe in the rule of continuous training courses for medical staff, 47 (94%) believe in rule of health education for the community, 41 candidates (82%) believe in the necessity of establishment of local guidelines for

TABLE 1: Awareness of antibiotics resistance as a health threat.

	N	%
Agree	49	98%
Disagree	1	2%

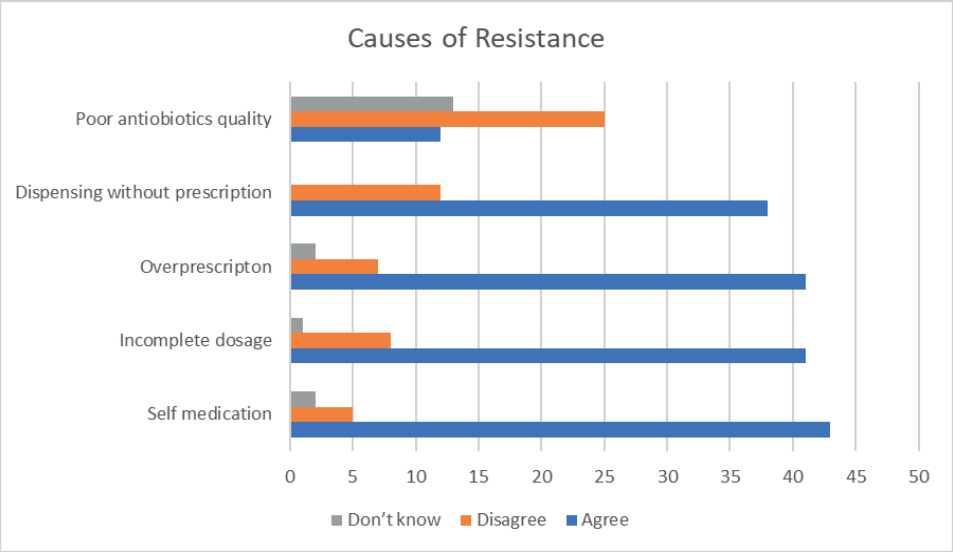

Figure 1: Awareness of common causes of antibiotics resistance.

antibiotics prescription, and 38 candidates (76%) believe in the necessity of creating laws to govern antibiotics dispensing.

Regarding the number of teaching sessions about antibiotics provided by each unit during the last year, 18 candidates (36%) received zero sessions, 26 (52%) received 1–5 sessions, 3 (6%) received 6–10 sessions, and 3 (6%) received >10 sessions.

Regarding the question about the sources of continuous learning about antibiotics, 47 participants (94%) agreed with senior colleagues as a good source, 43 (86%) agreed with websites, 39 (78%) agreed with the colleagues of the same level as a source, and 9 participants (18%) agreed with references like BNF as a good source.

4. Discussion

The vast majority of participants in this study agree that antibiotic resistance is a global and national health threat. This finding is consistent with studies held in Peru, France, and D.R Congo where respondents agreed that antibiotic resistance was an important problem nationally and internationally [10] .

Generally, the doctors show good awareness about the main causes and the main preventive measures of antibiotic resistance threat.

Moreover, 86%, 82%, 80.6%, 76%, and 24% doctors, respectively, reported self-medication, low or incomplete dosage, over prescription of antibiotics, pharmaceutical dispensing of antibiotics without medical prescription, and poor antibiotics quality as important causes. These results have a common denominator with the study done by Glasgow *et al.* which showed that 76.5% of physicians consider misuse of antibiotics to be the leading cause

