

Analysis of prescription pattern of antibiotic drugs on patients suffering from ENT infection within Dhaka Metropolis, Bangladesh

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ABSTRACT

Background: This survey was designed to assess and evaluate the prescription pattern of antibiotic drugs on patients suffering from ENT infection within Dhaka Metropolis, Bangladesh.

Methods: A cross sectional, observational and prospective study was conducted from January to June 2015 in the out-patients (OPD) and in-patients (IPD) of ENT department at different general and specialized government and private hospitals (Dhaka Medical College and Hospital, Sir Solimullah Medical College Mitford Hospital, Holy Family Red Crescent Medical College and Hospital, Dhaka Community Medical College and Hospital) within Dhaka city. 300 prescriptions were collected and randomly evaluated for this present study.

Results: Out of 300 patients, 220 (73.33%) were male and 80 (26.67%) were female (including children and adults) where most of the patients were outpatients 262 (87.33%). In the patients information section it was observed that approximately 93.33% prescription contained antibiotic drugs and almost all prescription (100%) contained antibiotic drugs along with other drugs such as 80.67% PPI (proton pump inhibitors), 76.67% analgesic and 51.33% vitamin/iron supplements. From this analysis we found that 19.33% prescription contained single antibiotic drug, 80.67% contained two antibiotic drugs and no prescription contained more than two antibiotic drugs. Most of the prescribed drugs were administered orally (12% capsule, 80% tablet form). Out of 473 prescribed antibiotic drugs majority of them lie under β -Lactam (54%) class followed by cephalosporin (46.33%) class in which maximum drugs (92%) were prescribed by their brand names.

Conclusions: Prescribing more than one antibiotics was commonly encountered in this study indicating the occurrence of polypharmacy. Interventions to rectify over prescription of antibiotics, use of brand names, inadequate labelling of drugs is necessary to improve rational drug use. Standard treatment guidelines, hospital formulary, and educational intervention become essential to modify this behaviour to benefit the patient.

Keywords: Antibiotics, Brand name, Bangladesh, ENT infections, Generic name, Polypharmacy, Prescribing pattern

INTRODUCTION

Generally, in most developing countries infectious diseases are among the commonest causes of morbidity

and mortality¹ Diseases of the ear, nose and throat (ENT) are very common in both children and adults and often responsible for significant morbidity which causes impairment of daily life, distress and rarely mortality.² According to the world health report of 2010, it has been

estimated that respiratory infections were the fourth major cause of mortality which is responsible for global number of deaths and on the other hand it also generated that 94.6 disability adjusted life years lost worldwide.³ In the United States to seek treatment for individuals most common reasons such as ENT infections including non-specific upper respiratory tract infection (URTI), acute bronchitis, sinusitis, and Otitis Media (middle ear infection) are responsible that's why upto 75% antibiotics are used.⁴

An upper respiratory infection (URI) is a viral or bacterial infection that affects the nose, throat (pharynx), sinuses, and voice box (larynx) the most familiar upper respiratory infections include the common cold (rhinopharyngitis), infection of the throat (pharyngitis), tonsils (tonsillitis), the maxillary sinuses behind the nose (sinusitis), and the larynx (laryngitis). Ear infections (acute otitis media) are another manifestation of URI (upper respiratory infection).^{5,6} According to a recent study, acute respiratory infections are the most frequent reason for seeking medical attention and are the reason for 75% of the antibiotic prescriptions each year.⁷ As these ENT infections are generally caused by microorganisms such as bacteria, fungi and viruses, the ultimate aim of the drug therapy of ENT infections is to eradicate infections and minimize the morbidity and the complications associated with them by using appropriate antimicrobials.^{8,9} An ear infection is caused by a bacteria or virus in the middle ear.¹⁰

