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Antibiotics Self-Medication among Southern Iranian University Students

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Abstract: The aim of this study is to evaluate the knowledge and behavior toward antibiotic self-medication among medical and non-medical university students in Iran. A cross-sectional study was conducted on a sample of 200 students randomly chosen from a medical and a non-medical university in Ahwaz, South of Iran in 2008. Data was collected using self administered questionnaires with open-ended and close-ended items. Data were entered and analyzed using SPSS 14 and the results were presented as the percentage 97.5% of respondents filled and returned the questionnaire. Self-medication with antibiotics was reported by 42.2% of the medical and 48% of the non-medical students during the last 3 months. Respiratory problems such as sore throat and common cold was the main indication for self-medication with antibiotics (73.3%) and amoxicillin was the most commonly used antibiotic in both groups. The choice of self-medication was based on medical knowledge among medical students (50%) and on a previous suggestion by a physician (32.6%) for the non-medical ones. The prevalence of self-medication with antibiotics among medical and non-medical students was high. Educational programs are needed to teach university students about the potential problems of self-medication with antibiotics.

Key words: Antibiotics, self-medication, students

INTRODUCTION

Self-medication is a common problem worldwide (Sawalha, 2008). Antibiotic resistance is a rapidly increasing worldwide problem (Sawalha, 2008; Levy, 2005). It is now evident that both developing countries such as Iran, Sudan, Jordan, Trinidad and Tobago, Pakistan and Brazil (Sarahroodi and Arzi, 2009; Awad *et al.*, 2005; Al-Azzam *et al.*, 2007; Sawair *et al.*, 2009; Parimi *et al.*, 2004; Sturm *et al.*, 1997; Servidoni *et al.*, 2006; Volpato *et al.*, 2005), as well as, developed countries such as Spain, Greece, Russia, Romania and Lithuania, USA, Italy and Malta (Vaananen *et al.*, 2006; Contopoulos-Ioannidis *et al.*, 2001; Mitsi *et al.*, 2005; Stratchounski *et al.*, 2003; Grigoryan *et al.*, 2006; Richman *et al.*, 2001; Borg and Scicluna, 2002) are experiencing many aspects of inappropriate use of medications in their health care facilities (Otoom and Sequeira, 2006).

Self-medication with antibiotics has the potential to produce harmful effects on the society, as well as, on individual patients (Awad *et al.*, 2005). It has been shown that self-medication with antibiotics are high among Iranian college students. This may be due to the fact that antibiotics can be obtained from pharmacies without the requirement of a prescription even though antibiotics are prescription-only-medicine. The fact that the violation of this law is subject to financial penalty is not strictly implemented allowed such practices to occur. Additionally, antibiotics can be supplied by friends, relatives and other ways (Sarahroodi and Arzi, 2009; Grigoryan *et al.*, 2007). In developing countries most illnesses are treated by self-medication (Harbarth and Samore, 2005). There are some reports of antibiotic self-medication in Iran and some other countries (Sawalha, 2008; James *et al.*, 2008; Buke *et al.*, 2005). Thus the aim of this study is to evaluate the current knowledge and behavior regarding antibiotic use among medica and

non-medical students and to determine the extent of self-medication with antibiotics in these population groups.

MATERIALS AND METHODS

The target population was students attending medical sciences (Ahwaz Jondishapour University of Medical Sciences) and non-medical sciences (Shahid Chamran University) universities in the city of Ahwaz in 2008 (Fall and Winter). These two universities are the largest universities in South of Iran. The students were chosen randomly. A total of 195 students (49.7% male and 50.3% female) participated in the study.

The questionnaire was composed by a pharmacist and a pharmacologist. It consisted of both closed- and open-ended questions.

A total of 21 questions were stated concerning the following: socio-demographic characteristics, patterns of self-medication with antibiotics (e.g., type of antibiotics used, source of information regarding the antibiotics and the health condition that pushed the student to use antibiotic without prescription (Sarahroodi and Arzi, 2009).

The survey was conducted by trained 2nd year graduate toxicology student. The respondents completed a self-administered questionnaire and the researcher was present in case the respondents might need assistance. After completion of data collection, it was reviewed, organized, tabulated and entered into Statistical Package for Social Sciences (SPSS Inc., Chicago, IL) for windows version 14. A p-value of <0.05 was considered statistically significant.

