Original Article

www.wjahr.com

ANTIBIOTICS MISUSE AMONG CLIENTS ATTENDING PRIMARY HEALTH CARE CENTERS IN HILLA CITY

¹*Ehab Abdul Amir Al-Khafaji, ²Mohanad Fadhil Alkhafaji and ³Zainab Raad Naji Al-Baghdadi

¹Babylon Health Directorate, Babylon, Iraq.
²Babylon Health Directorate, Babylon, Iraq.
³Baghdad - Al-Karkh Health Directorate, Baghdad, Iraq.

*Corresponding Author: Ehab Abdul Amir Al-Khafaji

Babylon Health Directorate, Babylon, Iraq.

ABSTRACT

Background: Illogical use of antibiotics has become a common phenomenon in developing countries. Objectives: to determine the proportion of antibiotics misuse as well as the association of antibiotic misuse with respondent's socio-demographic characteristics and factors of antibiotics use history. **Methods:** A cross- sectional study (including 324 respondents) was done from some of the primary health care centers at AL-Hilla city from September 2013 to March 2014 who were selected randomly and subjected to structured questionnaire covering socio-demographic characteristics and factors related to history of antibiotics use and then the responses were analyzed statistically. **Results:** The data indicated that 141 (43.5%) respondents utilised antibiotics without physician prescription. A mere 35.8% of respondents were 25-34. Overall, 56.8% of responders were women. Marriage was 76% and 5/10ths. Most responders (72.5%) were unemployed. This survey found 39.5% of respondents were primary schoolers. Most (52.2%) respondents reported modest monthly income. Urban respondents comprised 75.3%. The antibiotics they took previous year were unknown to 62% and 3/10 of respondents. Only 44.3% of antibiotics were penicillin. Antibiotic sources were significantly associated with sex, employment, education, family income, and residence. There were significant connections between antibiotic sources and certain factors: kind of antibiotics taken last year, reason for using antibiotics without prescription, and antibiotic information source. **Conclusion:** Large percentage of responders abuse antibiotics. This study also found significant connections between antibiotic overuse and gender, employment, education, family income, and location. Antibiotics used in the last year were unknown to over half of respondents. Most antibiotics used without a prescription waste time.

KEYWORDS: Antibiotics, Misuse, Prescription, knowledge.

INTRODUCTION

Antibiotics, since their introduction in the 1940s, have revolutionized the treatment of bacterial infections in humans and have been widely applied in veterinary medicine, agriculture, and aquaculture. However, over the past 70 years, the misuse and overuse of antibiotics have contributed to the growing problem of antibiotic resistance. Misuse refers to the improper use of antibiotics for therapeutic purposes, such as taking antibiotics not prescribed for a person or using them for viral infections, which do not respond to antibiotics.[1,2] In developing countries, including Iraq, irrational use of antibiotics is a prevalent issue due to uncontrolled access. Antibiotics are often overprescribed in hospitals, sometimes for 44-97% of patients, even when unnecessary.[3] Iraq has a high rate of antibiotic misuse across various settings, including inpatients, outpatients, and private clinics. Despite the high prevalence, data on the causes of misuse and the specific types of antibiotic resistance are limited. In 2011, the World Health Organization highlighted the global threat of antibiotic resistance with the theme "Combat Antimicrobial Resistance: No Action Today, No Cure Tomorrow".[4] One major reason for antibiotic misuse is the lack of public understanding regarding the proper use of antibiotics. For instance, antibiotics are ineffective against viral infections, such as upper respiratory tract infections, which are self-limiting and do not benefit from antibiotic treatment.[5,6] Misuse of antibiotics for these viral infections is widespread, leading to bacterial resistance, increased healthcare costs, and the risk of adverse side effects, such as gastrointestinal issues.[7,8]

Selective pressure from the inappropriate use of antibacterial agents encourages the emergence of resistant bacterial strains. For example, antibiotics are frequently prescribed for uncomplicated lower respiratory tract infections, which are often viral, despite limited evidence of benefit from their use.[9-11] Although misuse of antibiotics is a global issue, information about antibiotic consumption patterns and behaviors in countries like Saudi Arabia is scarce. There is little data on how parents use antibiotics for their children, especially in the context of treating viral infections.[12,13] This study aims to determine the extent of antibiotic misuse among clients at primary health care centers and to assess the association between misuse and various socio-demographic factors and antibiotic use history in Al-Hilla City, Iraq, from September 2013 to March 2014.

