

Prevalence of Prescribing Antibiotics for Upper Respiratory Tract Infection among Primary Health Care Patients in Makkah, Al-Mukarramah, 1438 H

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ABSTRACT

Objectives: To estimate the prevalence of antibiotics prescribing for Upper respiratory tract infection (URTI) among primary health care patients in Makkah and to identify current patterns of antibiotic use and explore the factors for prescribing antibiotic in primary health care centres in Makkah.

Subjects and Methods: A Cross-sectional study among primary Health Care physicians in Makkah city. A sample of 134 physicians was included, (59%) females and (41%) males. The tool of the study was a self-administered questionnaire, which consists of two Parts: Demographic data and current pattern and factors of prescribing antibiotics.

Results: The study included 134 PHC physicians. Most of them (73.1%) had MBBS degree and only 25.4% had FM Board. More than half of physicians (59%) were prescribed antibiotics for 25% of the patients with URTI. The most common symptoms and signs which affect the physician's decision for prescribing antibiotics for URTI patients persistent fever over 3 days (50.7%), fever >38.5°C (50.7%), deteriorated general condition (54.5%). Over one month, a total of 40.4% of physicians were asked to prescribe antibiotics 1-4 times. Most physicians (86.6%) usually follow guidelines in prescribing antibiotics for patients with URTI.

Conclusion: This study showed that half of primary health care physicians prescribed antibiotics only for one-quarter of all URTI patients and the most common prescribed antibiotics were the amoxicillin. Exudates in the throat, inflamed eardrum, crepitation at lung auscultation, persistent fever over 3 days and fever >38.5°C significantly affected physicians' decisions to prescribe antibiotics for URTI.

Key word: URTI, Antibiotics, PHC, Physicians, Prevalence.

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INTRODUCTION

Antibiotics are powerful medications, but they are not the cure for all diseases. Also, known as antimicrobial drugs which play a role in the treatment of bacterial infections.¹ Since the early 1940s, antibiotics have been effectively treated a range of infections. Although these medications have saved millions of people, their capability is waning due to many reasons, including unnecessary prescribing by health care practitioners and improper use by patients, such as not taking the antibiotic as prescribed.²

The inappropriate use of antibiotics has contributed to one of the most critical public health problems in the world today which is antibiotic resistance.³ Consequences related to the overuse of

antibiotics include exaggerating the burden of chronic diseases, increasing costs of health services, and the development of unwanted adverse effects.⁴ Approximately 2 million patients become infected with bacteria that are resistant to antibiotics every year in the United States, and at least 23,000 of them die each year as a direct outcome of these infections.⁵

Upper Respiratory Tract Infection (URTI) defined as diseases caused by an acute infection involving the upper respiratory tract such as Pharyngitis, rhinosinusitis, and the common cold, one of the most common conditions in the primary care clinics for which antibiotic prescribing have been announced to be high around the

world. Antibiotics prescribed for more than 100 million adults, and 41% of these prescriptions are for respiratory conditions.^{6,7} National studies showed that the percentage of prescribing antibiotic for acute respiratory tract infections was high, although the majority of those cases were not bacterial infections and the most common diagnosis was the common cold.⁸⁻¹⁰ As well there was a Saudi study Showed that 352 parents of Saudi children. Most of the parents (71%) reported doctors as their source of antibiotic information. Only 1.4% of the participants identified all antibiotics correctly while 35.8% of them did not identify any antibiotic correctly.¹¹

URTIs considered being the most common infections in Saudi Arabia and the majority of these cases managed at primary health care units.^{12,13} National evidence-based guidelines do not recommend antibiotic prescription in the majority of URTI conditions.^{14,15}

Many studies suggesting little or no benefit from antibiotics for a sore throat, as URTIs are commonly viral infections^{15,16}, usually self-limiting, and rarely lead to critical complications.⁽¹⁶⁾ However, prescription of antibiotic in URTI cases still high for many reasons.⁷

National guidelines aim to deliver evident guidance on antibiotic prescription strategies for usual self-limiting diseases by providing evidence-based recommendations to minimize antimicrobial overuse in the society.^{17,18}

To the best of our knowledge, no studies conducted to investigate the factors that impact on prescribing antibiotics for upper respiratory tract infection in Makkah city.

