Original Article

Self-medication with antibiotics by the community of Abu Dhabi Emirate, United Arab Emirates

Abobakr Abasaeed[1,2], Jiri Vlcek[1], Mohammed Abuelkhair[3], Ales Kubena[1]

[1] *Department of Social and Clinical Pharmacy, Faculty of Pharmacy, Charles University, Hradec Kralove, Czech Republic*
[2] *Drug Control Department, Ministry of Health, Abu Dhabi, United Arab Emirates*
[3] *Health Authority, Abu Dhabi, United Arab Emirates*

Abstract

Background: Self-medication with antibiotics may increase the risk of inappropriate use and the selection of resistant bacteria. The objective of the study was to estimate the prevalence of self-medication with antibiotics in Abu Dhabi.

Methodology: A validated, self-administered questionnaire was used to collect data. Data were analysed using descriptive statistics, and the chi-square test when applicable. One thousand subjects were invited to participate in the study.

Results: Eight hundred sixty questionnaires were completed, with a respondent rate of 86%, consisting of 66% males and 34% females. Among the 860 participants, 485 (56%) reported the use of antibiotics within the last year. Amoxicillin was the antibiotic most commonly used (46.3%). The survey showed a significant association between antibiotics used and age group ($p < 0.001$). Of the participants surveyed, 393 (46%) stated that they intentionally use antibiotics as self-medication without a medical consultation, a behavior that is significantly affected by educational levels ($p < 0.001$). Two hundred forty-five (28%) participants stored antibiotics at home. These antibiotics were mostly acquired from community pharmacies without prescriptions ($p < 0.001$).

Conclusions: The results of this study confirm that antibiotic self-medication is a relatively frequent problem in Abu Dhabi. Interventions are required in order to reduce the frequency of antibiotic misuse.

Keywords: Self-medication, antibiotics, rational use

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Introduction

Efforts to promote the rational use of drugs have mainly been targeted at the formal health care services. These efforts started in the 1970s, when the World Health Organization (WHO) introduced the concept of essential drugs. The principle of this concept is that a limited number of drugs would lead to a better supply of these drugs, better prescribing, and lower costs for health care. Despite the introduction of the essential drug list in over 100 countries, drug consumption still increased worldwide [1]. It can be argued that antimicrobials have done more to improve public health in the last 50 years than any other measure, but conversely it is estimated that the volume of the antibiotic market worldwide is between 1 and 2 x 10^8 kg of products [2].

It is well documented that the indiscriminate use of antibiotics has led to hospital, waterborne and food-borne infections by antibiotic-resistant bacteria, enteropathy (irritable bowel syndrome, antibiotic-associated diarrhoea etc.), drug hypersensitivity, biosphere alteration, human and animal growth promotion, and destruction of fragile interspecific competition in microbial ecosystems [3]. The consequences are severe; infections caused by resistant microbes fail to respond to treatment, resulting in prolonged illness and a greater risk of death. Treatment failures also lead to longer periods of infectivity, which increase the numbers of infected people moving in the community and thus expose the general population to the risk of contracting a resistant strain of bacteria [4].

Self-medication can be defined as the use of drugs to treat self-diagnosed disorders or symptoms, or the intermittent or continued use of a prescribed drug for chronic or recurrent disease or symptoms [5,6]. Drug regulations that affect the availability of antibiotics are implemented differently in different countries and can play an important role in misconceptions about the use of antibiotics [7]. In addition, regulations (and their enforcement) also vary for the dispensation of prescription antibiotics. For example, common self-medication with

Figure 1.


100 capsules
Pencloxin®
500 mg
Lagap SA, Vez
CECLOR®
Cefaclor For Oral Suspension
250 mg
per 5 ml
KLAVOX
Gloclav® 375
NORACIN
400 mg.
CIPROGEN®
Ciprofloxacin
500 Film Coated Tablets
Augmentin
375mg
Julmentin
Ciprobay® 500
ciprofloxacine
Antibiotique à large spectre
EQUIVALENT TO
500 mg anhydrous cefp
CEFZIL* (Cefprozil)
Film-Coated Tablets
Amoxil
Avalox®
Zinnat
Trade mark
tablets 250 mg
JULPHAMOX 500 mg
جلفاموكس ٥٠٠ ملغم
SPORIDEX® 500
CEPHALEXIN CAPSULES BP
20 capsules
Ospen® 500
Phenoxymethylpenicillin
Potassium B.P. 500,000 IU
30 film-coated tablets
comprimés enrobés
tabletas con película
CIPROLET 500
500
1 x 10's
Clamycin
Clarithromycin
14 Film-coated tablets
500 mg
B402085B
BIOCHEMIE
SUPRAX® 200
TETRACYCLINE
ERYTHROCIN®
GRANULES
200 mg per 5 ml
7 tablet calendar pack
KLACID® XL
ZITHROMAX
AZITHROMYCIN
20 Tablet Calendar Pack
No L214
KLACID® 500
ABBOTT

