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KNOWLEDGE, ATTITUDE AND PRACTICE OF USING ANTIBIOTICS AMONG THE POPULATION OF SEMEY CITY OF EAST KAZAKHSTAN REGION

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Abstract

Background: The growing resistance of microorganisms to antibacterial drugs is a global public health problem, and ignoring the problem of antibiotic resistance can lead to not only medical, but also serious environmental consequences. One of the most important causes of antibiotic resistance is a significant increase in the frequency of antibiotic use. Antibiotics are the only group of drugs that are used unreasonably in 50% of cases.

Aim: to assess knowledge concerning the use of antibiotics among residents of Semey city, East Kazakhstan.

Methodology: We conducted a cross-sectional study among the population of Semey city between October and December 2021. The study involved residents of the city without medical education. Knowledge concerning the use of antibiotics was assessed using questions adapted from a validated WHO questionnaire used in a multi-country survey.

The age profile of participants was summarized by calculating the median age and the interquartile range in years. Categorical variables including the general characteristics of participants (sex, marital status, education level, employment), knowledge about the use of antibiotics and responses on questions about the use of antibiotics in different conditions, were summarized using frequencies and percentages. $P < 0.05$ were considered statistically significant.

Results: A total of 159 adults with a median age of 37 (IQR 35–44) years, were enrolled in the study. 31 percent of residents purchased antibiotics without a doctor's prescription. 25.1% responded that they should stop antibiotics when they feel better. Cold and flu was identified by 65.4% of respondents as condition that can be treated with antibiotics.

Conclusion: There is inadequate knowledge concerning the indications for antibiotics and their appropriate usage. Public health workers are needed to educate the population about appropriate antibiotic use and reduce their irrational use.

Keywords: antibiotics, antibiotic resistance, knowledge about antibiotics.

Резюме

ЗНАНИЯ, ОТНОШЕНИЕ И ПРАКТИКА ПРИМЕНЕНИЯ АНТИБИОТИКОВ СРЕДИ НАСЕЛЕНИЯ ГОРОДА СЕМЕЙ ВОСТОЧНО-КАЗАХСТАНСКОЙ ОБЛАСТИ

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Введение. Растущая устойчивость микроорганизмов к антибактериальным препаратам является глобальной проблемой общественного здравоохранения, и игнорирование проблемы устойчивости к антибиотикам может привести не только к медицинским, но и к серьезным экологическим последствиям. Одной из наиболее важных

причин устойчивости к антибиотикам является значительное увеличение частоты применения антибиотиков. Антибиотики - единственная группа препаратов, которые используются необоснованно в 50% случаев.

Цель: оценить знания об использовании антибиотиков среди жителей города Семей Восточного Казахстана.

Материалы и методы исследования: было проведено поперечное исследование среди населения города Семей в период с октября по декабрь 2021 года. В исследовании приняли участие жители города без медицинского образования. Знания об использовании антибиотиков оценивались с использованием вопросов, адаптированных из утвержденного вопросника ВОЗ, использованного в многострановом обследовании.

Возрастной профиль участников был обобщен путем вычисления среднего возраста и межквартильного диапазона в годах. Категориальные переменные, включая общие характеристики участников (пол, семейное положение, уровень образования, занятость), знания об использовании антибиотиков и ответы на вопросы об использовании антибиотиков при различных состояниях и заболеваниях, были суммированы с использованием частот и процентов. $p < 0,05$ считались статистически значимыми.

Результаты: В исследовании приняли участие в общей сложности 159 взрослых, средний возраст 37 (IQR 35-44) лет. 31% жителей купали антибиотики без рецепта врача. 25,1% ответили, что им следует прекратить прием антибиотиков, когда они почувствуют себя лучше. Простуда и грипп были определены 65,4% респондентов как состояния, которые можно лечить антибиотиками.

Вывод: Было выявлено недостаточное знание о показаниях к применению антибиотиков и их надлежащем применении. Специалистам общественного здравоохранения необходимо проводить мероприятия по информированию населения о надлежащем применении антибиотиков и сокращения их нерационального использования.

Ключевые слова: антибиотики, устойчивость к антибиотикам, знания об антибиотиках.

