ORIGINAL ARTICLE

Knowledge about Antibiotic Use amongst the Public: a cross sectional study in Karachi

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Abstract

Background
Antibiotic resistance is a major public health problem globally. Its main contributing factor is inappropriate use of antibiotics. This practice is highly prevalent in developing countries. There is need of effective interventions to curtail the irrational consumption of antibiotics. The present study evaluated knowledge, attitude and practices of people of Karachi towards antibiotic use in order to devise suitable educational campaigns.

Method
A Cross-sectional study was done from January 2015 to August 2015 using self-administered questionnaire regarding antibiotic use. The study was carried out on non- medical professionals. All completely filled questionnaires were entered into SPSS version 20.00 and analyzed. Descriptive statistic on sample characteristics was computed in percentages.

Results
A total of 600 participants completed the questionnaire. Majority of the participants had poor knowledge of antibiotics and self-medicate without physician's consultation. More than half (67%) of the respondents thought that antibiotics could cure all infections. Sixty five percent believed that antibiotics could treat viral infections as well. A significant number of the participants (45.17%) purchased antibiotics without doctor's prescription and many of them kept its stock at home for emergency purposes. Half of the participants 49.17% used antibiotics prescribed to any member of their family. Majority of the respondents were interested in attending educational programs on effective antibiotic use.

Conclusion
The results of the study reveal the lack of awareness regarding appropriate antibiotic consumption. It is necessary to introduce short training programs on rational antibiotic use. Moreover there must be control on the purchase of antibiotics without the prescriptions by physicians.

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Antibiotic, antibiotic resistance, self-medication

Introduction

Emergence of antibiotic resistance is a big challenge for medicine globally.[1] It is estimated to take lives of 10 million people worldwide annually.[2] This is due to the widespread misuse of antibiotics resulting in development of multidrug resistant bacteria.[3] The main underlying reason is inadequate patient knowledge of antibiotics and their unnecessary consumption.[4] Development of bacterial resistance has increased the cost of health care services.[5] It has become the most significant worldwide issue for patient safety and general public health.[6] Improper antibiotic utilization results from an interaction of wrong practices of physicians, inadequate patient knowledge of antibiotic use, their habit of self-medication and their previous experience with an antibiotic.[7] In order to curtail the problem it is necessary to create awareness regarding its disastrous effect. According to a review by Radyowijati and Haak on antibiotic use, common people think that antibiotics are a kind of "extraordinary or powerful medicine" which can prevent and treat any infection.[8] Literature search provides substantial data regarding the correlation of misuse of antibiotics with emergence of bacterial resistance.[3] According to European research studies antibiotic resistance increases with its mass unchecked utilization.[4]

The inappropriate consumption of antibiotics is widely observed in developing countries.[9] In these countries due to development of resistance to antimicrobial drugs, there is increase in mortality and morbidity from common infectious diseases like tuberculosis, typhoid and meningitis.[10] In 2001, a global approach was suggested by WHO to the member countries to control antibiotic resistance by commencement of learning and instructive programs for general public and patients.[11] Survey reports on antibiotic resistance shows an increase resistance among strains of bacteria such as *Staphylococcus aureus*, *Escherichia coli*, *Acinetobacter* and *Haemophilus influenza*.[12]

On World Health Day, in 2011, WHO set a theme "Combat

drug resistance: no action today means no cure tomorrow".[13] Realizing the importance of the issue, this study was designed to evaluate public knowledge, attitude and practice of antibiotic consumption to gather baseline data for future interventions in the form of educational campaigns.

Materials and Methods

A self-administered questionnaire regarding public knowledge and attitude towards antibiotics was conducted in Karachi, Pakistan from January 2015 to August 2015. Sample size estimation was done by Open Epi. Prevalence of knowledge of population about antibiotics was taken as 50%. A provisional sample size of 384 subjects was obtained with a confidence level of 95% an error (type 1) to be 5%. The sample size was increased to compensate non-responses. Therefore a total of 650 questionnaires were distributed. Subject selection was done by convenient sampling technique.

This cross sectional study was carried out on non- medical professionals like engineers, businessman, bankers, I.T professionals and housewives in order to obtain their knowledge about antibiotic use and practices. The questionnaires were distributed to people working in different non-medical private and public institutes & offices of business, IT, engineering, bank as well as housewives.

The information was collected after taking consent from each subject and giving a brief description about the purpose of study. It was clarified that their personal information will be kept confidential. A pretested 25 items questionnaire used in different related research studies was adopted and further modified according to the requirement of the study.The responses were evaluated using "yes" and "no". The questionnaire sought the demographics of the participants, their knowledge related to antibiotic and practice among the sample population in Karachi, Pakistan. A convenient sampling method was used. The inclusion criteria were:

(a) Subjects aged 20 years or above;
(b) Those who are able to read and understand English.
(c) Those that had previous antibiotic use.