METHOD
Study Design: This study was a cross-sectional survey conducted from September 2013 to March 2014.

Study Population: The study population included 324 respondents aged 15 years and older, selected through random sampling (every 4th person, starting with the 1st) from both rural (Al-Emam Al-Hussein, Al-Emam Ali) and urban (Al-Aqsaa, AL-Zahraa) health centers in Hilla City. Participants were included based on their verbal consent to participate.

Data Collection
Inclusion Criteria
- Respondents aged 15 years and above.
- Individuals who used antibiotics in the previous year.
- Verbal agreement to participate.

Exclusion Criteria
- Respondents under 15 years of age.
- Respondents who took antibiotics without a doctor's prescription (considered misuse).
- Family income below 500,000 ID per month (low-income group), between 500,000 and 750,000 ID per month (moderate-income group), or above 750,000 ID per month (high-income group).

Study Variables
Dependent Variable
- Proportion of antibiotics misuse among respondents.

Independent Variables
- Socio-demographic characteristics of respondents, including age, sex, marital status, occupation, education, income, and residence.
- History of antibiotics use, including questions related to:
  o Knowledge of antibiotics taken in the previous year.
  o Types of antibiotics taken.
  o Frequency of antibiotic use.
  o Duration of antibiotic use.
  o Completion of the antibiotic course.
  o Reasons for not completing the antibiotic course.
  o Reasons for taking antibiotics without a prescription.
  o Medical conditions for which antibiotics were used.
  o Sources of information about antibiotics.

Study Instruments: A structured, self-administered questionnaire (see appendix) was designed by the research team. It collected data on socio-demographic characteristics and factors related to antibiotics use, including the aforementioned questions about antibiotics knowledge, use, and misuse.

Data Analysis: Statistical analysis was performed using SPSS version 18. Categorical variables were summarized as frequencies and percentages. Pearson's chi-square (X^2) test was used to assess associations between categorical variables. A p-value of ≤ 0.05 was considered statistically significant.

RESULTS
Table 1 shows the distribution of respondents by history of antibiotics use. Majority 202 (62.3%) of respondents did not know the antibiotics they took in last year. Meanwhile, only 54 (44.3%) of antibiotics they took was from penicillin group. Majority 227 (70.1%) of respondents took antibiotics less than an equal five times in last year. Also 285 (88.0%) took antibiotics less than and equal 3 days. About 223 (68.8%) of respondents did not complete their course of antibiotics. Meanwhile 130 (40.2%) of all respondents take antibiotics without prescription to save money. Only 117 (36.1%) of respondents took antibiotics for flu. Majority 250 (77.2%) of respondents have their information about antibiotics from doctors.

Table 1: Distribution of respondents by history of AB use.

Variable	Frequency (%) N= 324
Did you know the AB you took in the last year?	
Yes	122 (37.7 %)
No	202 (62.3 %)
What is the AB you took in last year?	
Penicillin group	54 (44.3%)
Cephalosporin group	39 (32%)
Methoprim	12 (9.8%)
Metronidazole	8 (6.6 %)
Ciprofloxacin	4 (3.3%)
Other	5 (4%)

Total	122 (37.7%)
How many times did you take AB in last year?	
<= 5 times	227 (70.1%)
>5 times	97 (29.9%)
For how many days did you take AB	
<= 3 days	285 (88%)
>3 days	39 (22%)
Did you complete the course of AB you took?	
Yes	101 (31.2%)
No	223 (68.8%)
Why did not complete the course of AB you took	
The course did not succeed	16 (7.2%)
Symptoms have been disappeared	207 (92.8%)
Total	223 (68.8%)
If you take AB without prescription, what do you think the cause will be?	
Money saving	130 (40.2%)
Time saving	116 (35.8%)
Previous better prescription	62 (19.1%)
Other	16 (4.9%)
For which medical condition did you take AB	
Flu	117 (36.1%)
Sore throat	98 (30.2%)
Fever	32 (9.9%)
Cough	21 (6.5%)
Diarrhea	17 (5.2%)
Other	39 (12.1%)
What is the source of your information on AB	
Doctors	250 (77.2%)
TV	2 (0.6%)
Friends	11 (3.4 %)
Internet	2 (0.6 %)
Other	59 (18.2%)

Table 2 shows the association of source of antibiotics use with respondents' socio-demographic characteristics. There were significant associations between sources of antibiotics use with sex, occupational status, educational status, family income and residence. Seventy-one (50.4%) who use antibiotics without prescription were males. Ninety-six (68.1%) who use antibiotics without prescription were non - employed Also 72 (51.0%) who use antibiotics without prescription completed their secondary school. About 117 (83.0%) who use antibiotics without prescription had moderate family income. One-hundred twenty-seven (90.1%) who use antibiotics without prescription were belonged to urban area.