Mainly ear pain, fullness in ear, hearing loss, ringing in the ears, discharge, nausea, vomiting and vertigo are the symptoms of ear infections.¹¹ Some others ear diseases are otitis media with effusion and fluid buildup in the middle ear and chronic suppurative otitis media, a persistent ear infection resulting in tearing or perforation of the eardrum.¹⁰ Sinus infection is the mostly common disease of nose. Teeny holes that connect nasal passage to sinuses get blocked and causing growth of microorganisms leads to sinus infection. Viruses are mainly responsible for this where antibiotic don't work in sinus infection as they only kill bacteria.¹¹ Drug utilization studies are important to facilitate rational use of drugs in populations. The drug utilization studies also relate to the beneficial or adverse effects of drug use in health care system.¹²

Drug utilization usually varies among different countries and even among health institutions within a country.¹³ The studies of drug utilization identify the problems that arise from drug usage in healthcare system as well as remark the current approaches to the rational use of drugs.¹⁴ Antibiotic is a highly misused medicine in present scenario.¹⁵ Over use of antibiotics is a problem that continues to gain attention from national organizations as a significant threat to public health.¹⁶ In Afghanistan Over-consumption of antibiotics is a realistic threat in aid-supported settings and may be linked to the observed high prevalence of antibiotic resistance

there.^{17,18} Some concerns about overuse of antibiotics are that it leads to unnecessary cost and the potential of adverse effects for the individual taking the antibiotic. But even more important concern is the adverse effect on public health due to the development of antibiotic resistant bacteria.¹⁹ The results of different surveys were in agreement showing that antibiotic preparations were given in approximately 40% of all consultations of rhino pharyngitis and in 80% of those with acute bronchitis, and antibiotics were prescribed in more than 90% of cases of pharyngitis, irrespective of the age of the patients. In a publication from Thailand, more than 80% of the prescriptions for upper respiratory tract infections contained antimicrobials.²⁰ In practice, one of the most common irrational uses of medicines is excessive prescription of antimicrobials.²¹ According to a recent report by the World Health Organization (WHO) on antimicrobial resistance, death from an infectious illness is twice as likely to occur when a resistant bacteria is the causative pathogen.²²

As irrational use of antibiotics increases the chances of development of antibiotic resistance in a community, so it needs of studying the antibiotic prescription pattern of the physicians, so as to ensure judicious use of antimicrobial agents.²³ Assessment of drug use patterns is becoming increasingly necessary to promote rational drug use and before activities are started to promote rational drug use, an effort should be made to describe and quantify the already existing situation.^{24,25} Therefore, it is important to evaluate and monitor the prescription patterns from time to time to increase the therapeutic benefit and decrease the adverse effects to optimize the medical services for the patients.²⁶ In 2014, a study on prescription pattern of antibiotics in Bangladesh was conducted by Mohitosh et al.²⁷ They found that antibiotics prescription rates was particularly high in pediatric and geriatric population because these populations are more prone to infections associated with ear nose and throat.²⁸

Most of antibiotics were prescribed for the acute respiratory infection; a result which substantiates findings from other Asian countries.²⁹⁻³¹ They also found that their results are also consistent with findings in China, where low-severity illness was a major reason for giving children antibiotics.³⁰ On the other hand, in 2015 Chowdhury et al. conducted a survey in Bangladesh and their findings involved significant percentage of patients receiving antibiotics in Bangladesh.³² Such finding was relevant to the reports on antibiotic usages in other parts of Asia, Europe or America.^{28,33-35} It is a concerning matter that almost 27% patients are unconscious about the completion of antibiotic course. This unconsciousness leads the antibiotic resistance which might be a vulnerable threat of public health condition in future.^{36,37}

Female patients are more unconscious than male and the lack of education might also be a strong reason for that. However, still very little information exists about the prescription pattern in the ENT infection in Bangladesh.

Therefore, the present study was undertaken to scrutinize and analyze the antibiotic prescribing pattern of physicians in treating ear, nose, and throat disordered patients from ENT department of a number of government and private hospitals in Dhaka Metropolis, Bangladesh.

METHODS

A cross-sectional, observational hospital based study was conducted in order to evaluate prescription pattern of antibiotic drugs in patients with various infectious diseases. On the basis of inclusion and exclusion criteria prescriptions were collected from all patients (both male and female) attended the ENT outpatient (OPD) and inpatient departments (IPD) at different general and specialized government and private hospitals within Dhaka city. The methodology for the current survey was adapted in a way where statistical procedures were solely used. For better understanding, the methodology has been designed to follow a number of steps including selection area, duration of survey, sampling, data collection, data processing and graphical representation and specification.