This study aims to estimate the prevalence of antibiotics prescribing for upper respiratory tract infection among primary health care patients in Makkah and to identify current patterns of antibiotic use and explore the factors for prescribing antibiotic in primary health care centres in Makkah.

RATIONALE

Bad personal experience in the past for the wrong practices of antibiotics in the treatment of URTI.

SPECIFIC AIMS

This study was conducted to describe the current situation toward the attitude of prescribing antibiotic.

RESEARCH DESIGN AND METHODS

Study Design

A cross-sectional descriptive study.

Study Area

Makkah city is the center of the Islamic world and the birthplace of both the Prophet Muhammad and the religion he founded. It is located in a western area in the kingdom of Saudi Arabia. There are thirty Governmental Primary Health Care Centers inside Makkah city providing health care facilities (preventive, promotive, and curative services) for the all Makkah al-Mukarramah population registered in primary health care centers. This study was conducted in all the Primary Health Care (PHC) Centers in Makkah city.

Study Population

All physicians working in the Primary Health Care (PHC) Centers in Makkah city at the time of the survey were invited to participate in the study.

Sample Size

The total number was 156 physicians, 134 physicians included in the study and 22 excluded from the study according to eligibility criteria.

Time Period

Two-week period for data collection in November 2016.

Inclusion Criteria

All the physicians, Saudi and non-Saudi, males and females who work in the PHC centers in Makkah city at the time of the study were included in this study.

Exclusion Criteria

All physicians on vacation at the time of the study and who did not complete the form were excluded.

Data Collection Methods

A self-administered questionnaire was used. The questionnaire was taken from another similar study,⁽¹⁶⁾ and necessary modification was made to meet the objectives then validated from three family medicine consultant. It was completely written in the English language. It consists of two Parts: Demographic data and current pattern and factors of prescribing antibiotics. The questionnaires were distributed to participant doctors by data collectors. Then, they waited for them to fill all questions and they were collected again. Data were entered into a personal computer using google drive online form and Microsoft Excel.

Data Analyses

Statistical Package for Social Sciences (SPSS) for Windows version 16.0 was used for analysis. A chi-square tests (χ^2) analysis was performed for the association and/or the difference between two categorical variables. For all statistical tests done, P-value equal or less than 0.05 was considered statistically significant.

Ethical Considerations

Before conduction of the study, all necessary approvals were obtained.

RESULTS

A total of 134 PHC physicians were included in the current study. Their demographic characteristics are shown in the table (1). Slightly more than half of them (51.5%) were in the age group 30–39 years and 26.9% aged over 39 years. More than half of them (59%) were Females. More than half of them (62.7%) were non-Saudi nationals. Most of them (73.1%) had MBBS degree and only 25.4% had FM Board. 27 physicians had more than 15 years of experience in PHC (20.1%).

Figure (1) displays that more than 30 patients seen by slightly more than half of the physicians (51.5%) per day and more than 15 of them were URTI seen by over one-third of a physician (36.6%) as shown in the table (2).

As shown in the table (3), More than half of physicians (59%) were prescribed antibiotics for 25% of the patients with URTI. Approximately one-quarter of physicians (26.1%) were prescribed antibiotics for 50% of the patients with URTI, while about (14.9%) of them were prescribed antibiotics for 75% of the patients with URTI.

Figure (2) displays the majority of the physicians (70.9%) were prescribed Amoxicillin to URTI patients and (23.1%) of them were prescribed Amoxicillin + clavulanic acid. Persistent fever over 3 days, patient looking unwell, fever $>38.5^{\circ}\text{C}$ and deteriorated general condition constituted the most common symptoms which

affect the physician's decision "Probably Indicated" for prescribing antibiotics for URTI patients reported by 50.7%, 44.8%, 50.7% and 45.5% of physicians, respectively. Slightly less than half of physicians (47.8%) decided "Probably Not Indicated" for

prescribing antibiotics for URTI patients with the presence of a cough. While 42.5% of physicians decided "Definitely Not Indicated" for prescribing antibiotics for URTI when the patient needs a quick recovery to work as shown in the table (4).

