



Survey on Antimicrobial Resistance: Reason behind the Misuse of Antibiotics in Bangladesh

**Md. Najem Uddin^{1*}, Md. Hafizur Rahman², Md. Mehedi Hasan¹,
Md. Nazmul Islam¹, Md. Bokhtear Sarkar¹, Md. Rafiul Islam¹,
S. M. Abdul Barik¹ and Md. Nazmul Sardar²**

¹Department of Pharmacy, Varendra University, Bangladesh.

²Department of Pharmacy, Rajshahi University, Bangladesh.

Authors' contributions

This work was carried out in collaboration between all authors. Author MNU designed the study, performed the statistical analysis, wrote the protocol, and wrote the first draft of the manuscript. Authors MHR, MMH, MNI, MBS and MRH managed the analyses of the study. Authors SMAB and MNS managed the literature searches. All authors read and approved the final manuscript.

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ABSTRACT

Aims: It is a base line survey to find the reason behind the misuse of antibiotic in Bangladesh.
Study Design: Questionnaires were supplied to corresponded persons to collect information from patient, doctors & pharmacy shop from seven region of Bangladesh. The data was analyzed by using simple descriptive statistics to generate frequencies, percentage & proportions.
Place and Duration of Study: The survey was carried out throughout Bangladesh from May 2016 to August 2016.
Methodology: Information of 2250 patients, 760 doctors & 1450 chemist shop form 7 regions of Bangladesh were collected from May 2016 to August 2016 using questionnaires consisting descriptive question, true false, multiple choice and a comment part by direct interview method. Wherever it was relevant, the Chi-square test was used to determine any significance difference.
Results: We found majority of people (70%) are not so concern about the antibiotic resistance and it's after effect due to lack of proper knowledge. we found majority of people (70%) are not so

concern about the antibiotic resistance and its after effect due to lack of proper knowledge. 18% people are known with the term antimicrobial resistance but do not have proper knowledge about resistance and the rest of the people (12%) has proper knowledge about antibiotic dosage and antimicrobial resistance. Majority of people are known with the some antibiotics like Azythromycin & Ciprofloxacin which are taken by them without prescription for reducing fever, severe pain and wound without considering the dosage completion.

Conclusion: Antibiotics should only be used when needed as prescribed by health professionals. The prescriber should closely adhere to the five rights of drug administration: the right patient, the right drug, the right dose, the right route, and the right time.

Keywords: Antibiotic; AMR; antimicrobial resistance; Bangladesh.

1. INTRODUCTION

The arsenal of antibiotics may be used up quickly, leaving the patient vulnerable to drug resistant infections. Treatment of bacterial infections in the hospital and community has been altered drastically over the past few decades with the emergence of pathogenic organisms that are no longer susceptible to our most commonly prescribed antibiotics. There is a clear relationship between the amount of a given antibiotic used and the incidence of bacterial resistance [1]. Resistance to commonly used antimicrobial drugs is remarkably high in countries where antibiotics are not restricted [2]. Increasing rates of antimicrobial resistance have left clinicians with limited drug options for the treatment of bacterial infectious diseases. This is a major public health concern worldwide, especially in developing countries where higher rates of resistant bacterial infections persist [3,4]. Antibiotic resistance in developing countries causes a catastrophic increase in the medical and socio economic burden of untreatable infectious diseases [5]. There is already enough evidence of growing resistance to antimicrobials in Bangladesh resulting from misuse of antibiotics [6,7,8].

Antimicrobial resistance (AMR) threatens the effective prevention and treatment of an ever-increasing range of infections caused by bacteria, parasites, viruses and fungi. AMR is an increasingly serious threat to global public health that requires action across all government sectors and society. Without effective antibiotics, the success of major surgery and cancer chemotherapy would be compromised. The cost of health care for patients with resistant infections is higher than care for patients with non-resistant infections due to longer duration of illness, additional tests and use of more expensive drugs. Globally, 480 000 people develop multi-drug resistant TB each year, and

drug resistance is starting to complicate the fight against HIV and malaria, as well [9].