RESULTS

A total of 195 university students participated in the study. Among participants, 50.3% were females (n = 98) and 49.7% were males (n = 97). About half (49.7%) of them were enrolled in medical colleges and 50.3% in non-medical ones. Respondents were divided into two groups based on their major: medical group for students in medical colleges and non-medical group for students in non-medical colleges. The mean age of respondents was 21.8±0.25 years. Most of the students (73.2%) were living in dormitories and students' homes, while 26.8% of participants were living with their families. More demographic data are shown in Table 1.

Both categories of students have used antibiotics via self-medication in the past 3 months; with 42.2% of medical students and 48% of non-medical students of study population had used antibiotics without a

prescription or medical advice. There was no significant difference between male and female students in self-medication with antibiotics.

Antibiotic use frequency was once in 16.5% of the participants, twice in 20.4% and 3 or more in 39.8% of the participants in the study period. Only 43.6% of medical and 22.7% of non-medical students completed the course of antibiotic therapy. It is noteworthy that the difference between the two groups was statistically significant with p = 0.001 (Table 1).

Respiratory infection was about 49.2% of all respondents and was the most common health condition that led respondents to practice self-medication among both medical and non-medical groups (Table 2).

As shown in Table 2, medical knowledge seems to have a significant positive impact on self-medication with antibiotics and so 43.6% of antibiotic users without prescription completed their course of therapy.

The antibiotics that were most frequently used for self-medication were also investigated. Penicillins were ranked first (81% for medical respondents and 91.5% for non-medical respondents). Among Penicillins, Amoxicillin was the most frequently used in self-medication (40.5% for medicals and 74.3% for non-medical students) (Table 3).

Table 1: Demographic and behavioral characteristics of the respondents

Variable	Medical students % (n)	Non-Medical students % (n)
Gender		
Male	49.5(48)	50.5(49)
Female	50.0(49)	50.0(49)
Living place		
Dormitory	76.3(74)	51.5(51)
Student housing	10.3(10)	8.2(8)
With family	13.4(13)	39.8(39)
Used self-med with AB	42.2(41)	48.0(47)
How many times		
Once	9.8(9)	6.3(6)
Twice	10.9(10)	11.6(11)
More than 3 times	15.2(14)	28.4(28)
Completed the course	43.6(42)	22.7(22)

Table 2: Medical conditions that pushed the respondents to self-medicate with antibiotics

Condition	Medical % (n)	Non-medical % (n)
Respiratory problems	80.5(29)	66.7(26)
GI problems	13.9(5)	23.0(9)
Systemic problems	0.0	7.7(3)
Skin problems	2.8(1)	2.6(1)
Urine infection	2.8(1)	0.0

Table 3: The type of antibiotic used by respondents in self-medication

Antibiotic name	Medical % (n)	Non medical % (n)
Penicillines	81.0(31)	91.5(34)
Amoxicillin	40.5(15)	74.3(27)
Ampicillin	8.1(3)	8.6(2)
Penicillin	29.7(11)	14.3(5)
Co-amoxiclave	2.7(2)	0.0
Tetracyclines	5.4(2)	2.8(1)
Cephalosporines	8.1(3)	0.0
Sulfanamides	5.4(1)	0.0

Table 4: Basis of using self-medication with antibiotics

Reason	Medical (%)	Non-medical (%)
My non-medical knowledge	28.6(11)	30.4(14)
My medical knowledge	50.0(21)	10.9(5)
Non-physician advice	2.4(1)	21.7(10)
Doctors' advice on last visit	16.7(7)	32.6(15)
Doctors' prescription to others	2.4(1)	4.4(2)

Respondents relied on many sources of information for self-medication with antibiotics, the most commonly used one was their academic medical knowledge (50%) among the medical group and previous experience with prescribed medication (32.6%) in the non-medical group. Advice from relatives or friends and previously prescribed medication for other patients were the other sources of information in self-medication with antibiotics (Table 4).

