Original Article

Antibiotic Self-Medication and Risk Factors among Medical Students in an Iranian University: a Cross Sectional Study

Masoud Ghanbari Boroujeni[1]*, Ali Ansari[1], Mohammad Ali Tasharrofi[1], Fatemeh Zabihi[1], Alireza Salimi Chilrani[1], Farima Khalili[1], Mohammad Reza Ghanbari Boroujeni[1], Mohammad Javad Nasiri[1]

[1]Department of Microbiology, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran

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Abstract

Background: Self-medication with antibiotic is a widely prevalent practice all over the world especially among medical students. This study was aimed to evaluate the prevalence and the pattern of self-medication among medical students in Tehran, Iran.

Materials and Methods: A cross-sectional questionnaire-based study was conducted among the undergraduate medical students from a referral university in Tehran, Iran. All data obtained were analyzed using the statistical package for social sciences program (SPSS) version 20.

Results: A total of 201 students were enrolled in the current study. According to the analysis, 129 (64.1%) of the study population reported that they have self-medicated with antibiotics at least once in their student life. The principal morbidities for seeking self-medication include cough and common cold (23.4%) followed by fever (14.9%). The most frequent antibiotics used to self-medicate the mentioned morbidities were: amoxicillin (62%), co-amoxiclav (19.4%), penicillin (17%), cefixime (16%), azithromycin (14%) and tetracycline (9%). The majority of the participants stated cost saving, convenience and lack of confidence as their reasons for self-medication. The drug selection was mostly based on opinion of family members (31.8%), their own experience (27.4%) and the least commonly reported was selection based on recommendation by net citizens (0.5%).

Conclusion: Our study indicates that self-medication is widely practiced among students of the college. In this situation, the health care system should create as effective awareness and educate their students regarding advantages and disadvantages of self-medication.

Keywords: Self-medication, Antibiotics, Iran

***Corresponding Author:** Masoud Ghanbari Boroujeni, Department of Microbiology, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran. Email: Masoudghanbari@sbmu.ac.ir ORCID: 0000-0002-6220-2797

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Introduction

Self-medication is defined as the treatment of common health problems with medicines especially designed, labeled and approved for use without medical supervision[1-3]. It is generally practiced with over-the-counter medicines (OTC), including antimicrobial agents[4-6].

According to the World Health Organization (WHO), the misuse and overuse of antimicrobial medicines can accelerate antimicrobial resistance (AMR) worldwide [7]. Some factors including self-medication practice or failure to complete the dosage are contributing to this issue. In Iran, the prevalence of self-medication is

estimated to be three times more than the world's average rate and it is estimated that 83.3% of Iranians use medicine on their will[8].

The study of self-medication with antibiotics among medical students is of great importance as they have better access to drugs information and they are the future generation to prescribe drugs and have healthcare activities, but as other sectors of healthcare community, they are not immune to drug misuse. Although they have enough knowledge about consequence of drug misuse, self-medication has high prevalence among them, thus they can contribute to the complications such as AMR caused by it.

The aim of this study was to survey the knowledge and practice of self-medication with antibiotics among preclinical students of Shahid Beheshti University of Medical Science (SBMU), the second largest medical university in Tehran, the capital of Iran.

Methods

A questionnaire-based study was conducted among undergraduate medical students at SBMU. A total of 201 students of SBMU, faculty of medicine, were chosen randomly and included in the study.

A pretested questionnaire in English language was prepared based on literature[9]. The data were then collected by trained 3rd year medical students interviewing each of 201 participants. Individuals were explained the objectives and procedure of the study at first and then answered the questions.

Questionnaire consisted of three main parts in multiple choice questions. The first part contained questions focused on aspects of self-medication behaviors. The second section consisted of multiple choice and true/false questions related to general knowledge of antibiotics. The third part contained questions regarding demographic information such as age, sex, year of study, monthly allowance, health insurance and their hometown. All data obtained were analyzed using the statistical package for social sciences program (SPSS) version 20.

Results

Of 201 medical students which completed the questionnaire, 85 (42.3%) of whom were female. The mean age of respondents was 20.6±1.64 years, ranged 18-23 years. Detailed demographic data are shown in Table 1.

Based on our analysis, 129 (64.1%) of the study population reported that at least once a time they have self-medication with antibiotics. Among the student, 32 (15.9%) completed the course of antibiotic therapy and most of the others stopped taking drugs after

Table 1: Demographic data of the study population.