Study site

In order of getting perfect data, proper selection of survey area is necessary since this represents the actual condition of disease prevalence and the pattern of prescribing medicine accordingly. The capital city of Bangladesh is the living place of 10 million people. The city (Dhaka) is highly concentrated with Government and Private Hospitals as well as other community health services. The present study was conducted in a number of well known general and specialized government and private hospitlas in Dhaka, Bangladesh.

Duration of survey

The present survey was held for six months, from January to June of 2015. This period of time partly covered most important seasons including winter and summer as well as the entire monsoon season of Bangladesh. As a result,

this time span not only covered the general and complicated diseases but also the seasonal diseases like cold, flu, hay fever etc. of our country. Nevertheless, most seasonal diseases are associated with Ear, Nasal and Throat (ENT) infections.

Study design and data collection

Designing the pattern of sampling is a definite plan for obtaining a sample from a given area. This refers to the technique or the procedure that has been followed by the surveyors in selecting items for the sample. The information that was collected from the survey areas was related to the prescribing and marketing pattern of antibiotics and other drugs of Bangladesh. A number of criteria were considered for analyzing the prescriptions that include; presence of antibiotics, number of prescriptions containing multiple antibiotics, class of antibiotic, dosage forms and combination of other drugs.

Inclusion criteria

The patients taken in consideration for the present survey included male and female with the age range of below 10 and above 60 years. The types of patients were out-patient and post operative patients (inpatients) with the total number of 300. The population of patients covered, male and female as well as both urban and rural communities. However, most patients of our survey were from rural population with low literacy level.

The task of collecting data had been preceded after the survey design/plan was chalked out. There were two types of data, primary and secondary. The primary data were obtained through observation and direct communication with patients. The secondary data involved collection of prescription and sorting of data by conducting a pilot survey to fill the survey form shown in Table 1. The survey form was prepared based on the prescribing indicator form of WHO drug use indicators, so that it meets all the parameters necessary for evaluating objectives and also kept it as simple and short as possible.¹⁶

Table 1: A sample of survey form.

Serial No.	Age	Antibiotic drugs		Brand name	Generic Name	Manufacturing Company	Dosage form	Diagnosis
		Yes	No					

Data specification

After collecting the prescriptions, we analyzed each prescription thoroughly; firstly we have checked which prescriptions contained antibiotic drugs and which did not. Secondly, we have observed which class of antibiotic

drugs prescribed. Thirdly, we have noticed in the case of dosage forms (oral and injectable), what are the kinds of antibiotic drugs were present and in what percentage.

Furthermore, the following parameters were taken into account while sorting the data based on the manual of WHO drug indicators.¹⁶

- Average number of drugs per encounter.
- Percentage of drugs prescribed by generic name.
- Percentage of encounters with one or more antibiotic prescribed.
- Percentage of encounters with oral drugs.
- Percentage of encounters with injectable.

Statistical analysis

Descriptive statistics were enacted to the collected data associated with patients’ demographic information and prescribed drugs by using Microsoft Excel Software. The results were expressed as proportions or as percentages in terms of Table, Figures, pi chart and bar diagram.

RESULTS

This survey was mainly designed to see the prescription pattern of antibiotic drugs which are prescribed for ENT department of Hospitals in Dhaka city where a total of 300 medical case records were collected, scrutinized and analyzed for drug prescription over a period of 6 months. Out of 300 patients, 220 (73.33%) were male and 80 (26.67%) were female (including children and adults) are shown in (Table 2). Considering the exclusion and inclusion criteria 300 prescriptions were taken into account among which 262 (87.33%) were outpatients while 38 (12.67%) were inpatients (Table 2).

Table 2: Tabular representation of demographic data of patients.