DISCUSSION

This study evaluated differences of antibiotic self-medication among the medical and non-medical university students in Iran. Studies on factors associated with antibiotic misuse are important to prevent the occurrence of antibiotic resistance (Sawair *et al.*, 2009), which is a well-known problem in the most countries (Sarahroodi and Arzi, 2009; Awad *et al.*, 2005; Al-Azam *et al.*, 2007; Sawair *et al.*, 2009; Parimi *et al.*, 2009; Sturm *et al.*, 1997; Servidoni *et al.*, 2006; Volpato *et al.*, 2005; Vaananen *et al.*, 2006; Contopoulos-Ioannidis *et al.*, 2001; Mitsi *et al.*, 2005; Stratchounski *et al.*, 2003; Grigoryan *et al.*, 2006; Richman *et al.*, 2001; Borg and Scicluna, 2002). All population of this study were Iranian, most of them living in university dormitories and far from their families.

More than 40% of all the respondents practiced self-medication with antibiotic within 3 months before the study. This rate is similar to the findings of our other study in Iran by 53% of antibiotic self-medication (Sarahroodi and Arzi, 2009) and other studies in Turkey (45.8%) (Buke *et al.*, 2003), Jordan (40.7%) (Al-Azzam *et al.*, 2007) Sudan (48%) (Awad *et al.*, 2005), Lithuania (39.9%) (Berzanskyte *et al.*, 2006) and also USA (43%) (Richman *et al.*, 2001).

Higher rates of self-medication are reported in China (Bi *et al.*, 2000) and Greece (Mitsi *et al.*, 2005). Although there are some lower rates, reported from Palestinian students (Sarahroodi and Arzi, 2009), Mexico (Calva and Bojalil, 1996) Sweden (Svensson *et al.*, 2004), Malta (Borg and Scicluna, 2002), India (Saradanma *et al.*, 2000) and Finland (Vaananen *et al.*, 2006) these differences could be because of differences in culture or some differences in law pharmacies. Also it could be because of differences in knowledge of people in different countries.

In this study, 32.5% of all the respondents completed the course of antibiotic therapy. This is similar to the result of study by Sawair *et al.* (2009) in Jordan which found that self-medication with antibiotics was practiced by 37.6% of Jordanians (Sawair *et al.*, 2009) and is higher than our other study in a university in Tehran (26.8%) (Sarahroodi and Arzi, 2009).

Medical knowledge had a significant role on completing the course of therapy.

It is agreed by many researchers that it is necessary to give more information to the public regarding antibiotics and about the potential adverse effects that could result if antibiotics are used without a prescriptions (Haltiwanger *et al.*, 2001; Carey and Cryan, 2003; Liu *et al.*, 2001). 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 (Buke *et al.*, 2005).

Respiratory tract infections (sore throat, cold and others) are the most common health condition treated by antibiotic self-medication in both groups. The same condition is the reason of self-medication in our other study in Iran (Sarahroodi and Arzi, 2009), Jordan (Sawair *et al.*, 2009), Palestine (Sawalha, 2008), Turkey (Buke *et al.*, 2005) and European countries (Grigoryan *et al.*, 2006). Although that the above conditions are known to be mostly due to viral infection (Linder and Stafford, 2001), requiring no antibiotic treatment.

The main antibiotics used in self-medication were penicillins in general, particularly Amoxicillin by medical and non-medical students. Similar results are reported by other studies in Iran and (Sarahroodi and Arzi, 2009) worldwide (Al-Azzam *et al.*, 2007; Sturm *et al.*, 1997; Al-Bakri *et al.*, 2005). This may be due to the low costs of this antibiotic in many places in the world (Al-Azzam *et al.*, 2007) or it could be because of its wide prescription by physicians which have led most people to recognize these drugs by their prescriptions (Sarahroodi and Arzi, 2009). Medical students used more antibiotic types (n = 8) than non-medical students (n = 4). It may be because of their knowledge and attitude about antibiotics.

CONCLUSION

The finding that is most alarming is the high level of inappropriate use of antibiotics. We suggest specific education about antibiotics in non-medical colleges and also to improve education about antibiotics in medical colleges in universities. Physicians should be awarded to

instruct their patient not to use the prescribed antibiotics for upcoming conditions and to complete the course of therapy and not to use medication of their past illness for their new problem without physician or pharmacist suggestion. Antibiotic self-medication may be consequence of poor control over pharmacies, so there is a need to enforce the law on pharmacies, too (Sarahroodi and Arzi, 2009).

Also we suggest more studies about the reasons of this problem in Middle East.

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