Table 2: Association of source of antibiotic use with respondents socio-demographic characteristics.

Variable	Source of AB use		X^2	P values
	By doctors prescriptiom (n%)n=183	Without doctors prescriptiom (n%) n=141		
Age groups				
15-24 years	34 (18.6)	29 (20.6)		
25-34 years	66 (36.1)	50 (35.5)		
35-44 years	34 (18.6)	32 (22.7)	1.828	0.767
45-54 years	24 (13.1)	15 (10.6)		
>= 55 years	25 (13.7)	15 (10.6)		
Sex				
Male	69 (37.7)	71 (50.4)	5.193	**0.023***
Female	114 (62.3)	70 (49.6)		
Marital status				
Married	137 (74.9)	111 (78.7)		
Single	13 (7.1)	16 (11.3)	5.453	0.142
Widow	27 (14.8)	12 (8.5)		
Divorce	6 (3.3)	2 (1.4)		

Occupational status				
Governmental				
Employee	33 (18.0)	19 (13.5)	12.484	**0.002***
Self - Employed	11 (6.0)	26 (18.4)		
Non - Employed	139 (76)	96 (68.1)		
Educational status				
Illterate	20 (10.9)	6 (4.3)		
Primarys school	87 (47.5)	41 (29.1)	33.972	**< 0.001***
Secondary school	38 (20.8)	72 (51.0)		
University and more	38 (20.8)	22 (15.6)		
Family income				
High income	13 (7.1)	3 (2.1)		
Moderate income	52 (28.4)	117 (83.0)	95.094	**<0.001***
Low income	118 (64.5)	21 (14.9)		
Residence				
Urban area	117 (63.9)	127 (90.1)	29.257	**< 0.001***
Rural area	66 (36.1)	14 (9.9)		

* P value <= 0.05 is significant

Table 3 shows the association of source of antibiotics use other factors of antibiotics use history. There were significant associations between sources of antibiotics use with the questions: Did you know the antibiotics you took in last year, why did you take antibiotics without prescription, as well as, what is the source of your information on antibiotics. 72 (51.1) who use antibiotics without prescription did not know antibiotics they took in the last year. 81 (57.4) who use antibiotics without prescription saved money. 75 (53.2) who use antibiotics without prescription their source of information was from doctors.

Table 3: Association of source of antibiotic use with other factors of AB use history.

Variable	AB by doctors prescription (N%) N= 183	AB without doctor's prescription (n%) n=141	X^2	P values
Did you know the AB you took last year?				
Yes			13.535	< 0.001*
No	53 (29.0)	69 (48.9)		
	130 (71.0)	72 (51.1)		
What is the AB you took last year?				
Penicillin group	24 (47.1)	30 (42.3)		
Cephalosporin group	14 (27.5)	25 (35.2)		
Methoprim	6 (11.8)	6 (8.5)	6.362	0.273
Metronidazole	1 (2.0)	7 (9.9)		
Ciprofloxacin	3 (5.9)	1 (1.4)		
Other	3 (5.9)	2 (2.8)		
How many times did you take AB in last year?				
=< 5 times	125 (68.3)	102 (72.3)	0.618	0.432
>5 times	58 (31.7)	39 (27.7)		
For how many days did you take AB				
=< 3 days	159 (86.9)	126 (89.4)	0.461	0.497
>3 days	24 (13.1)	15 (10.6)		
Did you complete the course of AB				
Yes	55 (30.1)	46 (32.6)	0.245	0.621
No	128 (69.9)	95 (67.4)		
Why you did not complete the AB course				
The course did not succeed			0.908	0.341
Symptoms have been gone	11 (8.6)	5 (5.3)		
	117 (91.4)	90 (94.7)		
If you took AB without prescription what do you think the cause will be ?				
Money saving	116 (63.4)	14 (9.9)		
Time saving	35 (19.1)	81 (57.4)	110.220	<0.001*
Previous better prescription	19 (10.4)	43 (30.5)		
Other	13 (7.1)	3 (2.1)		