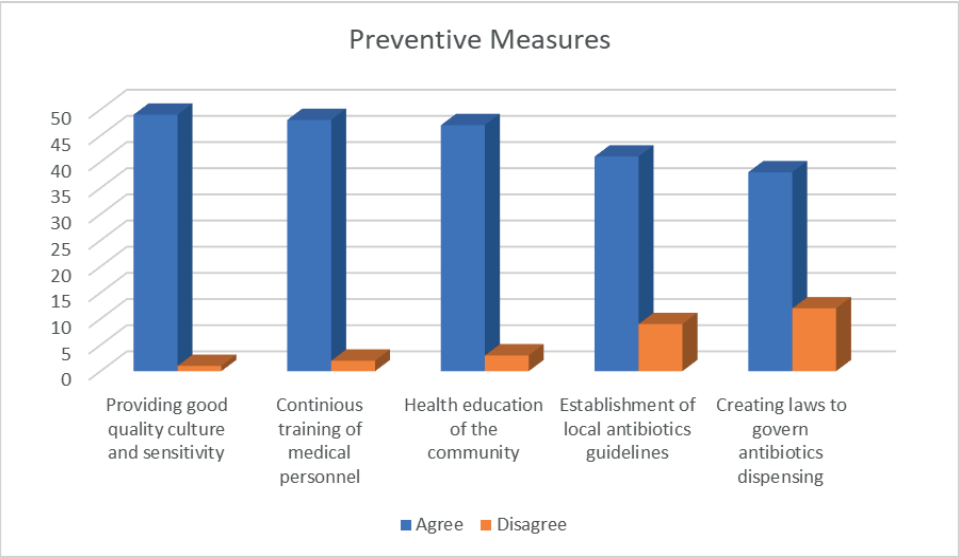

Figure 2: Possible preventive measures to combat antibiotics resistance.

TABLE 2: Number of teaching sessions provided by each unit/year.

Number of Teaching Sessions/Year	Frequency	%
0	18	36%
1–5	26	52%
6–10	3	6%
>10	3	6%

TABLE 3: Sources of knowledge about antibiotics.

		Frequency	Percentage
Valid	A	3	6.0
	A,B	4	8.0
	A,B,C	25	50.0
	A,B,C,D	6	12.0
	A,B,D	1	2.0
	A,C	7	14.0
	A,C,D	1	2.0
	B,C	1	2.0
	B,D	1	2.0
	C	1	2.0
	Total	50	100.0

A: senior colleagues, B: colleagues of the same level, C: websites, D: references.

of resistance [11]. Another study conducted by Alzoubi *et al.* showed that 85% of the participant pharmacists consider that using antibiotics without prescription is a leading cause [12].

Regarding preventive measures, providing good quality culture and sensitivity service, training courses for healthcare workers and undergraduate students, health education for the community, establishment of local guidelines for antibiotic

prescription, and creating laws to govern the pharmaceutical dispensing got 98%, 96%, 94%, 82%, and 76%, respectively. The second choice of preventive measures in our study is coinciding with the result achieved by Balliram *et al.* in which 91.22% of the participants emphasized that educational campaigns for medical personnel would combat AMR [13]. Poor quality of antibiotics is considered as an important cause of resistance globally [14], however, our survey showed low awareness about it (only 24% of participants).

Regarding departmental educational sessions provided by units, 36% receive zero sessions a year and 52% receive only 1–5 sessions a year. This reflects a relatively poor interest in teaching on antibiotics by leaders of the units which may considerably affect the overall knowledge and care of junior doctors about antibiotics and antimicrobial resistance.

Additionally, only 10% of the participants comply to *Sudanese Antimicrobials Guidelines*, 17% don't comply, and 56% did not even know about it. This result reflects a serious defect and lack of knowledge and commitment to local national protocols.

5. Conclusion

In summary, almost all doctors in this study agreed antibiotic resistance as a global and national health threat. They showed a good awareness about the main causes and good awareness of most preventive measures, relatively poor degree of education on antibiotics, and very poor adherence to the *Sudan Standard Treatment Guidelines*.

Recommendations

Improvement of microbiology LABs in hospitals, enhancement of educational programs on antibiotics, identifying and solving the problems between the doctors and *Sudan Standard Treatment Guidelines*, and more studies are highly recommended.

Acknowledgement

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Ethical Considerations

Ethical approval was waived by the institutional review board of our institute since the research is questionnaire based and didn't involve human subjects.

Competing Interests

The authors declare no conflict of interest.

Availability of Data and Material

The data and materials used in this study are available upon request from the corresponding author.

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