Түйіндеме

ШЫҒЫС ҚАЗАҚСТАН ОБЛЫСЫ СЕМЕЙ ҚАЛАСЫ ТҰРҒЫНДАРЫ АРАСЫНДА АНТИБИОТИКТЕРДІ ҚОЛДАНУ ТУРАЛЫ БІЛІМІ, ҚАРЫМ-ҚАТЫНАСЫ ЖӘНЕ ПРАКТИКАСЫ

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Кіріспе. Микроорганизмдердің бактерияға қарсы препараттарға төзімділігінің артуы денсаулық сақтаудың жаһандық проблемасы болып табылады және антибиотикке төзімділік мәселесін елемей тек медициналық ғана емес, сонымен қатар ауыр экологиялық салдарға әкелуі мүмкін. Антибиотикке төзімділіктің маңызды себептерінің бірі антибиотиктерді қолдану жиілігінің едәуір артуы болып табылады. Антибиотиктер-бұл 50% жағдайда негізсіз қолданылатын дәрілердің жалғыз тобы.

Мақсат: Шығыс Қазақстан облысы Семей қаласы тұрғындарының антибиотиктерді қолдану бойынша біліміне баға беру.

Материалдар мен әдістер: 2021 жылдың қазан-желтоқсан айларында Семей қаласының тұрғындары арасында көлденең зерттеу жүргізілді. Зерттеуге медициналық білімі жоқ қала тұрғындары қатысты. Антибиотиктерді қолдану туралы білім көпелдік зерттеуде қолданылатын ДДҰ-ның бекітілген сауалнамасынан бейімделген мәселелерді қолдана отырып бағаланды. Қатысушылардың жас профилі жылдардың орта жасы мен кварталдық диапазонын есептеу арқылы жалпыланды. Қатысушылардың жалпы сипаттамаларын (жынысы, отбасы жағдайы, білім деңгейі, жұмыспен қамту), антибиотиктерді қолдану туралы білім және әртүрлі жағдайларда антибиотиктерді қолдану туралы сұрақтарға жауаптар, оның ішінде категориялық айнымалылар жиіліктер мен пайыздарды қолдана отырып жинақталды. $p < 0,05$ статистикалық маңызды болып саналды.

Нәтижелері: зерттеуге орташа жасы 37 (IQR 35-44) болатын 159 ересек адам қатысты. Тұрғындардың 31 пайызы антибиотиктерді дәрігердің рецептісіз сатып алдық деп жауап берді. 25,1%-ы өздерін жақсы сезінген кезде антибиотиктерді қабылдауды тоқтату керек деп жауап берді. Респонденттердің 65,4% суықтыю мен тұмауды антибиотиктер мен емдеуге болатын жағдайлар ретінде анықтады.

Қорытынды: антибиотиктерді қолдану көрсеткіштері және оларды дұрыс қолдану туралы білім жеткіліксіз. Қоғамдық денсаулық сақтау қызметкерлері халықты антибиотиктерді дұрыс қолдану және олардың тиімсіз пайдаланылуына зайту туралы хабарда рету үшін қажет.

Түйінді сөздер: антибиотиктер, антибиотикке төзімділік, антибиотиктер туралы білім.

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Introduction

Antibiotic resistance is a global public health problem that threatens the treatment and prevention of bacterial infections and undermines advanced medical procedures such as cancer chemotherapy, organ transplantation and surgical operations [19],[17]. Antibiotic resistance can occur anywhere, especially where the prevalence of infection of bacterial origin is high [18]. Improper and excessive use of antibiotics accelerates the emergence and spread of antibiotic resistance [12],[9]. Self-medication with antibiotics and over-the-counter delivery of antibiotics are widespread in low- and middle-income countries [10]. Inadequate prescribing of antibiotics and suboptimal adherence to antibacterial therapy are a frequent phenomenon not only in low-income countries, but also in high-income countries [3],[7],[16]. This practice may be due to insufficient public awareness of the emergence of antibiotic resistance and improper implementation of the rules for prescribing and dispensing antibiotics [20]. The World Health Organization (WHO), concerned about this growing threat, has developed a global action plan to combat antibiotic resistance and urges all countries to increase public knowledge about antibiotics and antibiotic resistance through effective information and communication [6]. To develop effective educational activities, it is important to know the level of awareness, attitudes and perceptions of the population about antibiotics and antibiotic resistance [8].

Aim: this paper has attempted to assess knowledge concerning the use of antibiotics among residents of Semey city, East Kazakhstan.

Materials and Methods*Study design and area*

A cross-sectional study was conducted among the population of Semey city without medical education from October to December 2021. Semey is a city of regional significance in Kazakhstan, in the East Kazakhstan region, located on both banks of the Irtysh River. This is the largest city in Kazakhstan, which is not the center of the region or a city of republican significance. A total of 159 respondents were included in the study after sample size estimation.

