A STUDY ON PATIENTS AWARENESS ON RATIONAL USE OF ANTIBIOTICS AND ITS RESISTANCE

MAHESHWARI P*, PRAVEEN D, RAVICHANDIRAN V

Department of Pharmacy Practice, School of Pharmaceutical Sciences, Vels University, Chennai, Tamil Nadu, India.
Email: mahe.mpharm@gmail.com

ABSTRACT

Objectives: Antibiotics are needed for many serious illnesses such as bacterial pneumonia, bacterial meningitis, septicemia, and even strep throat. These illnesses can be life threatening or can lead to serious complications. The work aims to create an awareness on antibiotics and its resistance in patients. The main objective of this work is to study the patient knowledge through knowledge assessment questionnaire, to promote the rational use of antibiotics and to educate the patients using antibiotics.

Methods: A questionnaire was prepared and data were collected from the patients based on which the study was carried out.

Results and Conclusion: A very high consumption of antibiotics was observed.there was a higher use of cephalosporins. Dispensing of antibiotics is very high in community pharmacy despite of federal regulations, heath education programs should be taken to the patients regarding antibiotics.

Keywords: Rational use, Antibiotics, Resistance.

INTRODUCTION

Antibiotics are drugs that either kill or inhibit the growth of bacteria: Bactericidal and bacteriostatic respectively. A more general term antiinfectives describes drugs that do the same in any type of organism that invades humans such as viruses, protozoans, helminthes, and others [1]. Though a handful of antibiotics that act through diverse mechanisms are known, resistance to antibiotics is a potential problem that needs to be critically ascertained. Since, the major druggable targets of the bacterial genome have been targeted a prompt need for conservation of available antibiotics exists so as to prevent an antibiotics apocalypse [2]. Antibiotic resistance is the ability of bacteria to repel or withstand the effects of an antibiotic. Development of resistance is a microorganism's protective mechanism for surviving in the environment. Though antibiotics do not technically cause resistance, they allow it to happen by creating a situation where a preexisting variant bacterium can flourish and grow. Antibiotic resistance occurs through any of the following mechanisms: Spontaneous deoxyribonucleic acid (DNA) mutation, transformation, and plasmid transfer. Spontaneous DNA mutation: Bacteria are prokaryotes with relatively few genes. Any population of bacteria may have one variant bacterium with unusual traits such as the ability to be resistant to an antibiotic. After treatment with antibiotics, this one bacterium remains, multiplies, and eventually becomes the predominant bacteria [3]. Transformation is a form of microbial reproduction; one bacterium takes up DNA from another bacterium. If the DNA contains a gene for antibiotic resistance, it can be transferred from one bacterium to another by this method. Plasmid transfer is another method of acquiring resistance. Plasmids are small circles of DNA that replicate independently of the chromosome and can jump from one species of bacteria to another. Plasmids theoretically could carry resistance to every antibiotic created. Plasmid transfer is considered the biggest threat in the antibiotic resistance battle. Antibiotic resistance is an increasingly difficult problem in hospitals because they care for critically ill patients who are more susceptible to infections than the general public and therefore they require more antibiotics. Emergence of drug resistant nosocomial superbugs is a potential problem [4]. Nearly two million patients in the United States acquire nosocomial infections hospital each year. Of those patients, about 90,000 die each year because of their infection. The Centers for

Disease Control and Prevention, the Food and Drug Administration, and the National Institute of Allergy and Infectious Diseases all state that antibiotic resistance is one of the world's most pressing health problems. Diseases such as tuberculosis, gonorrhea, bacterial pneumonia, and enterococcal, staphylococcal, and streptococcal infections are now more difficult to treat than they were decades ago [5]. Antibiotic resistance is an increasingly difficult problem in hospitals because they care for critically ill patients who are more susceptible to infections than the general public and therefore they require more antibiotics. The heavy use of antibiotics in these patients causes more gene mutations in bacteria that bring about more drug resistance. The resulting stronger drug resistant bacteria continue to prey on hospital patients [6].

According to statistics from the Centers for Disease Control and Prevention:

Nearly two million patients in the United States get an infection in the hospital each year. Of those patients, about 90,000 die each year because of their infection. This is up from 13,300 patient deaths in 1992. More than 70% of the bacteria that cause hospital-acquired infections are resistant to at least one of the drugs most commonly used to treat them. Some bacteria are resistant to all approved antibiotics and must be treated with experimental and potentially toxic drugs. Persons infected with drug-resistant bacteria are more likely to have longer hospital stays and require treatment with second or third choice drugs that may be less effective, more toxic, and more expensive [7].

In summary, antibiotic resistance is driving up health care costs, increasing the severity of disease, and increasing the death rates from certain diseases. The terms methicillin resistant *Staphylococcus aureus*, vancomycin resistant enterococci, and multi-drug resistant tuberculosis are heard all too often in today's world [8].

