



Outpatient Doxycycline Therapy: Frequency of Its Use and Its Prescribing Patterns in a Public Hospital

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Author's contribution

The sole author designed, analysed, interpreted and prepared the manuscript.

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ABSTRACT

Aim: The aim of this study was to identify the outpatient doxycycline therapy: Frequency of its use and its prescribing patterns in a public hospital.

Methodology: This was a retrospective study which was conducted in a public hospital in Alkharj City in 2018. The outpatient prescriptions were reviewed to evaluate the prescription patterns of Doxycycline.

Results: The study results found that about 48.38% of the patients were female and about 62.90% were from Saudi Arabia. Doxycycline was prescribed mainly by resident physicians. Doxycycline was prescribed mainly in the emergency department followed by obstetrics & gynecology department.

Conclusion: Doxycycline was prescribed infrequently in the outpatient settings; it is reserved only for specific conditions. It is important to use antibiotics wisely by the patients and to prescribe and dispense antibiotics including doxycycline appropriately by health care professionals.

Keywords: Outpatient; doxycycline; frequency; prescribing patterns.

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1. INTRODUCTION

Antibiotics are drugs used to treat or to prevent infections caused by bacterium. Antimicrobial resistance occurs when microbes such as bacteria, fungi, parasites and viruses change in ways that render the medications used to treat the infections they cause ineffective. When the germs become resistant to most antimicrobials they are often called “superbugs”. Antibiotic resistance results in higher medical costs, long hospital stays, and increased the mortality rate. [1,2].

Centers for Disease Control and Prevention (CDC) reported that in 2015 alone, about 269 million antibiotic prescriptions were dispensed in the United States from outpatient pharmacies [3]. At least 30 percent of these antibiotic prescriptions were needless [4].

Doxycycline is a second-generation tetracycline, available globally since 1967. It has high tissue and fluid penetration and an excellent bioavailability. It is a bacteriostatic antibiotic that acts on the ribosomal protein synthesis unit [5].

Doxycycline is used in the treatment of several conditions or diseases including rickettsial infections, sexually transmitted infections, respiratory tract infections, ophthalmic infections, anthrax including inhalational anthrax (post-exposure), alternative treatment for selected infections when penicillin is contraindicated, adjunctive therapy for acute intestinal amebiasis and severe acne, prophylaxis of malaria and for the treatment of other specific bacterial infections [6].

Major side effects of doxycycline are dermatological and gastrointestinal and it is generally contraindicated in childhood or in pregnancy because it could cause potential effects on growing bones and could cause discoloration of developing teeth [7].

To reduce the development of drug-resistant bacteria and maintain the effectiveness of doxycycline and other antibacterial drugs, doxycycline tablets should be used only to treat or prevent infections that are proven or strongly suspected to be caused by bacteria [8].

CDC now is working to promote the suitable use of antibiotics by helping prescribers to use the right antibiotic to the right patient, at the right time, right dose and for the right duration in order to decrease the unnecessary use of antibiotic [3].

Although, it is important to characterize trends in outpatient antibiotic prescriptions. There are limited data on the trends for individual antibiotics and on the usage of individual antibiotics in association with specific indications. Therefore, the aim of this study was to identify the outpatient doxycycline therapy: Frequency of its use and its prescribing patterns in a public hospital.

Research question: What is the prescribing pattern and frequency of doxycycline therapy?

2. METHODOLOGY

This is a retrospective study; hospital-based records were utilized to meet the aim of this study. It that was conducted in a public hospital in Alkharj City. The outpatient prescriptions were reviewed from the patients' medical records to evaluate the frequency and prescription patterns of doxycycline. The inclusion criteria include all outpatient prescriptions that contains doxycycline in 2018.

The exclusion criteria include the prescriptions in inpatient setting, the prescriptions before or after 2018 and the prescriptions that don't contain doxycycline.

The data were collected and analyzed using Excel Software, the descriptive data were represented by frequencies and percentages.

This study was approved by the ministry of health Institutional Review Board log number 18-474E.

3. RESULTS

In 2017, 85 Tetracycline class antibiotics were prescribed and included 24 tetracycline and 61 doxycycline prescriptions. In 2018, 117 tetracycline class antibiotics were prescribed and included 55 tetracycline and 62 doxycycline prescriptions.

All of the tetracycline drugs were prescribed as an eye ointment and all of the doxycycline drugs were prescribed as a capsule dosage form. The medical record of 2017 don't contain demographic data but the medical records of 2018 contains personal data for the patients. The majority of the patients in 2018 were in the age of 20-39 (64.52%). Table 1 shows the age of the patients who received doxycycline in 2018.