Table 1. Distribution of demographics characteristics within the study population

Respondents' characteristics	Distribution of total No. of respondent [a/]	Distribution of respondent reported antibiotic use [b/]	*p*- value within those reported antibiotic use
Gender			
0.134			
Male	566 (65.8%)	332 (68.5%)	
Female	294 (34.2 %)	153 (31. 5 %)	
Age			
0.001			
20 – 29	238 (27. 7 %)	100 (20.6 %)	
30 - 39	331 (38 . 5 %)	179 (36. 3 %)	
40 - 49	222 (25. 8 %)	159 (32.8 %)	
50>	69 (8 . 0 %)	50 (10. 3 %)	
Education			
0.023			
Primary	163 (20.1%)	80 (16.4%)	
Secondary	191 (22.2 %)	112 (23.2%)	
University & Postgraduates	496 (57.5 %)	293 (60.4)	

*****100% of respondents = ad a/ = 860, ad b/ = 485

antibiotics in Spain may be a consequence of poor enforcement and control over the laws and regulations influencing prescription, which has a knock-on effect upon community pharmacy services [8]. Another survey showed significant differences in public attitudes, beliefs and levels of knowledge concerning antibiotic use, self-medication and antibiotic resistance in Europe. Overall, only half of the respondents were aware of antibiotic resistance and this awareness was the lowest in countries with a higher prevalence of resistance [7].

The United Arab Emirates (UAE) is a federation of seven gulf emirates with an estimated population of 4.1 million people of different ethnic groups (80% are expatriates) [9]. The gross national product per capita is $32,000 [10]. Standards of health care in the UAE are generally high, reflecting the high level of public spending over the decades since the oil boom. Better health provision has been reflected in rapidly improving figures for key indicators, such as life expectancy and infant mortality rates, which are now at western levels [9]. According to the national antibiotics policy and guide to antimicrobial therapy [11], antimicrobials should only be sold or supplied by prescription from an authorized medical practitioner or dentist. In this policy, for the purposes of rational use, antimicrobials are classified into three groups according to the level of prescription:

Group A: For common use, all practitioners may prescribe them (safe, effective and relatively cheap)

Group B: Restricted use; for prescription by specialists only (expensive, toxic and new agents)

Group C: For use in primary health care (similar to group A), with some omissions [11].

Our literature review revealed that there are no published studies that address self-medication with antibiotics by the community in the United Arab Emirates; hence our study is a first for this region.

Methods

A descriptive, cross-sectional study was conducted during the 16th Abu Dhabi International Book Fair in April 2006. The aim of the study was to estimate the prevalence of self-medication with antibiotics in Abu Dhabi. Data were collected through a structured, validated, self-administered questionnaire.

Selection of the participants was based on systematic random sampling; every 35th visitor was chosen and verbal consent was obtained after a briefing on the objectives of the study. The questionnaire collected demographic data such as age,

Table 2. Frequencies of used antibiotics

No	Name of ATB	No. Of Used Courses by adults n=485(100%)	No. Of Used Courses by children n=360 (100%)
1	Amoxicillin	226 (46 . 6 %)	**252 (70%)**
2	Augmentin	116 (23. 9 %)	**39 (10.8%)**
3	Erythromycin	14 (2.9%)	**10 (2.8 %)**
4	Tetracycline	31 (6. 4 %)	**7(1.9%)**
5	Clarithomycin	12(2.5%)	**4(1.1%)**
6	Azithromycin	31 (6.4%)	**19 (5.3 %)**
7	Ciprofloxacin	4(0.8%)	**-**
8	Cotrimox	15(3.1%)	**6(1.7%)**
9	Norfloxacine	20 (4.1%	**-**
10	Cefuroxime	10(2.1%)	**13 (3.6 %)**
11	Cefixime	6(1.2%)	**5(1.4 %)**
12	**Cefaclor**	**-**	**5(1.4%)**

gender, and level of education of the participants. Respondents were asked whether they had used antibiotics during the past year and were shown a portrait containing labels from the available types of antibiotics in health premises to help them remember which these were (Figure 1). Participants who confirmed antibiotic usage were asked why and how they obtained the antibiotics, whether they were storing any antibiotics at home, and if they intended to use them personally or for their children without a doctor's prescription.