Data collection tool and procedure

In addition to general and demographic characteristics like age, sex, residence, and marital status, other variables were captured such as employment, and education level. Knowledge concerning the use of antibiotics was assessed using questions adapted from a validated WHO questionnaire used in a multi-country survey[5].The

questionnaire consisted of four sections. The first section included the sociodemographic information of respondents. The second section included questions about use of antibiotics. The third section was knowledge about antibiotics; and the fourth section included knowledge about antibiotic resistance.

The tool used that was developed in Kazakh and Russian. The time used to fill in the questionnaire ranged from 10 to 15 min. The objectives of the study were explained clearly to the participants before data collection. The privacy of respondents was assured by not asking their identity information such as their name, employee identity numbers in the questionnaire. We used all data for the purpose of the research, and they were encrypted and stored electronically in a secure location, with a password used by the principal investigator to ensure privacy and confidentiality. Informed consent was obtained from each participant, and then a structured questionnaire was distributed to collect all the data.

Ethical considerations

Ethical clearance for this study was granted by the Semey medical university ethics committee. Permission to conduct the study were obtained from the participants prior to interview.

Data analysis:

Data were entered in a database and cleaned before checked for completeness. Data were then analyzed using the Statistical Package for Social Sciences (SPSS) version 20. The age profile of participants was summarized by calculating the median age and the interquartile range in years. Categorical variables including the general characteristics of participants (sex, marital status, education level, employment), knowledge about the use of antibiotics and responses on questions about the use of antibiotics in different conditions, were summarized using frequencies and percentages. $P < 0.05$ were considered statistically significant.

Results

Out of 159 respondents who participated in the study, 50 (31.4%) were males and 109 (68.6%) females. The mean age of participants was 37 years. Most of the participants, 55 (34.6%), had bachelor's degrees as their highest educational qualification. Average household income was 575.16 dollars USA. 37.1% household composition of respondents was multiple adults aged 16+ and at least 1 child under 16. Information about use and knowledge about antibiotics is depicted in Table 1.

Table 1.

Information about use and knowledge about antibiotics among respondents (n=159).

Use of antibiotics	Frequency (%)
1	2
1. When did you last take antibiotics?	
In the last month	24(15.1)
In the last 6 months	46 (29.0)
In the last year	14 (8.8)
More than a year ago	29 (18.2)
Never	15 (9.4)
Can't remember	31 (19.5)
2. On that occasion, did you get the antibiotics (or a prescription for them) from a doctor or nurse?	
Yes	92 (57.8)
No	50 (31.4)
Can't remember	17 (10.8)
3. On that occasion, did you get advice from a doctor, nurse or pharmacist on how to take them?	
Yes, I received advice on how to take them (e.g. with food, for 7 days)	83 (52.2)
No	48 (30.2)
Can't remember	28 (17.6)
4. On that occasion, where did you get the antibiotics?	
Medical store or pharmacy	138 (86.8)
The internet	2 (1.2)
Friend or family member	1 (0.7)
I had them saved up from a previous time	0 (0)
Somewhere/someone else	18 (11.3)
Knowledge about antibiotics	
5. When do you think you should stop taking antibiotics once you've begun treatment?	
When you feel better	40 (25.2)
When you've taken all of the antibiotics as directed	100 (62.9)
Don't know	19 (11.9)
6. Do you think this statement is 'true' or 'false'? "It's okay to use antibiotics that were given to a friend or family member, as long as they were used to treat the same illness"	
True	26 (16.4)
False	93 (58.4)
Don't know	40 (25.2)
7. Do you think this statement is 'true' or 'false'? "It's okay to buy the same antibiotics, or request these from a doctor, if you're sick and they helped you get better when you had the same symptoms before"	
True	58 (36.5)
False	56 (35.2)
Don't know	45 (28.3)

Respondents were asked which of a list of medical conditions can be treated with antibiotics. The list contained conditions that can be treated with antibiotics (such as bladder/urinary tract infection (UTI), skin/wound infection, and gonorrhoea) as well as those that cannot. Most respondents do not know whether it is possible to use

antibiotics for bladder infection/ UTI and skin/wound infections, gonorrhoea (Table 2).

Large proportions of respondents mistakenly think that conditions which are usually viral, and therefore do not respond to antibiotics, can be treated with these medicines, notably sore throats (38.3%) and colds and flu (65.4%).

Table 2.

Percentage of responses from all respondents to «Do you think these conditions can be treated with antibiotics»?