Gender of patients			Patients types		
Gender	No. of patients	(%)	Types of patients	No. of patients	(%)
Male	220	73.33 %	Outpatients	262	87.33 %
Female	80	26.67 %	Inpatients	38	12.67 %

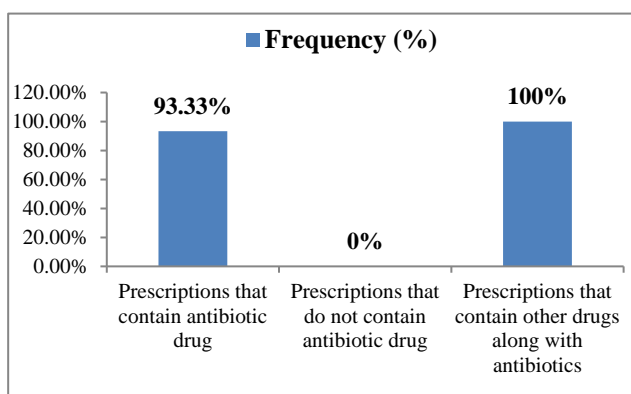


Figure 1: Percentage of demographic of antibiotic drugs.

In the patients’ information section almost all the patients were suffering from ear, nose and throat infections. It was observed that the medication for all these common ENT

infections involved antibiotic drugs along with other drugs (Figure 1). Approximately 93.33% prescription contained antibiotic drugs and almost all prescription (100%) contained antibiotic drugs along with other drugs as shown in (Figure 1).

Analyzing the prescriptions

The prescriptions were sorted on the basis of prescriptions containing single and multiple antibiotic drugs as well as prescriptions containing some other drugs like pain killers or PPI (proton pump inhibitors) drugs along with the antibiotics. From this analysis we found that 19.33% prescription contained single antibiotic drug, 80.67% contained two antibiotic drugs and no prescription contained more than two antibiotic drugs as shown in (Figure 2).

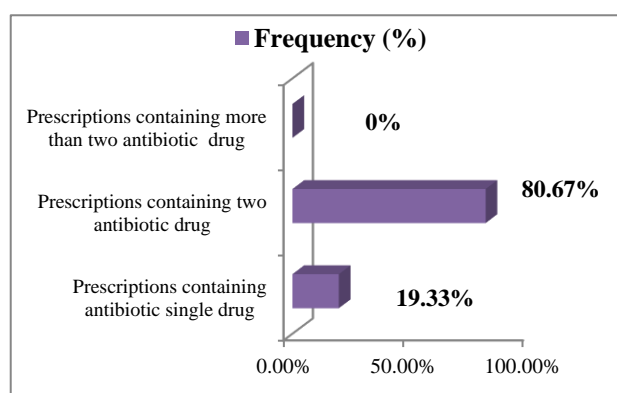


Figure 2: Percentage of number of antibiotics prescribed.

However, 80.67% prescriptions contain PPI (proton pump inhibitors), 76.67% contain analgesic and 51.33% contain vitamin / iron supplements (Figure 3).

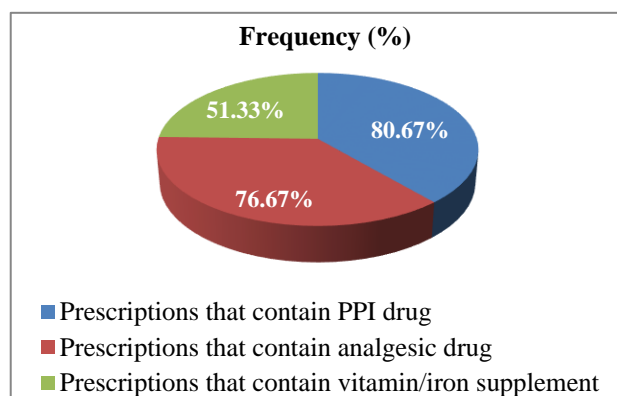


Figure 3: Percentage of other drugs involving PPI, analgesic and supplements prescribed with antibiotics.