Exclusion criteria were:

(a) Subjects holding medical degree or diploma.

All completely filled questionnaires were entered into SPSS version 20.00 and analyzed. Descriptive statistic on sample characteristics was computed in percentages.

Results

Out of 650 questionnaires, 600 were returned back in useable form (response rate of 92.31%). Table 1 entails the demographics of the participants. Most (34.67%) of the participants belonged to the age group 20-30years. Majority of the sample population owned their private business. Descriptive statistic on the questionnaire items is presented as percentages in Table 2. The general public response towards the current knowledge and practice regarding antibiotic use was evaluated through twenty five questions. Most of the respondents (83%) had the knowledge that antibiotics are medicines that can kill bacteria. But 67.33% of the respondents thought that antibiotics could cure all infections and 65% believed that antibiotics could also be used for viral infections.

Table 1: Characteristics of study population

Characteristics of study population	Percentages
Gender	
Male	73%
Female	26.67%
Age (Years)	
20-30	34.67%
30-40	21.17%
40-50	19.67%
50-60	23.50%
60-70	1.00%
Marital status	
Married	67.33%
Unmarried	32.50%
Qualification	
Matric	3.33%
Intermediate	11.50%
Graduation	68.50%
Post graduation	16.67%
Occupation	
House wife	7%
Banking & Finance	11.67%
IT	4.83%
Teacher	6.33%
Private Business	39.17%
Labor	0.50%
Engineer	30.33%

Moreover 48.50% respondents believed that antibiotics are necessary for the treatment of fever and 63% assumed that antibiotics could relieve pain. About 42.5% of the respondents thought that antibiotics could be used for common cold and flu.

Majority (77.67%) were aware that effectiveness of treatment is reduced if a full course of antibiotic is not completed. Around 67% of the respondent realized that frequent use of antibiotic will decrease efficacy of treatment when using the same antibiotic again and again. Forty six were familiar with the term antibiotic resistance.

The cause of antibiotic resistance as perceived by the study

Table 2: Respondents' knowledge of antibiotics

Serial No.	Questionnaire Item	Yes Percentages	No Percentages
1	Do you think antibiotics can cure all infections?	67.33	32.67
2	Do you think antibiotics are medicines that can kill bacteria?	83.17	16.83
3	Do you think antibiotics are necessary for the treatment of fever?	48.50	51.50
4	Do you think antibiotics are indicated to relieve pain?	63.00	37.00
5	Do you think effectiveness of treatment is reduced if a full course of antibiotic is not completed?	77.67	22.17
6	Do you think efficacy of antibiotics is better if it is newer and costly?	52.33	47.67
7	Do you think frequent use of antibiotics will decrease efficacy of treatment when using the same antibiotic again and again?	67.50	32.50
8	Do you understand or familiar with the term "antibiotic resistance"?	46.83	53.17
9	Do you use prescribed antibiotics?	83.33	16.67
10	Do you some time purchase antibiotics directly from pharmacy without prescription in order to avoid physician's fees and spare time?	45.17	54.83
11	Do you use antibiotics prescribed to any of your family member with same symptoms?	49.17	50.67
12	Do you request physician to prescribe antibiotic for your treatment?	49.67	0.33
13	Do you think it is safe to take antibiotics during pregnancy?	28.83	71.17
14	Do you complete full 5 day course of antibiotic treatment?	77.00	23.00
15	Do you discontinue prescribed treatment earlier when the symptoms of sickness subside?	45.50	54.50
16	Do you follow the dosage instructions provided by the physician?	77.17	22.83
17	Do you escape or miss any dose of drug?	41.33	58.67
18	Do you think one or two dose of antibiotics is enough to treat infection?	42.67	57.17
19	Do you use leftover antibiotics?	29.50	70.50
20	When you get cold, you take antibiotics to help get better quickly?	51.83	48.17
21	Do you use antibiotics for viral infections?	65.33	34.67
22	Do you use antibiotics for common cold & flu?	42.50	57.50
23	Do you keep antibiotics stock at home in case of emergency?	42.50	57.50
24	Do you have any of your family members working in health care facility providing valuable information on antibiotic use?	51.30	48.70
25	Do you think you need education on rational antibiotic use?	42.00	58.00