Table 1: Demographic characteristics of PHC physicians (n=134)

Socio-demographic variables	Number	%
Age in years		
20-29	29	21.5%
30-39	69	51.5%
>39	36	26.9%
Gender		
Male	55	41.0%
Female	79	59.0%
Nationality		
Saudi	50	37.3%
Non Saudi	84	62.7%
Qualification		
Resident	98	73.1%
Specialist	34	25.4%
Consultant	2	1.5%
Years In Practice		
1-5	55	41.0%
6-10	37	27.7%
11-15	15	11.2%
>15	27	20.1%

Figure 1: Total patients seen by physicians per day (n=134)

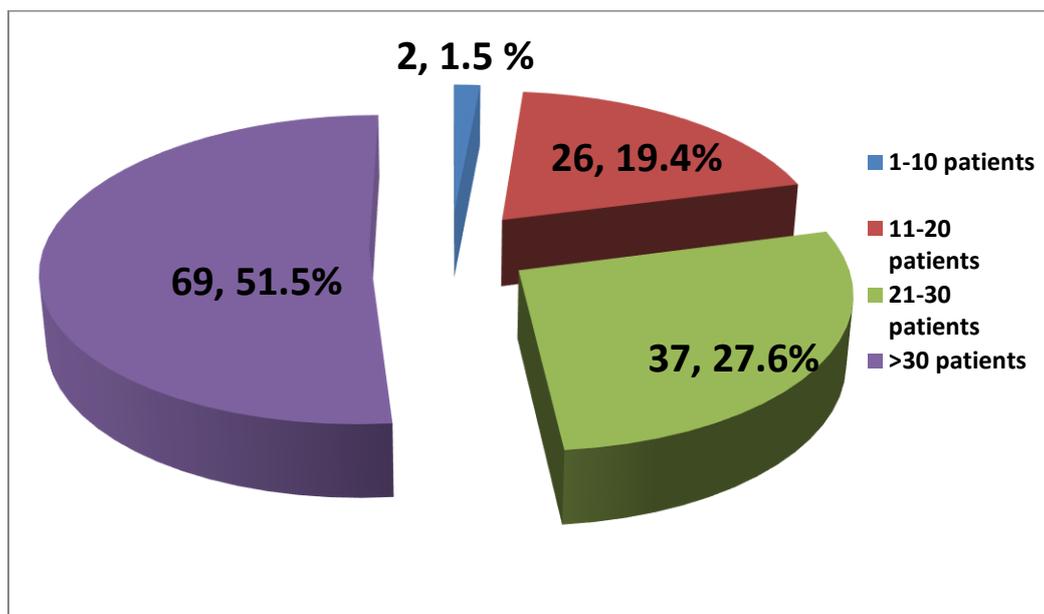


Table 2: Total patients with URTI seen by physicians per day (n=134)

Patients With URTIs	Number	%
1-5	16	11.9%
6-10	36	26.9%
11-15	33	24.6%
>15	49	36.6%

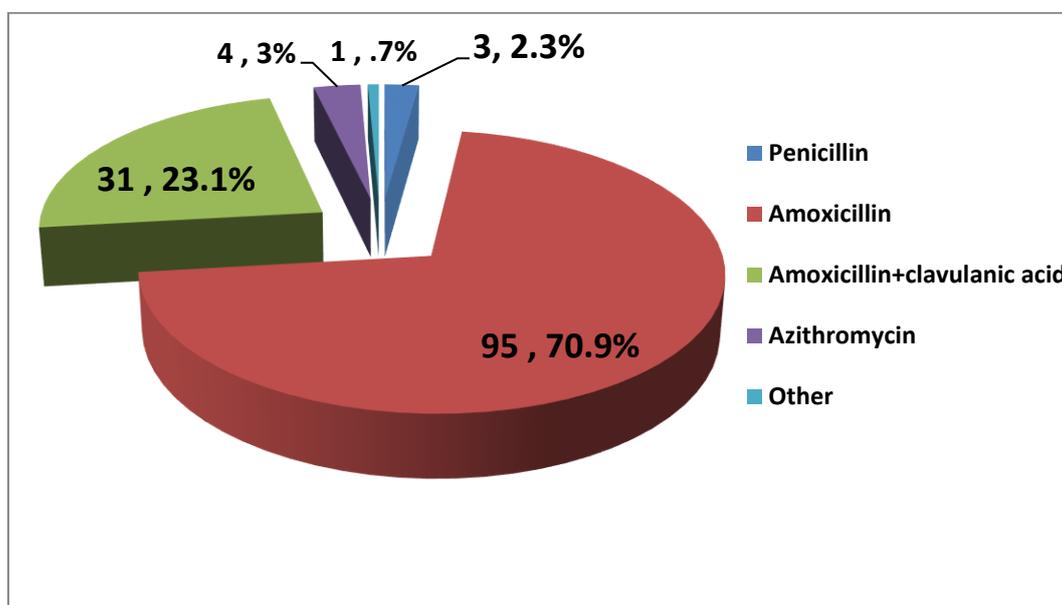
Table 3: Percentage of prescribing antibiotic for patients with URTI by PHC physicians (n=134)