Antimicrobials are the most commonly prescribed group of drugs in general practice and in hospitals. Despite the improved trend of health care in Bangladesh, infectious diseases remain priority public health problem, where widespread use of different antimicrobials against bacterial, fungal, viral and parasitic infections is required. The important factors associated with resistant bacteria are poor hospital hygiene, overcrowding, lack of resources for infection control and lack of personnel trained in controlling infection in hospital. Miscommunication between patient and physician, lack of proper monitoring of DGDA on antibiotic selling are also the alarming reason rising of AMR [10].

2. MATERIALS AND METHODS

Information of 2250 patients, 760 doctors & 1450 chemist shop form 7 regions of Bangladesh were collected from May 2016 to August 2016 using questionnaires consisting descriptive question, true false, multiple choice and a comment part. Beside this we also collected 950 prescriptions to observe the prescribing pattern and frequency of prescribing antibiotics.

The survey was carried out with following the section 12 of WMA declaration of Helsinki. The survey base research is supported by the Students of Department of Pharmacy, Varendra University.

This survey based research is conducted by individuals with the appropriate ethics and scientific education, training and qualifications. The human subjects only participated in the interview; this survey based research didn't require any further approval from institutional ethics committee.

The collected data was analyzed by using simple descriptive statistics to generate frequencies, percentage & proportions. Wherever it was relevant, the Chi-square test was used to determine any significance difference.

3. RESULTS

From our statistical analysis of collected data we found majority of people (70%) are not so concern about the antibiotic resistance and its after effect due to lack of proper knowledge. 18% people are known with the term antimicrobial resistance but do not have proper knowledge about resistance and the rest of the people (12%) has proper knowledge about antibiotic dosage and antimicrobial resistance. Majority of people are known with the some antibiotics like Azythromycin & Ciprofloxacin which are taken by them without prescription for reducing fever, severe pain and wound without considering the dosage completion. They are taking these drugs as OTC drug because there is no proper monitoring for our chemist shop on selling antibiotics without prescription. Even with the prescription, another reason of not continuing dosage of antibiotics is lack of proper guidance from the doctor about antibiotic usages.

Due to large number of patient most of the doctor are unable to expand enough time with a patient so that it is not possible for them to counsel patient about antibiotic resistance but they tell patient to complete antibiotic dose. As the antimicrobial resistance is an on growing problem

they have to prescribe higher dosage of antibiotics than it normally required. We also visited many doctors chamber where we have seen that many of doctors giving only 5-8 minutes per patient on average which is not satisfactory.

We visited and collected data from 1450 pharmacy shop were we found most of them (98%) are selling antibiotics without prescriptions and only 2% are denied to sell. Surveying the prescriptions we found that many patients do not buy full dose of antibiotics as prescribed by physician rather the buy partially and often discontinue taking antibiotics after feeling well. We also observed that many patient comes to pharmacy shop without prescription and buying 1 or 2 days dose of antibiotics even they don't know which is required by them or not. We also listed the most frequently selling antibiotics with or without prescription.

4. DISCUSSION

It is a matter of concern that most of the people are not aware of antimicrobial resistance & it's after effect.

From the data we have collected we found some miscommunication between healthcare professional and patient. Most of patients are not aware about antibiotic resistance and they claimed that they do not get proper information from physician. On the other hand there is not adequate number of doctor available in to serve