The collected data were pooled and analysed using SPSS version 11.0. Descriptive statistics were used, and the chi-square test was used when applicable.

Results

Out of 1,000 invited visitors, 860 agreed to participate in the study, a respondent rate of 86%. Males represented 66% of the participants, while females represented 34%. Participant age and educational levels are presented in Table 1. Among the 860 participants, 485 (56%) reported antibiotic use during the last year (68.5% male, 31.5 % female). Antibiotic use was significantly affected by age ($p < 0.001$) and educational level ($p = 0.023$) but not by gender ($p = 0.045$).

The frequencies of antibiotics used are presented in Table 2. Amoxicillin was the antibiotic most commonly used by the participants and their children (46.3% and 70% respectively), followed by amoxicillin-clavulanate (23.9%, 10.8%), while ciprofloxacin and norfloxacin were used only by adult participants.

Within the 485 participants who reported antibiotic use, 270 (56%) obtained their antibiotics with a prescription either from a physician or a dentist, while the remainder (115, 44%) acquired their antibiotics without prescription as self-medication (see Table 3). Statistical analysis showed that the method of obtaining antibiotics is significantly affected by the age of the participants ($p = 0.014$).

Table 3. Source of obtaining antibiotics

Source	Adults n=485(100%)	Children n=360 (100%)
Physician	222(25.8%)	196(54.4%)
Dentist	48(5.6%)	40(11.1%)
OTC from Community pharmacy	140(16.3%)	89(24.7%)
OTC from abroad	56(6.5%)	28(7.8%)
Left over	19(2.2%)	-

Table 4. Frequencies of common reasons for which antibiotics were used

Reason	Adults n=485(100%)	Children n=360(100%)
Influenza	157(32.4%)	159(44.2%)
General infection	119(24.4%)	66(18.3%)
Toothache	60(12.4%)	61(16.9%)
Upper respiratory	32(24.4%)	14(3.9%)
Gastrointestinal	26(5.4%)	12(3.3%)
Ear infection	11(2.3%)	27(7.5%)
Genitor-urinary	36(7.4%)	-

Table 5. Storing antibiotics at home

Respondents' characteristics	antibiotics home with prescription	antibiotics home without prescription	*p*- value
Gender			**0.001**
Male	0(0%)	151(63.7%)	
Female	8(100%)	86(36.3%)	
Age			**0.002**
20 – 29	5 (62.5%)	33 (13.9 %)	
30 - 39	1 (12.5%)	89 (37.6 %)	
40 - 49	1 (12.5%)	91 (38.4 %)	
50>	1 (12.5%)	24 (10.1 %)	
Education			**0.321**
Primary	2(25%)	35 (14.8%)	
Secondary	0 (0 %)	48 (19.6%)	
University & Postgraduates	6 (75 %)	160(65.3%)	

Among the 360 parents who confirmed antibiotic use for their children, we found that 236 (66%) received antibiotics through a prescription while 124 (34%) did not (Table 3). The most common reasons for which antibiotics were used are displayed in Table 4. Of all participants, 393 (46%) stated that they intentionally use antibiotics as self-medication without a medical consultation, which is significantly affected by the educational level of the participant ($p < 0.001$: higher level of education associated with an increased use of self medication).

Two hundred forty-five (28%) of all participants declared that they were keeping antibiotics at home, mostly acquired from the community pharmacies without a prescription. A significant association between the behavior of keeping antibiotics at home and age ($p = 0.002$) was found, with males also significantly more likely exhibit this behavior (151 males, $p < 0.001$).

Discussion

Despite the UAE's antimicrobial policy that restricts the dispensation of antibiotics without prescription, our study indicates the wide availability of these agents over the counter and reveals the high prevalence of self-medication with antibiotics.

Antibiotics were used by 56.3% of the study population. This rate is fairly high compared with results conducted in the Czech Republic (31.1%), Jordan (23.0%), and Lithuania (39.9%) [12,13,14]. In Lithuania, women tended to use more antibiotics than men, while in our study the antibiotic usage was not associated with gender, but was significantly affected

by age and educational level. Because we do not have sufficient information about the spread of infectious disease in UAE, we cannot determine whether the geriatric patients were more frequently sick or if they resorted to self-medication, so it would be advisable to monitor aspects such as resistance and sensitivity.