Variable	Total student	Self-medicated student	Odd ratio	CI 95%	P value
Gender					
Male	116	80 (69%)	1	-	-
Female	85	49 (57.6%)	1.63	.91-2.92	0.09
Age range					
18-19	60	33 (55%)	1	-	-
20-21	125	84 (67.2%)	.57	.31-1.12	.10
22-23	16	12 (75%)	.40	.11-1.40	.15

symptoms disappeared. When they were asked if they believe themselves to successfully self-treat, 45.08% were not sure, 16.39% said they cannot treat themselves and only

Table 2: Students background knowledge about antibiotics and pattern of self-medication.

Questions	Total	Yes answer (%)
Do you know what antibiotics are?	201	193(96)
Antibiotics are used for viral infections	201	22(10.9)
Antibiotics are used for bacterial infections	201	178(88.6)
Broad spectrum antibiotics are better than narrow spectrum antibiotics	201	31(15.4)
Higher doses result in faster recovery	201	32(15.9)
Intravenous is better than oral medication	201	109(54.2)
Common adverse reactions of antibiotics are:		
Nausea	201	62(30.8)
Vomiting	201	48(23.9)
Diarrhea	201	61(30.3)
Rash	201	51(25.4)
Vaginal thrush	201	11(5.5)
Drug resistance	201	10(5)
For which of the following complaint(s) did you use antibiotics		
Runny nose	201	28(13.9)
Nasal congestion	201	21(10.4)
Cough	201	47(23.4)
Sore throat	201	1(.5)
Fever	201	30(14.9)
Aches and pains	201	11(5.5)
Vomiting	201	5(2.5)
Diarrhea	201	5(2.5)
Skin wounds	201	14(7)
Others	201	7(3.5)
Your selection was based on		
Recommendation by community pharmacists	201	13(6.5)
Opinion of family members	201	64(31.8)
Opinion of friends	201	5(2.5)
My own experience	201	55(27.4)
Recommendation by net citizens	201	1(.5)
Previous doctor’s prescription	201	52(25.9)
The advertisement	201	-
Where did you usually obtain antibiotics from for self-medication?		
Community pharmacies	201	88(43.8)
TCM practitioners	201	4(2)
Leftover from previous prescription	201	55(27.4)
Online shopping/E-pharmacies	201	1(.5)

Others	201	6(3)
When did you normally stop taking antibiotics		
After a few days regardless of the outcome	201	8(4)
After symptoms disappeared	201	66(32.8)
A few days after the recovery	201	26(12.9)
After antibiotics ran out	201	8(4)
At the completion of the course	201	32(15.9)
After consulting a doctor/pharmacist	201	8(4)
Others	201	-
Have you ever had any adverse? reaction when you Took antibiotics for self-medication?	201	23(11.4)
What did you do for the adverse reactions		
Stopped taking antibiotics	201	11(5.5)
Switched to another antibiotic	201	4(2)
Consulted pharmacy staff	201	5(2.5)
Consulted a doctor	201	12(6)
Consulted family members/friends	201	3(1.5)
Nothing	201	5(2.5)
Do you think you can treat common infectious? diseases with antibiotics successfully by yourself		
Yes, I can	129	47(38.52)
Not sure	129	55(45.08)
No, I cannot	129	20(16.39)

Table 3: Types of self-medicated antibiotics.

Type of antibiotic	**N (%)**
Amoxicillin	80 (62.0)
Amoxicillin/clavulanic acid	25 (19.4)
Penicillin G	22 (17.0)
Cefexim	21 (16.0)
Azithromycin	18 (14.0)
Tetracyclin	12 (9.0)

38.52% believed in their self-medication success.

It is asked from the students about 9 complaints for which antibiotics self-medication were practiced. The two most common health complaints were cough (23.4%) and fever (14.9%) respectively, (Table 2).

The majority of the participants stated cost saving, convenience and lack of confidence as their reasons for self-medication. The drug selection was mostly based on opinion of family members (31.8%), their own experience (27.4%) and the least commonly reported was selection based on recommendation by net citizens (0.5%). Among reported sources for obtaining drugs, the leftover drugs from community pharmacies (43.8%) and previous prescriptions (27.4%) were the first choices.