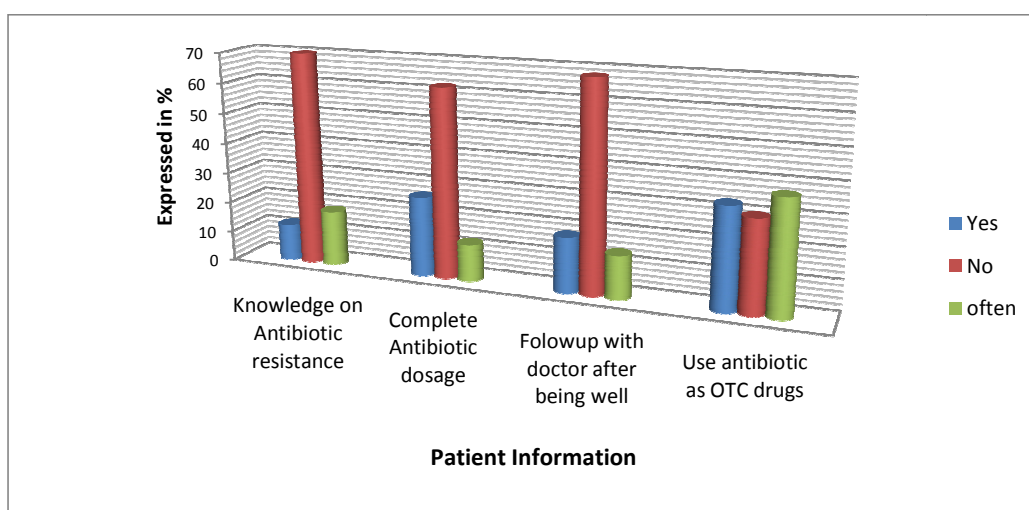


Fig. 1. Patient information

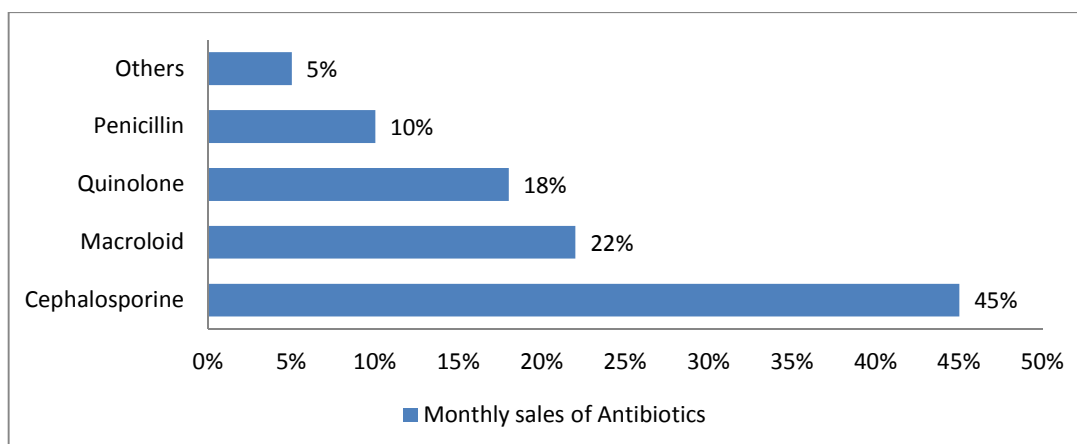


Fig. 2. Monthly sales status of antibiotic

a huge number of patient in our country so that they do not get proper time to counsel patients. Beside these lack of proper monitoring of national regulatory authority antibiotics are sold from pharmacy store frequently wrought prescription even though the shop keeper has no idea about antibiotic dose as well as antimicrobial resistance [11].

Many patients are unwilling to visit doctor after being well due to high visiting fee of doctors. Many of them just do not care about antibiotic resistance and just stopped taking antibiotics just after feeling well because of lack of knowledge. In most cases physician do not aware patient about antibiotic during prescription [12].

On the other hand unethical promotion from some pharmaceutical companies' also insisting pharmacy shop to sell antibiotics & offering various facilities to physicians to prescribe antibiotics, as a result antibiotics are prescribing more frequently even where it is less required.

We found no involvement of A Grade Pharmacist associated with the healthcare system, especially in hospitals & in Pharmacy shops which is also a major reason on this regards. If any doctor make any mistake during prescription then there are no chance of correction because lack of cross check option.