Percentage of prescribing antibiotic	Number	%
25%	79	59.0%
50%	35	26.1%
75%	20	14.9%

Table (4): Symptoms that may affect physician's decision to prescribe antibiotics for URTI (n=134)

Symptom	Definitely indicated		Probably Indicated		Probably not indicated		Definitely not indicated	
	No.	%	No.	%	No.	%	No.	%
Persistent fever over 3 days.	36	26.9%	68	50.7%	24	17.9%	6	4.5%
Patient looking unwell.	22	16.4%	60	44.8%	36	26.9%	16	11.9%
High fever >38.5°C.	47	35.1%	68	50.7%	16	11.9%	3	2.2%
Deteriorated general condition.	51	38.1%	61	45.5%	19	14.2%	3	2.2%
Presence of cough.	11	8.2%	31	23.1%	64	47.8%	28	20.9%
Patient needs quick recovery for work.	10	7.5%	26	19.4%	41	30.6%	57	42.5%

Fig 2: The most common antibiotics prescribed to URTI patient by PHC physicians (n=134)



As shown in the table (5), Exudates in the throat and crepitation at lung auscultation constituted the most common signs which affect the physician's decision "Definitely Indicated" for prescribing antibiotics for URTI patients reported by 64.9% and 50.7% of physicians, respectively. While inflamed eardrum, purulent nasal discharge, cervical lymphadenopathy, Ronchi at lung auscultation and reducing vesicular breathing constituted the most common signs which affect the physician's decision "Probably Indicated" for prescribing antibiotics for URTI patients reported by 52.2%, 44.8%, 42.5%, 40.3% and 43.3% of physicians, respectively. Non-clinical factors such as patient ask for antibiotics, patient expects antibiotics According to you, work under pressure and won't see patients again had a strong effect on physician's decision "Definitely Not Indicated" to prescribe antibiotics for URTI reported by 57.5%, 38.8%, 50.0%, and 47.0%, respectively. While about 40.3% of physicians decided that it is "Probably Indicated" to prescribe antibiotics for URTI when the Patient Will Already Reconsult within two days if not better or not prescribed antibiotics as shown in the table (6).

A total of 40.4% of physicians was asked to prescribe antibiotics 1-4 times over one month. About 21.6 % of physicians were asked to prescribe antibiotics 5-9 times and 27.6% of them were asked to prescribe antibiotics 10 or more times. Only 10.4% of physicians never goes with the request as shown in the table (7). About 40.3% of physician rarely prescribing antibiotics when a patient requests, and around one quarter, 24.6% of them sometimes prescribing antibiotics when a patient requests. Only 59% of physicians always advise patients on simple self-management. A total of 70.6% of physicians always and sometimes advise patients on simple self-medication as shown in the table (8). The most important program suggested for reducing inappropriate oral antibiotic use for URTI was patient education by 73.9% of physicians, followed by more careful criteria for diagnosis by 18.7% of physicians as shown in the table (9). Figure (3) displays the majority of physicians (86.6%) were following guidelines in prescribing antibiotics for patients with URTI.