It was found that antibiotics like Amoxicillin 500mg, Moxaclav 625mg, Zevonix 250mg, Florocin 500mg, Cefronim 500mg etc. were mostly used for the treatment of out-patients in the hospitals. Other drugs like Paracetamol 500mg was commonly used to reduce the

pain, while Antihistamin drugs and PPI drugs (omeprazol, esomeprasol etc) were used in combination with the antibiotics. On the other hand, antibiotics including Ceftioxon (1gm vial), Flucloxx 500mg were concurrently used with Ciprofloxxacin 500mg for most post-operative patients. Furthermore, in case of post-operative patients voltarin suppository was mainly used to remove pain and PPI drugs were also prescribed to avoid GI disturbances. The antibiotic drugs were found in different dosage forms. Available dosage forms with their respective frequencies are shown in (Figure 4).

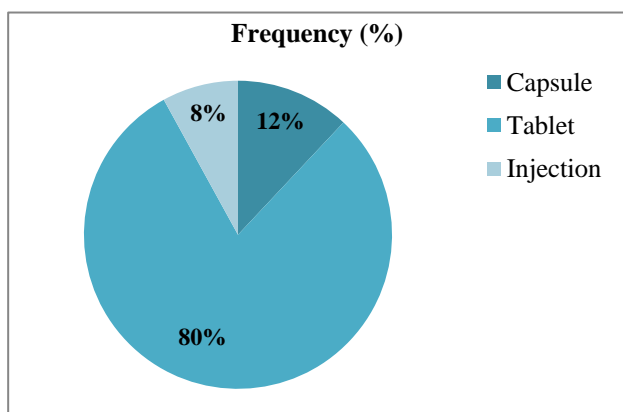


Figure 4: Usage of different dosage forms of antibiotics in percentage.

From Figure 5 it was found that drugs are mainly introduced by their brand names as most of our physicians mentioned the brand name (92%) of the medicine instead of the generic name (8%) while prescribing antibiotics or any other drugs.

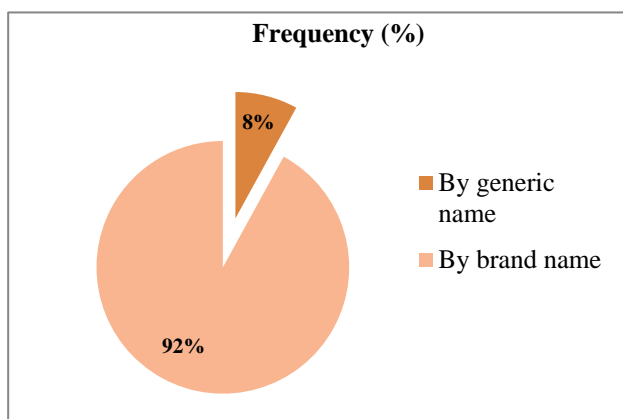


Figure 5: Percentage of prescription declaring brand name or the generic name of antibiotics.

Classification of prescribed antibiotics

Among the 300 collected prescriptions, all prescriptions were found containing one or more antibiotic drugs. A total number of 473 antibiotic drugs were present which belonged to different classes. Some important classes of

antibiotic drugs and their respective frequencies of usage are shown in (Figure 6).

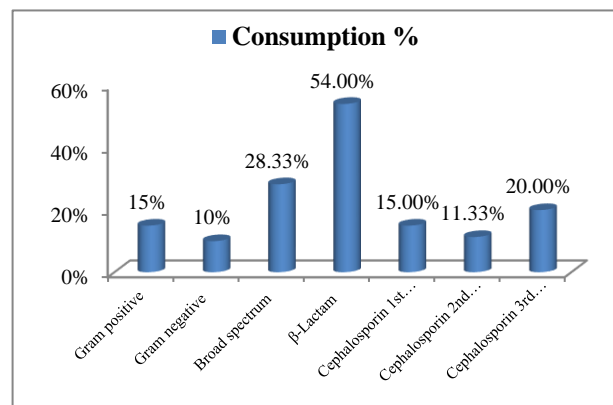


Figure 6: Important classes of antibiotic drugs that are commonly prescribed for the treatment against infectious diseases associated with ENT in Bangladesh.