population is depicted in Figure 1. The present study revealed that about 83% of the sample population used medication prescribed by the physician while 45% of the respondent purchased antibiotic directly from pharmacy without prescription in order to avoid physician's fees and spare time. Near about half (49.17%) of the respondents utilized antibiotics prescribed to any of their family member with same symptoms. Around 29.50% of the respondents used leftover antibiotics. Seventy seven percent of the respondents completed full 5 day course of antibiotic treatment while 45.50% discontinued prescribed treatment earlier when the symptoms of sickness subsided. About 77% of general public followed the dosage instructions provided by the physician. Some of the respondents 41.33% agreed that they miss dose of drug and 42.67% agreed that one or two doses of antibiotic were enough to treat infection. More than half of the sample population (51.83 %) agreed that antibiotic help get better quickly in case they were suffering with cold. Near about 51% agreed that they keep antibiotic stock at home in case of emergency. However some of the respondents (49.67%) used to request physicians to prescribe antibiotic for their treatment. Some of the participants (35.33%) believed that the cause of the antibiotic resistance is due to using them when they are not necessary. Most of the respondents 42.0 % agreed to get education on rational antibiotic use.

Discussion

The study comprised mostly of male respondents. The difference was due to the decreased response from females. Results of the study showed that respondents have varied level of knowledge about antibiotics. Majority of the respondents 83% knew that antibiotics are medicines that can kill bacteria but 67% respondents thought that antibiotics can cure all infections and 65% believed that antibiotics can also be used for the treatment of viral infections. These results are consistent with the studies done in Putrajaya, Malaysia[14] and Indonesia.[15]

In this study, more than half of the respondents (63%) thought that antibiotics can relieve pain. It is in accordance with the results of the study done in Jordan by Helalah *et al* where 66.4% of the respondents assumed that purpose of antibiotic

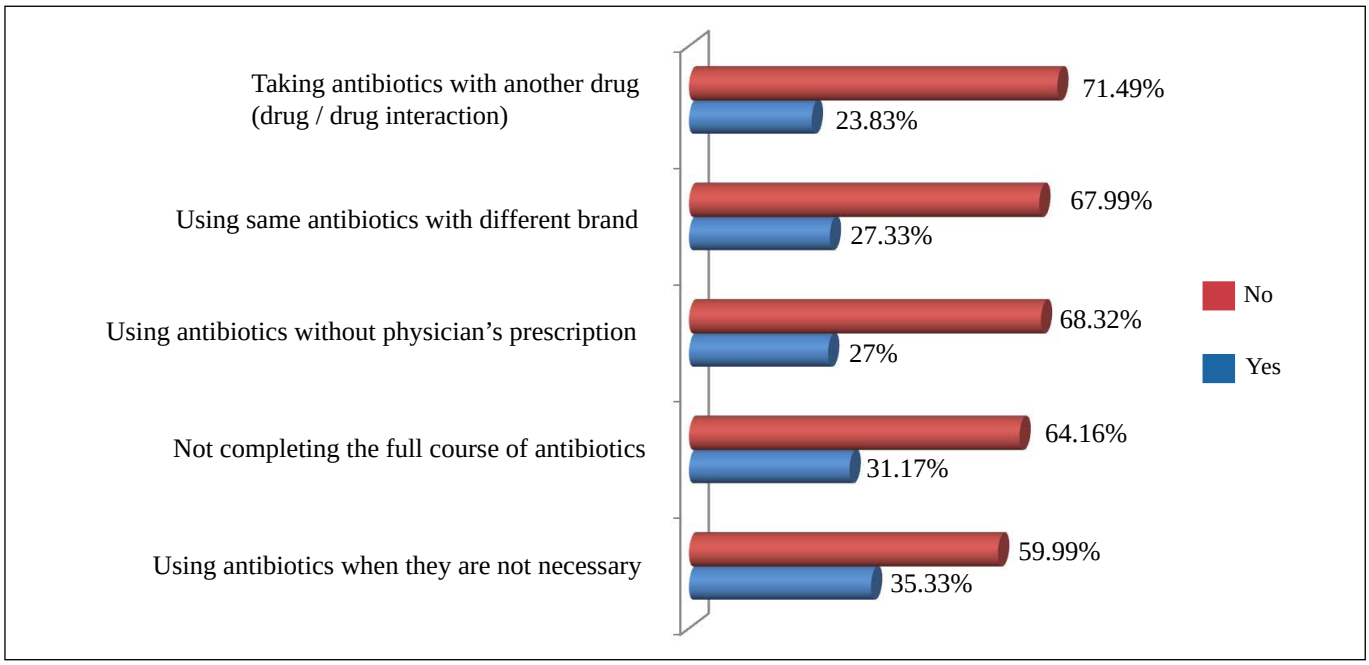

Fig 1. Respondents' perception towards causes of antibiotic resistance.

use is to relieve pain.[16]

Around 48.5% of the respondents of this study considered that antibiotics are necessary for the treatment of fever. This is in agreement with the results of the study by Siddiqui S. *et al* in which 35% of the respondents believed that antibiotics are indicated for any case of fever.[17] Most of these respondents usually thought that antibiotics are like any antipyretic or painkiller drugs. They presumed that stopping antibiotics is not a problem and they can do it as they do with painkillers and antipyretics after cessation of the symptoms.