Countries where over-the-counter antibiotics sales are strictly regulated have much lower prevalence rates of self-medication with antibiotics, ranging from 1% to 4% [13]. The widespread availability of antibiotics without a prescription has given rise to concerns about their increased usage [14]. The uncontrolled use

of antibiotics can be harmful because of adverse drug reactions, masking of symptoms of infection, the development of chronic disease and super infection. It is also associated with the emergence and spread of antimicrobial resistance [15]. These problems require appropriate measures by policy-makers to develop pertinent policies as well as to ensure their implementation.

5. CONCLUSION

The results of this study confirm that antibiotic misuse is a relatively frequent problem in the Bangladesh. It is the duty of the government especially Drug Administration of Bangladesh to implement the regulatory controls on the distribution and selling of antibiotics. Uncontrolled distribution and use of antibiotics leads to its resistance. We should aware about the worsening condition of antibiotic resistance. We should aware the people by local media, newspaper, public press about the curse of resistance. Physicians can play an important role in this regards. They should prescribe rationale antibiotic after proper test. We should have avoid the tendency of taking antibiotic as OTC drug.

CONSENT

All participants were freely consent to provide the data. All authors declare that 'written informed consent was obtained from the patient (or other approved parties) for publication of this paper.

ETHICAL APPROVAL

The survey was carried out with following the section 12 of WMA declaration of Helsinki.

This survey based research is conducted by individuals with the appropriate ethics and scientific education, training and qualifications. All patients and doctors were under freely consent during data collection. The human subjects only participated in the interview; this survey based research didn't require any further approval from institutional ethics committee.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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QUESTIONNAIRE

Questionnaire for Patients

Patient's Name: _____ Age: _____
Contact no: _____ Occupation: _____ Education: _____

1. Do you know about the antibiotic dose?

Yes No

2. Have you ever taken antibiotic without physician's recommendation?

Yes No

3. When you take antibiotic do you complete your dose?

Yes No Others (please specify).....

4. Do you stop taking antibiotic after feeling well without completing the dose?

Yes No

5. Most frequently used antibiotics by you?

1. _____ 2. _____ 3. _____

6. Your concept about antibiotics

Most powerful drug which can heal almost all disease. It only works against bacterial infection. Other (Please Specify)
.....
.....

7. By whom you came to know about the use of antibiotic?

Doctor Relatives Others

8. Does the doctor counsel you about doses/resistance during prescribing antibiotics?

Yes No

9. Do you think public health service is satisfactory in our country?

Yes No

10. What is your perception about doctor, why they do not give enough time to patients?

Number of doctor is not sufficient to serve a large number of population in our country. Doctors spend lots of time in private health care service Other (Please Specify)
.....
.....

11. Why do you take antibiotics without physician's recommendation?

.....
.....
.....

12. What is your opinion about antibiotic resistance and what measures can be taken to avoid it?

.....
.....

1. Do you tell your patient about antibiotic doses during prescribing antibiotics?

- Yes No Often

2. Do you tell them about antibiotic resistance?

- Yes No Often

3. We often seen that patient stop taking antibiotic after feeling well without completing required doses of antibiotics, do you counsel them not to do so?

- Yes No Often

4. Do the patient contact with you after recovery or after stop taking medicine?

- Yes No Few

5. How often you get patient with antibiotic resistance to whom antibiotic does not work.

- Regularly Seldom

6. What is your opinion about antibiotic resistance & what measures can be taken?

.....
.....

Questionnaire for Retail Pharmacy Owner

1. Do you sell antibiotics without prescription?

- Yes No Often

2. Do you know about antibiotic doses?

- Yes No

3. Which antibiotics you sell most without prescription?

1. 2. 3.

4. Do the Drug Regulatory Authority monitor the selling of antibiotic?

- Yes No Sometimes

5. Do you tell patients not to buy antibiotics without physician's recommendation?

- Yes No Often

6. Do you have any registered pharmacist in your pharmacy?

i. How many?

- None 1 More

ii. Which Grade?

- A B C

Signature of patients

.....

Pharmacy

Md. Najem Uddin
Lecturer, Dept. of Pharmacy
Varendra University

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