Table (5): Signs that may affect physician's decision to prescribe antibiotics for URTI (n=134)

Sign	Definitely indicated		Probably Indicated		Probably not indicated		Definitely not indicated	
	No.	%	No.	%	No.	%	No.	%
Purulent nasal discharge.	33	24.6%	60	44.8%	26	19.4%	15	11.2%
Exudates in throat.	87	64.9%	38	28.4%	8	6.0%	1	0.7%
Inflamed eardrum.	51	38.1%	70	52.2%	11	8.2%	2	1.5%
Cervical lymphadenopathy.	57	42.5%	57	42.5%	16	11.9%	4	3.0%
Crepitation at lung 22uscultation.	68	50.7%	49	36.6%	11	8.2%	6	4.5%
Ronchi at lung 22uscultation.	36	26.9%	54	40.3%	35	26.1%	9	6.7%
Reducing vesicular breathing.	29	21.6%	58	43.3%	41	30.6%	6	4.5%

Table (6): Impact of non-clinical factors on decisions to prescribe antibiotics (n=134)

Factors affecting the decision to prescribe antibiotics.	Definitely indicated		Probably Indicated		Probably not indicated		Definitely not indicated	
	No.	%	No.	%	No.	%	No.	%
The Patient asks for antibiotics.	10	7.5%	9	6.7%	38	28.3%	77	57.5%
The Patient expects antibiotics according to you.	8	6.0%	25	18.7%	49	36.6%	52	38.8%
The Patient will Already Reconsult within two days if not better or not prescribed antibiotics	14	10.4%	54	40.3%	46	34.3%	20	14.9%
Work under Pressure	9	6.7%	28	20.9%	30	22.4%	67	50.0%
won't see patients again	9	6.7%	20	14.9%	42	31.3%	63	47.0%

Table (7): Frequency of patient request of antibiotic for URTI during past month (n=134)

Time of request in the past month	Number	%
No Request	14	10.4%
1-4 times	54	40.4%
5-9 times	29	21.6%
10 or more times	37	27.6%

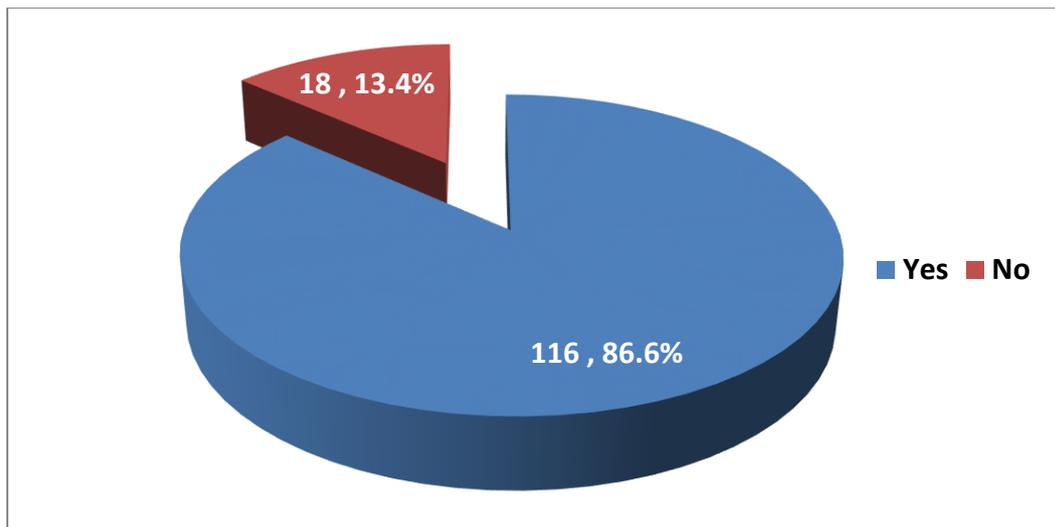
Table (8): Response of physicians to patient's request and advice (n=134)

Percentage of prescribing antibiotic For Patients with URTIs	Always		Sometimes		Rarely		Never	
	No.	%	No.	%	No.	%	No.	%
The physician prescribes antibiotics when requested by a patient.	5	3.7%	33	24.6%	54	40.3%	42	31.3%
The physician advises patient on simple self-management.	79	59.0%	34	25.4%	12	9.0%	9	6.7%
The physician advises patient on simple self-medication.	48	35.8%	48	35.8%	17	12.7%	21	15.7%