A part of the questionnaire assesses the student's

background knowledge about antibiotics, their primary indications and awareness about their common adverse effects. The other part asked about adverse effects they have experienced. Among the students, 11.4% reported experiencing adverse drug reactions, for which stopped taking antibiotics or consulted a doctor mostly.

Detailed information about the study population knowledge about antibiotics and their pattern of self-medication are shown in Table 2.

Furthermore, the most frequent antibiotics used to self-medicate the mentioned morbidities were: amoxicillin (62%), co-amoxiclav (19.4%), penicillin (17%), cefixime (16%), azithromycin (14%) and tetracycline (9%) (Table 3).

Discussion

In third world countries like Iran, the limited access to the modern health-care infrastructure and appropriate and affordable drugs may urge the community to seek for alternative source of treating its illnesses. One of the potential alternatives is self-medication. Studies on factors associated with antibiotics misuse are important to prevent the occurrence of antibiotic resistance, which is well-known problem in the most countries. One of the major problems with self-medication with antibiotics is the emergence of drug resistance. Antimicrobial resistance is a current problem world-wide; particularly in developing countries [10]. It is widely believed that human malpractice such as inadequate dosing, incomplete course and indiscriminate drug use have contributed to the emergence and spread of antimicrobial resistance [11].

The present study indicates that self-medication with antibiotics is widely practiced (64.1%) by the undergraduate students of the medical college. This rate is similar to the findings of the another study in Iran which reported 53% of antibiotic self-medication [12], and other studies in turkey (45.8%) [13], Jordan (40.7%)[14], Sudan (48%) [15], Lithuania (39.9%) [16] and also USA (43%) [17].

In study conducted among first year medical students in Bahrain [18], about 44.8% of students practice self-medication while in Karachi the percentage was 76% [19]. A study conducted among medical students in India revealed 53% student practicing self-medication [20].

These differences may be due to the differences in culture or some differences in laws of pharmacies. Likewise, it could be due to the differences in knowledge of people in different countries. Medical knowledge had a significant role in the completing the course of therapy.

Many researchers have been agreed that more information should be given to the public regarding the antibiotics and about the potential adverse effect that could result if antibiotics were used without prescriptions [21];[22];[23]. Such information is expected to help diminish the rate of non-prescribed antibiotic use and should encourage the proper use of this category of drugs, however knowledge doesn't always correlate with behavior [24].

Respiratory tract infections were the most common health condition treated by antibiotics self-medication among our participants. The similar finding was observed in other studies conducted in Iran [12,25], Jordan [26], Palestine [27], turkey [24] and some European countries [28]. Although that the above conditions are known to be mostly due to viral infection, and requiring no antibiotic treatment [29].

The commonest illnesses that led to self-medication with antibiotics in the current study were headache, fever, cough and diarrhea, which were also reported in studies from France and Brazil[30]. Cough and common cold was the most common illnesses followed by diarrhea, fever and headache in study conducted in West Bengal, India [3].

The main antibiotics which reported by students with antibiotics self-medication in our study were: amoxicillin (62%), co-amoxiclav (19.4%), penicillin (17%), cefixime (16%), azithromycin (14%) and tetracycline (9%). The relatively high intake of such antibiotics may be due to the law cost of these antibiotics [14] or it could be due to the its wide prescriptions by physicians which have led most people to recognize these drugs [25].

Self-medication is often the first response to illness among people with low income. In our study it was founded that the practice of self-medication was more prevalent among males than females ($p<0.01$). However, we fail to demonstrate any statistically significant difference between male and female (Table 1).

It is generally expected that self-medication with antibiotics would be more prevalent in senior medical students as they are exposed to the knowledge about drugs and disease [3]. In study conducted in India [3] final-year students practiced self-medication more frequent than first-year student and it was in congruence with the study conducted in Slovenia [31]. Similar results were also reported in the study conducted by James et al in Bahrain [32]. A notable finding in our study is that the final year students practiced self-medication more frequently than the first-year students. This suggests that higher level of medical education is associated with increased practice of self-medication. However, in the study conducted in Nagpur by Sontakke et al [32], the prevalence of self-medication among junior and senior medical students did not differ significantly.

Conclusion

The prevalence of self-medication with antibiotics was relatively high among medical students in our study. Thus, the Ministry of health and its related organizations should consider policies for more effective education of health care providers with revising OTC drugs considering cost-effectiveness of medication. Further studies on other community population are recommended.

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