Table 1. The age of the patients who received doxycycline in 2018 (n=62)

Age	Number of doxycycline prescriptions	Percentage of doxycycline prescriptions
10-19	4	6.45
20-29	23	37.10
30-39	17	27.42
40-49	10	16.13
50-59	6	9.68
60-69	2	3.22

Table 2. Personal data who received doxycycline in 2018 (n=62)

Variable	Category	Number	Percentage
Gender	Male	32	51.61
	Female	30	48.39
Nationality	Saudi	39	62.90
	Non- Saudi	23	37.10

Table 3. The level of prescribed physicians (n=62)

	Number	Percentage
Consultant	12	19.35
Resident	43	69.36
Specialist	7	11.29

Table 4. The departments that prescribed doxycycline in 2018 (n=62)

Departments	Number	Percentage
Dermatology	9	14.51
Emergency	18	29.03
Infection Control	2	3.22
Infectious diseases	7	11.29
Internal Medicine	3	4.83
Obstetrics & Gynecology	13	20.96
Ophthalmology	2	3.22
Pediatrics	1	1.61
Urology	7	11.29

About 48.39% of the patients were female and about 62.90% were from Saudi Arabia. Personal data were shown in Table 2.

Doxycycline was prescribed mainly by resident physicians (69.36%). Table 3 shows the level of the physicians.

Doxycycline was prescribed mainly in the emergency department (29.03%) and obstetrics & gynecology department (20.96%). Table 4 shows the departments that prescribed doxycycline.

4. DISCUSSION

In this study, the prescribing rate of tetracycline antibiotics doxycycline and tetracycline was very low. This result is rational due to the availability

of more tolerable antibiotics with decreased side effects as reported by previous studies. Brookoff reported that regarding the rate of compliance with doxycycline therapy for outpatient management of pelvic inflammatory disease, only 31% of the women reported complete compliance and reported that the most common reasons given for not filling prescriptions were inconvenience, cost and resolution of symptoms [9]. In another study David L. et al reported that the rate of compliance with daily doxycycline was poor and that side effects were attributed to doxycycline by 32.8% of the respondents [10].

Moreover, Bryant et al. [11] make a comparison between ampicillin, doxycycline, penicillin VK and tetracycline and indicated that at least a 3-fold higher frequency of vomiting or nausea with

doxycycline relative to other antibiotics. Additionally, he indicated also that at least 4 -fold higher frequency of skin rash with doxycycline relative to other antibiotics.

On the other hand, Sharon et al. [12] reported that Long-term use of doxycycline appears safe and could be use if needed for large-scale post-exposure anthrax prophylaxis. Furthermore, Smith and Leyden [13] stated that then incidence of adverse effects of doxycycline is very low.

Another reason for decreased use of doxycycline related to the efficacy in some situations. For example, Patricia van Velzen [14] reported that for the treatment of exacerbation of patients with mild-to-severe chronic obstructive pulmonary disease (COPD) in an outpatient setting, the addition of doxycycline to prednisolone didn't prolong time to next exacerbation compared with prednisolone alone and reported that this finding doesn't support the prescribing of antibiotics for COPD exacerbations in an outpatient setting.

Another study also reported the low rate of prescribing doxycycline conducted by Christopher J. Smith [15] who reported that doxycycline was prescribed by 9% of rheumatologists for rheumatoid (RA) patients and said that rheumatologists have not embraced doxycycline as primary treatment option for RA and should reserve its use primarily in patients with long- standing, refractory disease.

Additionally, Habib Farooqui et al. [16] reported that beta lactam antibiotics were the most prescribed antibiotics in the outpatient setting and reported that tetracycline was antibiotics prescribed in a low rate. Other study conducted by Nehad Ahmed et al. [17] in the outpatient pharmacies reported that penicillin followed by cephalosporins were the most prescribed and that only 1.94 of the prescriptions contain a tetracycline antibiotic.

In this study doxycycline was prescribed mainly by emergency followed by gynecology and dermatology departments, and this is rational because it is prescribed mainly to treat respiratory tract infections that were common in emergency department and it is prescribed for treating several genitourinary infections and to treat acne. Moreover, it was prescribed mainly by resident physicians with inadequate experience, this may increase the medication errors and the drug therapy problems.

5. CONCLUSION

Doxycycline is prescribed infrequently in the outpatient settings; it is reserved only for specific conditions. Generally, it is well tolerated but could results in some side effects. It is important to use antibiotics wisely by the patients and to prescribe and dispense antibiotics including doxycycline appropriately by health care professionals. It is important also to increase the awareness regarding antibiotics including doxycycline by attending conferences, workshops, and lectures and by preparing posters and brochures.

CONSENT

As per international standard or university standard written patient consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

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COMPETING INTERESTS

Author has declared that no competing interests exist.

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