Table (9): Physician's suggestion on the most single important program for reducing inappropriate oral antibiotics use for URTI (n=134)

Program	Number	%
More careful Criteria For Diagnosis	25	18.7%
Reduce Legal Liability	10	7.5%
Educate Patient About Appropriate Indication	99	73.9%

Figure (3): percentage of physicians who follow guidelines to prescribing antibiotics for URTI (n=134)



DISCUSSION

Our cross-sectional descriptive study in Primary health care represents 134 physicians in Makkah Al- Mukarramah about 98 residents, 34 specialists and two consultants. However, this is not the first study indicating prevalence regards to prescribe antibiotics for URTI.

Regarding symptoms that may affect the physician's decision to prescribe antibiotics for URTIs, such as high fever >38.5, exudates in throat, crepitation at lung auscultation, and so many other signs as mentioned before.

According to cross-tabulation in this study among consultants, residents and specialists, we found that patients who need quick recovery for work and patients with presence of cough are definitely non-indicated for prescribing an antibiotic by the majority of physicians with the highest percentage.

This result is the same as another study in Al-Khober Area, which showed determinants of Antibiotics Prescribing for Upper Respiratory Tract Infections among Primary Health Care Physicians.

In this study consultants decide to probably not be indicated/indicated an antibiotic for patients whose have a cough while other physicians decide to prescribe an antibiotic for them.

Moreover, patients with high fever > 38.5, or deteriorated in general condition, or crepitation at lung auscultation and patients with Inflamed Eardrum are the most conditions that consultants were non-indicated an antibiotic while other physician's residents and specialists have minor variations regards to consultants' decision.

Our cross-tabulation study showed that nearly patients with Exudates in throat and crepitation at lung auscultation more than 50% are definitely indicated an antibiotic.

Additionally, high fever and inflamed eardrum are from the most conditions that affect the physician decision to prescribe an antibiotic. This result as well is conformed when compared to Al-Khobar study.

Also, our study showed that the highest percentage of sign/symptom that absolutely indicated to prescribe an antibiotic is patient with exudates in the throat, most physicians in primary health care in Makkah al-mukarramah have the same decision with percentage of 65% surely indicated an antibiotic and 28%

probably indicated an antibiotic with a total of 93% while only 1% is not to indicate an antibiotic. This result is very conformed to Al-Khobar study.

In addition, a total of 86% of physicians decided to probably be indicated\ definitely indicated an antibiotic for patients with Cervical Lymphadenopathy.

Whatever, our cross-tabulation study showed also the most antibiotic have been used in primary health care in Makkah Al-Mukarramah is amoxicillin with a percentage of 71%.

In the same study, slightly most of the physicians were asked to prescribe antibiotics. Only 10.4% of physicians never goes with the request as we mentioned in our results.

In addition, approximately 86.6% majority of physicians were following guidelines in prescribing antibiotics for patients with URTI in PHC centers.

In conclusion, this study has documented many areas in which physician's knowledge on antibiotic use for URTI is considerably good, resulting in professional practicing.

And this study assessed the importance of antibiotics prescription for URTIs among primary health care physicians in Makkah Al-Mukarramah and the factors that might affect such behaviors.

According to the physicians' opinions, the symptoms and the clinical signs were the most important factors that affecting the physicians' decision to prescribe antibiotics.

CONCLUSIONS

This study showed that half of primary health care physicians prescribed antibiotics only for one-quarter of all URTI patients and the most common prescribed antibiotics were the amoxicillin. Exudates in the throat, inflamed eardrum, crepitation at lung auscultation, persistent fever over 3 days and fever >38.5°C significantly affected physicians' decisions to prescribe antibiotics for URTI. Inappropriate antibiotic prescribe in the primary care centers need for more concerted interventions targeting physicians as well as general public. Improvement strategies should focus on reducing inappropriate prescribing. This should include simultaneous education of the public and primary health care physicians via the mass media, professional societies and within the clinic setting.

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