DISCUSSION

A prescription which is given by a doctor or physician is taken as an indication of the doctor’s or physician’s attitude towards the disease and the role of drugs in its treatment.³⁸ The central priority of health care system is providing the right medicine to the right people at the right time.³⁹ The source of data for the current survey involved prescriptions of patients suffering from infectious diseases associated with ENT that was collected from ENT department of hospitals in Dhaka city. This survey, to some extent, helped to overcome the deficiency of data regarding antibiotic prescribing pattern in ENT departments from various government and private hospitals of Dhaka metropolis. For this purpose most prospective general and specialized government and private hospitals of Dhaka city were covered to count and examine the prescriptions. In this present study 300 medical cases were collected. In this study out of 300 patients 262 (87.33%) were outpatients while 38 (12.67%) were inpatients (Table 2). The percentages of male and female patients were 73.33% and 26.67% as shown in (Table 2) where most of the patients were male. Similar results were obtained from the previous study which was conducted by Khan et al. 2011.⁴⁰ This prospective study was conducted on 4800 patients who visited the OPD and IPD of ENT department of Teerthanker Mahaveer Medical Hospital and Research Centre of North India. Their result indicated that higher percentage of male person suffering from ENT infections. Similar result was found in previous surveys conducted in India and Nepal in different years with varying number of patients.^{38,41-45}

The present observation remarked that the medication for all common ENT infections involved antibiotic drugs along with other drugs. The survey reported that 93.33% prescription contained antibiotic drugs and almost all

prescription (100%) contained antibiotic drugs along with other drugs as shown in (Figure 2). On the basis of the results of prescription analysis about 19.33% prescription contained single antibiotic drug, 80.67% contained two antibiotic drugs and no prescription contained more than two antibiotic drugs as shown in (Figure 3). This result indicated polypharmacy. Polypharmacy is known to cause unnecessary adverse reactions, drug interactions, and complications.⁴⁶ On the other hand, 80.67% prescriptions contained PPI (proton pump inhibitors), 76.67% contained analgesic and 51.33% contained vitamin/ iron supplements (Figure 4). Frequency of analgesic prescription in our study is the highest reported among studies from other countries (11.9% to 30%).⁴⁷⁻⁵⁰ Compared to multivitamin prescription of our study (37.8%) other studies in the region report varying frequencies from 5.9% to 50%.^{48,49,51-53} Most of the prescribed drugs were administered orally (12% capsule, 80% tablet form) which was found to be similar as previous study in 2015 where 855 prescriptions were evaluated from SRTR Government Medical, Maharashtra, India.⁵⁴ In our present study most of the drugs (92%) were prescribed by brand name which coincides with the report from the survey conducted by previous study.^{54,55}

A total number of 473 antibiotic drugs were found in 300 prescriptions among which antibiotics that lie under β -Lactam class were most commonly prescribed. A similar incident was reported in the previous study.^{20,40,41,56-58} Besides, 46.33% cephalosporin, 28.33% broad spectrum, 10% gram negative and 15% gram positive antibiotic agents were observed to be prescribed in the present survey.

CONCLUSION

A study of prescribing pattern of antibiotics is an effective way of reflecting appropriateness of antibiotic use. This current survey concluded that all the study patients diagnosed with ENT infections were prescribed with antibiotics. As the present work involved analyzing only 300 prescriptions therefore to obtain a better understanding of prescription pattern of antibiotic drugs for ENT infectious patients it is necessary to accumulate more prescriptions in future. However, the present survey report highlighted that antibiotics of β -Lactam class were commonly used followed by cephalosporin class and maximum drugs were prescribed by their brand names. Most of the prescriptions were found with two antibiotics which indicated polypharmacy. The present observation indicated that majority of patients were not used the regimen in accordance with the current guidelines. Moreover, many local physicians were found to prescribe multiple antibiotics without undergoing any culture or sensitivity test. As antibiotic resistance has become a big health issue in Bangladesh it is highly necessary to focus on rational use of antibiotic and motivate the physicians to prescribe the generic drugs too.

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Conflict of interest: None declared

Ethical approval: The study protocol was approved by the ethics committee of the Department of Pharmacy, Primeasia University, Dhaka, Bangladesh. The present survey was conducted in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki

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