It was also observed from the results of this study that most of the respondents 52.3% were not familiar with the term of antibiotic resistance which was in concordance with the studies done in Italy[18] and Malaysia[14] in 2013 and 2012 respectively.

About 42.5% of the respondents thought that antibiotics can be used for common cold and flu. These results are consistent with the study done by McNulty et al in 2007[19] and Ling Oh *et al* in 2011[20] showing 38% and 47% of respondents with similar belief respectively.

The respondents also had misunderstandings regarding antibiotic use. Results showed that 45.17% purchased antibiotics directly from pharmacy without prescription in order to avoid physician's fees and spare time. These findings are identical to the one seen in the study done in China in 2014 showing related response.[21] These respondents used antibiotics without prescription because they thought themselves to have more awareness about antibiotic use on basis of their past experience. Moreover around half of the respondents 49.17% in this study used antibiotics prescribed to any of their family member with same symptoms. This is consistent with the study done in Malaysia where respondents shared their antibiotics with family members[14] It was also found that 29.50% of the respondents used leftover antibiotics. However this is in contrast to the study done in India in 2015 where 85.2% respondents did not use leftover antibiotics next time.[22]

Majority of the respondents agreed to follow self-medication which determines that they are unaware of its consequences. This corresponds to a study done by Zafar S.N. *et al* in Karachi in 2008.[23] According to its results the rate of the prevalence of antibiotic self-medication was found to be 76%. Therefore it is important that physicians should inform patients about the adverse effects of self-medication and other related malpractices. Physicians should also appropriately prescribe the exact dosage according to the patient's age and weight requirement and instruct them to complete full antibiotic course. It is also required that patients should discard any leftover drugs so that it cannot be reused by any other family member. These leftover antibiotics are usually available at home because of patient non-compliance of antibiotic course. These factors are linked to non-prescription use of antibiotics by the patient. Poor control on the purchase of drugs from pharmacies is the main reason of self-medication of antibiotics.[24] In Pakistan purchase of antibiotics possible without prescription.[17] It is necessary to make policies at national level to control un-prescribed supply of the antibiotics. When pharmacists have fear of losing their license, they will definitely follow the rules.

According to public surveys done in European countries,

antibiotic self-medication was reported to less than 10%.[25] It suggests the successful outcome of strict policies regarding antibiotic distribution & prescription.

In some circumstances patients expect the physician to prescribe antibiotics as they think taking antibiotics will improve their recovery. In our study 49.67% of respondents used to request physicians to prescribe antibiotic for their treatment. It corresponds to the results reported in surveys done in Pakistan[17], Malaysia[14] and Korea.[26]

In some cases people also stop taking antibiotics as soon as they feel better. Forty five percent of the respondents of this study agreed that they discontinued prescribed treatment earlier when the symptoms of their sickness subsided. Related approach was reported by the respondents of the studies done in Korea in (2011)[26] and in Rawalpindi, Pakistan (2014).[27]

This study has highlighted lack of proper knowledge of antibiotic use and its misuse among people. The results of this study are helpful in planning effective antibiotic awareness programs and guiding patients. Knowledge and attitude have a great impact on a person's actions. Improvement of knowledge and awareness can improve health practices. The earlier we start providing knowledge, the more positive attitude and practice towards appropriate antibiotic use can be seen. This may help in reducing the development of antibiotic resistance against commonly available drugs. Today access to electronic media (television and Internet) is possible for common people. People want to get information on issues regarding health care. It is necessary to promote educational programs that are available on such media to develop awareness regarding the issue of antibiotic resistance. So that people may understand its importance and play an effective role in combating it.

Limitations

As in other self-administered public questionnaire studies, the precision of the results were largely dependent on the respondents. There is chance of selection bias due to convenient sampling. As the study was conducted in only Karachi city, therefore the results can not be generalized to the whole country.

Conclusion

The results of the study have identified significant knowledge and practice gaps. Patient counseling and antibiotic awareness educational campaigns can be helpful to fill these gaps and decrease emergence of antibiotic resistance.

Conflict of Interest

Author declares no conflict of interest.

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