For which medical condition you took AB				
Flu	71 (38.8)	46 (32.6)		
Sore throat	5 (2.7)	12 (8.5)		
Fever	12 (6.6)	9 (6.4)	6.548	0.256
Cough	53 (29.0)	45 (31.9)		
Diarrhea	18 (9.8)	14 (9.9)		
Other	24 (13.1)	15 (10.6)		
Your information source on AB				
Doctors	175 (95.7)	75 (53.2)		
TV	1 (0.5)	1 (0.7)		
Friends	1 (0.5)	10 (7.1)	82.750	<0.001*
Internet	0 (0.0)	2 (1.4)		
Other	6 (3.3	53 (37.6)		

P value =< 0.05 is significant

DISCUSSION

Antibiotic misuse poses a significant threat to public health by contributing to the rise of antibacterial resistance. In this study, 43.5% of respondents reported using antibiotics without a doctor's prescription. This is consistent with findings from other Middle Eastern countries where antibiotics can be easily obtained without prescriptions. A study from Riyadh, Saudi Arabia, in 2010 revealed that antibiotics were accessible without prescription in 78% of pharmacies.[5] Similarly, in Jordan, 94% of pharmacists dispensed drugs without prescriptions, mostly antibiotics.[14] In Kuwait, a 2010 study found that antibiotics were prescribed to 50% of patients with upper respiratory tract infections, even though only a few required them.[14] A study in Iran also demonstrated high antibiotic misuse, with 99% of patients receiving at least one antibiotic.[15] The misuse of antibiotics is influenced by various factors, including a lack of public awareness and improper prescribing practices by physicians.[16-18] Approximately 80% of antibiotics are used in primary care, with misuse often driven by pressure on physicians to act or patient expectations.[19] Research shows that increased antibiotic consumption is associated with the emergence of drug resistance.[19] This study found no significant association between antibiotic misuse and respondents' age or marital status, aligning with findings from British Columbia and Nigeria.[20] However, females were more likely to use antibiotics as prescribed, while males were more likely to misuse them, as reported in a 2009 study in the United Arab Emirates.[21] Urban residents and those with secondary education were also more likely to misuse antibiotics, likely due to increased confidence in self-medicating, a pattern supported by studies in Vietnam.[22] Moreover, non-employed respondents and those with middle incomes were more likely to misuse antibiotics, contrasting with findings from Baghdad, Iraq, which reported higher misuse among low-income families.[23] The present study also reported that respondents frequently took multiple antibiotics, failed to complete their courses, and lacked knowledge about proper antibiotic use. Penicillin was the most commonly misused antibiotic, mirroring findings from a study in Iran.[24] Additionally, patients were motivated by saving time or prior successful prescriptions, and some exaggerated symptoms to obtain antibiotics.[25] Misuse was exacerbated by patients keeping leftover medications and pharmacists dispensing antibiotics without prescriptions in countries like the UK, France, and Spain, where such practices are illegal.[26]

CONCLUSION

This study reveals a considerable percentage of respondents using antibiotics without a doctor's prescription. Significant associations were found between antibiotic misuse and several factors, including gender, occupational status, educational level, family income, and place of residence. More than half of the respondents who used antibiotics without a prescription were unaware of the specific antibiotics they had taken in the past year. Additionally, respondents were significantly more likely to take antibiotics without a prescription to save time, due to reliance on previous prescriptions, and as a means to save money.

References:
1. Diggins FWE. The true history of the discovery of penicillin, with refutation of the misinformation in the literature. Br J Biomed Sci; 1999; 56: 83-93.
2. FDA. Antibiotic resistance: How misuse of antibiotics could threaten your health. FDA Consumer Health Information, 2009; 16.
3. Abdulah R. Antibiotic abuse in developing countries. Pharmaceut Reg Affairs, 2012; 1: 2.
4. World Health Day 2011 - Antibiotic resistance: No action today, no cure tomorrow. Available from: http://www.who.int/mediacentre/news/statements/2011/whd_20110407/en/index.html.
5. Jetacar. The use of antibiotics in food-producing animals. Commonwealth Department of Health and Aged Care. Australia, 1999.
6. Ling Oh A, Hassall MA, Al-Haddad MS, et al. Public knowledge and attitudes towards antibiotic usage: A cross-sectional study among the general public in the state of Penang, Malaysia. J Infect Dev Ctries, 2011; 5(5): 338-47.
7. Cebotarenco N, Bush P. Reducing antibiotics for colds and flu: A student-taught program. Heal Educ Res; 2008; 23: 146-57.