The high prevalence of self-medication that was found within the adult participants (44%) and their children (34%) could be explained by a number of factors, including the nature of the UAE community, which comprises different nationalities. The majority are from India, the Philippines, Pakistan and different Arab countries, where the prevalence of self-medication is also high: India 18%, Sudan 48% and Jordan 40% [15,5,13]. This observation suggests that traditional, social and cultural factors influence self-medication with antibiotics, despite these being prescription-only medicines in the UAE. Another contributing factor is the ease with which antibiotics can be acquired from the community pharmacies, which in turn is related to a lack of high disciplinary regulations. The antimicrobial policies in the UAE comprise no distinct clauses or articles that stipulate any sort of punitive procedures or punishments against violating pharmacists, who dispense antibiotics without medical prescriptions issued by licensed physicians.

In concordance with reported results from studies in Sudan, Jordan and Greece [5,13,16], amoxicillin was the most commonly chosen antibiotic for self-medication. Other antibiotics that were used included amoxicillin-clavulanate, macrolides, quinolones, and tetracycline.

As stated by the participants of our study, influenza was the major reason for treatment with prescribed or self-medicated antibiotics. This finding, though consistent with results of other studies [13,14,17], also indicates the belief of the community that antibiotics can treat and eradicate any infections irrespective of their origin. It also revealed that the participants were unaware of the dangers and consequences of inappropriate use of antibiotics.

Despite its highly harming photosensitivity, our results revealed the inappropriate and irrational use of tetracycline in treating gastrointestinal problems. This is a practice which is in discordance with published guidelines, which state the drug is to be used in combination with other medicines to manage food-borne illnesses caused by various bacteria (e.g. *Brucella abortus*, *Vibrio cholera* and *Vibrio vulnificus*) [18] or following initial *H. pylori* treatment failure (salvage therapy) [19;20].

Intended self-medication and storage of antibiotics at home are both considered to be predictors of actual self-medication, as reported by Grigogyan and colleagues [21]. With regard to these predictors, mainly the storage of antibiotics at home, our results are comparable with those reported from Malta and the Czech Republic (28% UAE, 35% Malta, and 7.5% Czech Republic). We found that the main source of obtaining these antibiotics were local community pharmacies. Our study also revealed that retrieving medicines from abroad is another common source, especially those which are expensive (100% of home stored azithromycin in our study was brought in from outside the UAE). Participants also indicated that another reason for both storing antibiotics at home and for bringing them from outside the UAE was the person's eligibility for medical insurance benefits.

One limitation of our study is that the participants were book fair visitors who are generally intellectual and educated. Therefore, the sample might not be representative of all society classes. Since the participants were self-reporting via the questionnaire, we cannot be certain that we received all the relevant information related to their complaints and medicines (in terms of receiving or buying). Such bias may impact upon our results, but is difficult to avoid in questionnaire-based studies. While this study was the only assessment of self-medication in the UAE, future studies would ideally follow participants over time to gain a deeper insight into self-medicating behaviors.

Conclusions

The results of this study confirm that antibiotic self-medication is a relatively frequent problem in the UAE and interventions at different levels are required in order to reduce the frequency of antibiotics misuse. Quick *et al*. [22] classified these interventions into four sections: managerial, regulatory, educational, and financial. For the UAE, managerial interventions could include updating the Antibiotics Policy and Guide to Antimicrobial Therapy (2nd Edition 1998), establishing a National Antibiotic Therapeutic Advisory Committee, and establishing a set of National Standard Treatment Guidelines. Regulatory strategies should concentrate on limiting the import of drugs to the market [1]. The educational interventions for both prescribers (e.g. flow charts, newsletters, bulletins, etc.) and patients/consumers (e.g. educational campaigns on antibiotics, their uses and limitations) are very important and should be

considered a priority. With regard to the financial interventions, the National Mandatory Health Insurance scheme should play an important role to diminish the problem of self-medication in the UAE.

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Corresponding author

Dr. Abobakr Abasaeed
Ministry of Health, Abu Dhabi, UAE. PO Box 848
Telephone and fax numbers: +971-50-7376987
E-mail: dr_abasaeed@yahoo.co.uk

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