

Misuse and development of resistance towards antibiotics: A survey among 1000 patients in Gopalganj district in Bangladesh

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Received: August 7, 2018; Accepted: August 17, 2018; Published: August 20, 2018

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Abstract

The current study was done to view the level of knowledge about antibiotic misuse and the development of antibiotic resistance among the general people in the District Gopalganj, Bangladesh. For this purpose, questionnaires were prepared and distributed randomly among 1000 abusers within the age range 15 to 80 years. To get appropriate responses, some literate volunteers were assigned who directly collected data. Results suggest that males were more misusers than the females. Second generation antibiotics are the frequently used antibiotics among the patients. More patients were found using antibiotics without clinical diagnosis and in an incomplete dose fashion. More studies are necessary to find out the actual facts on antibiotic misuses and the subsequent gaining of antibiotic resistance.

Key words: Antibiotics; Misuse; Resistance; Health care.

Introduction

Antibiotics of various origins are used in the treatment of bacterial infections (NHS, 2015). However, resistance towards antibiotic drugs is a common occurrence worldwide. Numerous internal and external facts are involved in the development of antibiotic resistance (CDC, 2017). Misuse of antibiotics and growing resistance to these kinds of medications was also seen by Clark et al. (2000). In Jordan, the self antibiotic taking behavior of the patients and growing resistance was reported by Al-Azzam et al. (2007). Similar studies in different regions in the world were also seen by Barah and Gonçalves (2010), Basnyat et al. (2015), and Chem et al. (2018).

Bangladesh is one of the densely populated countries in the world. Gopalganj (Map), a district in the Dhaka division of Bangladesh has about 1,172,415 civilians. Its total land area is 1,468.74 km², where 800 people live per square kilometer (https://en.wikipedia.org/wiki/Gopalganj_District,_Bangladesh).



Figure 1: The quality of drinking water is not so good in most of the regions of this district. Therefore, waterborne diseases, especially pathogenic bacterial infectious frequently occur among the people, leading to take antibiotics on a regular basis. Furthermore, patients with other disease conditions also experience in various groups of antibiotics.

We performed a survey on the misuse of antibiotics among 1000 patients in Gopalganj district, aiming to understand the antibiotic usage fact of developing antibiotic resistance among them.

Materials and methods

Study design & questionnaire

A retrospective and cross-sectional survey was designed to assess the misuse of antibiotics and associated development of antibiotic resistance. A questionnaire was developed, regarding to antibiotic consumption and associated complications among the people. A signed consent form for this study was provided by the Department of Pharmacy, Bangabandhu Sheikh Mujibur Rahman Science and Technology University, Gopalganj-8100, Bangladesh was disclosed to the willingly participated patients and medical practitioners, which was served as an ethical consideration.

Population, age, area and time

Data were collected from 1000 people, age between 15 to 80 years in Gopalganj district, Bangladesh during January to April, 2018. Both in-patients and out-patients in different hospitals, clinics and some medical college and hospitals were selected in this case.

Data collection and statistical analysis

From the willing patients, we collected primary data. These data were then analyzed by using Microsoft Excel 2007 and GraphPad Prism (version 6.5).

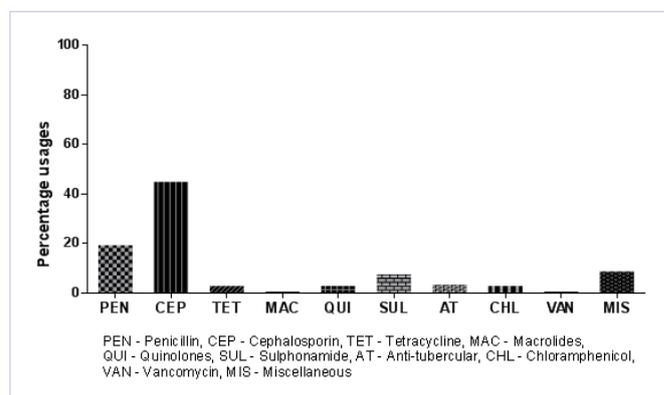
Results

Table 1 suggests that common cold, cough, fever, and gastric ulceration are frequently occurring diseases among the sample patients. However, urinary tract infection (UTI), diarrhea, appendicitis, and asthma were also prominent.