This is up from 13,300 patient deaths in 1992. More than 70% of the bacteria that cause hospital-acquired infections are resistant to at least one of the drugs most commonly used to treat them. Some bacteria are resistant to all approved antibiotics and must be treated with experimental and potentially toxic drugs. Hence, irrational and misuse of antibiotics should be prevented by a thorough knowledge

of antibiotics and their indications [9]. Hence, the study was aimed to assess and create patient awareness on antibiotics usage. A knowledge assessment questionnaire (KAQ)-based survey was carried out; assesses patients' knowledge; and educates and promotes the rational use of antibiotics.

METHODS

Method for collection of data: A questionnaire was prepared and data were collected from the patients based on which the study was carried out.

Study site: The study is carried out in Muthu Pharmacy Pvt. Limited, Chennai.

Time of study: The study is carried out for a continuous period of 6 months.

Defining criteria and standards:
1. Inclusion criteria: All the patients who came for the pharmacy to take antibiotics that were either prescribed or over the counter
2. Exclusion criteria: Pediatric and geriatric population.

The following set of questions was in the questionnaire used for survey:
1. Do you know what an antibiotic is?
2. Have you ever taken antibiotics before?
3. Do you complete the course of antibiotic as prescribed by your doctor?
4. When you feel better, do you sometimes stop taking your medications?
5. Do you know the use of drugs you are taking?
6. Do you ever suffer any unwanted effects of your medication?
7. Are you aware that antibiotics are contraindicated in pregnancy?
8. Do you have any allergic reactions while using antibiotics?
9. Are you taking oral or injection antibiotics?
10. Do you feel the medication costs are in your financial status?

Individual patient data collection forms were filled prior to filling of questionnaire forms.

RESULTS AND DISCUSSION

Of 500 patients, only 300 patients wished to answer the KAQ. Based on the inclusion and exclusion criterion 300 patients were chosen for the KAQ study. Of the 300 patients selected, 64% were males and 36% were females. The patients were categorized on the basis of education as shown in Table 1.

The patients were also segregated on the basis of answers given to the KAQ as shown in Table 2.

Of the 300 patients assessed, 61% of them know about antibiotics, 63% have taken antibiotics previously, 57% compile the antibiotic course, 70% stop the medication when felt better, 73% don't know the use of the drug, 59% feel oral route convenient, 62% of the people say the cost of the medicine is high, 61% have side effects using antibiotics.

Categorization on the basis of patient's usage of antibiotics was carried out and the results are as shown in Table 3.

Of the 300 patients taken for the study, 40% of the patients used cephalosporins, fluroquinolones 19%, penicillins 16%, macrolides 14%, tetracyclines 5%, aminoglycosides 4%, and sulfonamides 2%. Patient complaints regarding the use of antibiotics are categorized as shown in Table 4.

CONCLUSION

A very high consumption of antibiotics was observed. Cephalosporins were found to be the most commonly used antibiotics. Despite of federal regulations, dispensing of antibiotics is very high in

Table 1: Educational status of the participants

S. no	Education	Number of patients	Percentage
1	No formal education	37	12
2	Schooling	157	52
3	Higher education	106	35

Table 2: Answers provided by the participants for each question

S. no	Education	Number of patients	
		Yes	No
1.	Question 1	61	39
2.	Question 2	63	37
3.	Question 3	57	43
4.	Question 4	70	30
5.	Question 5	27	73
6.	Question 6	26	74
7.	Question 7	16	84
8.	Question 8	61	39
9.	Question 9	59	41
10.	Question 10	62	38

Table 3: Patterns of use of various classes of antibiotics

S. no	Category	Usage
1	Cephalosporins	121
2	Penicillins	47
3	Fluroquinolones	57
4	Macrolides	43
5	Tetracyclines	15
6	Aminoglycosides	11
7	Sulphonamides	6

Table 4: ADR reported by each participants

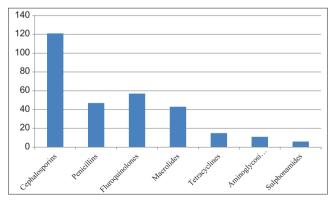| S. no	Complaints	Number of patients
1.	Diarrhea	57
2.	Headache	33
3.	Difficulty in swallowing	27
4.	Vomiting	33
5.	Rashes	14
6.	No Complaints	136

Fig. 1: Patterns of use of various classes of antibiotics

community pharmacies and hence health education programs should be taken to the patients regarding antibiotics. Suitable and sustainable interventions should be implemented to promote the rational use of antibiotics that will help in decreasing the menace of antibiotics resistance [10].

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