Condition	Yes, n (%)	No, n (%)	Don't know, n (%)
HIV/AIDS	13 (8.2)	19 (11.9)	127 (79.9)
Gonorrhoea	30 (18.9)	8 (5.0)	121 (76.1)
Bladder infection or urinary tract infection (UTI)	54 (34.0)	6 (3.8)	99 (62.2)
Diarrhoea	34 (21.4)	27 (17.0)	98 (61.6)
Cold and flu	104 (65.4)	7 (4.4)	48 (30.2)
Fever	53 (33.3)	20 (12.6)	86 (54.1)
Malaria	13 (8.2)	12 (7.5)	134 (84.3)
Measles	16 (10.1)	15 (9.4)	128 (80.5)
Skin or wound infection	41 (25.8)	12 (7.5)	106 (66.7)
Sore throat	61 (38.4)	22 (13.8)	76 (47.8)
Body aches	25 (15.7)	29 (18.2)	105 (66.0)
Headaches	35 (22.0)	30 (18.9)	94 (59.1)

Respondents were asked whether they had heard of a series of terms commonly used in relation to the issue of antibiotic resistance. These included:

- antibiotic resistance
- drug resistance
- antibiotic-resistant bacteria
- superbugs
- antimicrobial resistance
- AMR

Overall, the phrase with the highest level of awareness is drug resistance with 44.7% of respondents stating they have heard the term before. This was closely followed by antibiotic resistance (39.6%) and antibiotic-resistant bacteria (36.5%). Superbugs is the least familiar (17%) (Table 3).

Table 3.

Percentage of all respondents who answered “yes” and “no” to “Have you heard of any of the following terms...”

Term	Yes, n (%)	No, n (%)
Antibiotic resistance	63 (39.6)	96 (60.4)
Superbugs	27 (17.0)	132 (83.0)
Antimicrobial resistance	54 (34.0)	105 (66.0)
AMR	28 (17.6)	131 (82.4)
Drug resistance	71 (44.7)	88 (55.3)
Antibiotic-resistant bacteria	58 (36.5)	101 (63.5)

Discussion

This study showed that 29.0% of respondents took antibiotics during the previous 6 months, 15.1% - last month. 57.8% received a prescription for antibiotics from a doctor, 31.4% said that without a prescription and 10.8% do not remember. 25.2% of respondents consider it necessary to stop taking antibiotics when they feel better. 36.5% of residents said that with repeated illness with the same symptoms, they last bought a well-helping antibiotic or asked a doctor. Residents were provided with a list of several diseases, a question was asked to determine which disease can be treated with antibiotics, and I would especially like to note that 65.4% of residents believe that antibiotics should be used for colds and flu. Most residents said they had never heard the terms "antibiotic resistance",

"superbugs", "antimicrobial drug resistance", "Antibiotic resistance", "drug resistance", "drug resistant bacteria".

According to a study conducted in Kosovo among 811 residents, it was revealed that more than half of respondents (58.7%) used antibiotics during the past year, a quarter of respondents used antibiotics without a doctor's prescription. The most common reasons for the use of antibiotics were influenza (23.8%), followed by sore throat (20.2%), cold (13%). 42.5% of respondents believe that antibiotics are effective against viral infections[4],[13],[14].

In the period from January to March 2014, a cross-sectional study was conducted in Kuwait among the population on the issues of awareness and practice of the use of antibiotics. The study revealed that almost three quarters (72.8%) of respondents had been prescribed antibiotics in the last 12 months, and 36% of them had not completed a full course of treatment. More than a quarter (27.5%) were self-medicating, using antibiotics to treat mainly colds, sore throats and coughs. Almost 47% of the participants had a low level of knowledge about the action, application, safety and occurrence of antibiotic resistance[2],[11].

In another study conducted among students and their families of the Qatar University, where the purpose of the study was to assess the prevalence of inappropriate use of antibiotics, to assess knowledge and attitudes to the use of antibiotics, as well as to assess the opinion of respondents about the practice of prescribing antibiotics by medical professionals. 596 respondents took part in the study. The main inadequate antibiotic use practices followed by respondents were the use of antibiotics without a prescription (82%), not completing a course of antibiotics (45%). This study also showed that almost 60% of respondents showed insufficient knowledge and a negative attitude towards the use of antibiotics. Respondents also reported that neither doctors nor pharmacists provide adequate information to patients on the proper use of antibiotics[1],[15].

Conclusion

Thus, analyzing the literature sources, it is possible to judge the improper use of antibiotics by the population, and as a consequence, the increase in antibiotic resistance indicators. It is projected that about 10 million people will die

annually from antibiotic resistance by 2050 if current trends continue; 40% of these deaths will occur in Africa. Currently, more than 700,000 deaths occurring worldwide, including 214,000 deaths from neonatal sepsis, are associated with resistant bacterial pathogens annually.

The authors contribution:

All authors equally took part in the study of the clinical case and writing the article.

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