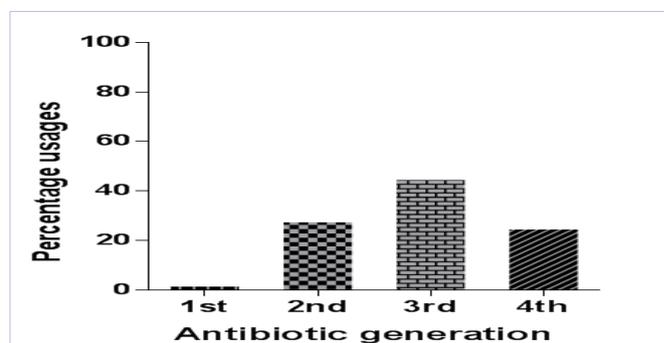
Diseases	Percentage (%)
Allergy, skin rash and itching	2.5
Appendicitis	6.0
Arthritis and joint pain	3.5
Asthma	6.0
Cancer	0.5
Cold, cough and other related diseases	19.7
Cardiovascular (CVS) diseases	3.5
Diabetes	2.0
Diarrhea	6.5
Eye diseases	1.5
Fever	16.5
Gastric ulceration	13.0
Jaundice and lever diseases	2.8
Mental disorder	0.5
Post-operative complication	5.5
Thyroid problem	2.0
Urinary tract infection (UTI)	8.0

Among the antibiotic misusers, 55% were male patients. Most of the antibiotic prescribers were the Bachelor of Medicine and Bachelor of Surgery (MBBS) doctor (58%), which is then followed by self-medication (15.74%), quack (15.23%) and Bachelor of Dental Surgery (BDS) (11.16%). According to Graph 1, cephalosporin and penicillin users were more prominent than the other groups of antibiotics.

Third generation antibiotics were seen in the patients than the 2nd, 4th and 1st generation (Graph 2) 75% patients were found to use antibiotics without clinical diagnosis test report. On the other hand, 77% patients were seen to take antibiotics in an incomplete manner.



Graph 1: Commonly used antibiotics by the patients



Graph 2: Used antibiotic generations among the patients

Discussion

Antibiotics reduce the burden of common infectious diseases and become essential for many medical interventions. Antibiotic resistance, a specific type of drug resistance is the ability of a microorganism to withstand the effects of an antibiotic. The loss of efficacy against common pathogens has not only led to a shift towards more expensive antibiotic drugs in high-income countries, but also to increased morbidity and mortality in low-income and middle-income countries [8].

Therefore, identification of spatial and temporal trends in antibiotic consumption is important to understand the epidemiology of antibiotic resistance. First, identification of regions in which rate of consumption of antibiotics per person is high or rising can rapidly predict where the threat of new resistant

infections will be greatest and can help to inform initiatives to preserve antibiotic efficacy [10]. Second, the mapping of the distribution of antibiotic consumption provides a baseline for the assessment of efforts for the future antibiotic drug reduction [11].

The rationale for educating the public is that knowledge about antibiotic treatment and awareness of antibiotic resistance are thought to influence patient and parent demand for antibiotic prescribing [12]. As irrational drug use not only poses a health hazard to the individual and the society, but it also has a variety of medical, economic and social impacts. On the other hand, rational drug use promotes cost-effective therapy and quality of care.

In this study, irregular usage, usage without diagnosed situations, self-prescribing behavior of the patients, and dose incomplete were seen among the patients.

Conclusion

A number of facts have been seen from the misuse and the development of antibiotic resistance among the patients in Gopalganj district, Bangladesh. Adequate precautions should be taken by the local government and prescribers to manage the current situation.

Acknowledgement

We are grateful to all the patients, physicians, authority of the hospitals & clinics, diagnostic centers, and finally to the Bangabandhu Sheikh Mujibur Rahman Science and Technology University (BSMRSTU), Gopalganj-8100, Bangladesh for the permission and providing facilities to conduct this study.

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