8. Huang S, Rifas-Shiman S, Kleinman K, et al. Parental knowledge about antibiotic use: Results of a cluster-randomized, multi-community intervention. Pediatrics, 2007; 119: 698-706.

9. Flora K, Scott W, Jason B, et al. Improving antibiotic utilization among hospitalists: A pilot academic detailing project with a public health approach. J Hosp Med; 2008; 3: 64-70.

10. Tenover F. Mechanisms of antimicrobial resistance in bacteria. Am J Med; 2006; 119: 3-10.

11. Little P, Stuart B, Francis N, et al. Effects of internet-based training on antibiotic prescribing rates for acute respiratory-tract infections: A multinational, cluster, randomised, factorial, controlled trial. Available from: www.thelancet.com, 2013; 382: 1175-82.

12. Green R. Symptomatic treatment of upper respiratory tract symptoms in children. South Afr Fam Pract; 2006; 48: 14-9.

13. Mora Y, Avila-Agtiero M, Umafia M, et al. Epidemiologic observations of the judicious use of antibiotics in a pediatric teaching hospital. Int J Infect Dis; 2002; 6: 74-7.

14. Sorkhou I, Al Qallaf B, Hajiah A, et al. Perceptions of patients attending primary care in Kuwait regarding upper respiratory tract infections. Kuwait Med J; 2002; 34: 272-5.

15. Sarahroodi S, Arzi A, Sawalha A, et al. Antibiotics self-medication among southern Iranian university students. Int J Pharmacol, 2010; 6: 48-52.

16. Harbarth S, Albrich W, Brun-Buisson C. Outpatient antibiotic use and prevalence of antibiotic-resistant Pneumococci in France and Germany: A sociocultural perspective. Emerg Infect Dis; 2002; 8: 1460-7.

17. Vazquez-Lago J, Lopez-Vazquez P, López-Durán A, et al. Attitudes of primary care physicians to the prescribing of antibiotics and antimicrobial resistance: A qualitative study from Spain. Fam Pract; 2012; 29: 352-60.

18. Cadieux G, Tamblyn R, Dauphinee D, et al. Predictors of inappropriate antibiotic prescribing among primary care physicians. CMAJ; 2007; 177: 877-83.

19. Patrick DM, Marra F, Hutchinson J, Monnet DL, Ng H, Bowie WR. Per capita antibiotic consumption: How does a North American jurisdiction compare with Europe? Clin Infect Dis; 2004; 38: 11-7.

20. Osemene KP, Lamikanra A. A study of the prevalence of self-medication practice among university students in Southwestern Nigeria. Trop J Pharm Res; 2012; 11(4): 683-9.

21. Abasaeed A, Vlcek J, Abuelkhair M, et al. Self-medication by the community of Abu Dhabi Emirate, United Arab Emirates. J Infect Dev Ctries, 2009; 3(7): 491-7.

22. Hao NQ, Larson M, Kim Chuc NT, et al. Antibiotics and paediatric acute respiratory infections in rural Vietnam: Health-care providers' knowledge, practical competence and reported practice. Trop Med Int Health, 2009; 14(5): 546-55.

23. Behrens RH, Awad AI, Taylor RB. Substandard and counterfeit drugs in developing countries. Trop Doct. 2002; 32: 1-2.

24. Barden L, Dowell S, Schwartz B, et al. Current attitudes regarding use of antimicrobial agents: Results from physicians' and parents' focus group discussions. Clin Pediatr, 1998; 37(11): 665-71.

25. Carey B, Cryan B. Antibiotic misuse in the community: A contributor to resistance? Ir Med J; 2003; 96: 43-4, 46.

26. Pechère JC. Patients' interviews and misuse of antibiotics. Clin Infect Dis; 2001; 33(Suppl 3).