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Dental Pharmacology

Pattern of Disease among patient attending in Outpatient Department in a Tertiary Hospital

Dr. Monika Roy[1*], Dr. Sushanta Kumar Barman[2], Dr. Muhammad Ehasun Uddin Khan[3], Dr. Priobrata Karmakar[4], Dr. Muhammad Anamul Hoque[5], Dr. Purabi Barman[6], Dr. Ratindra Nath Mondol[7]

[1]Lecturer, Dental Pharmacology, Rangpur Medical College, Rangpur, Bangladesh
[2]Medical Officer (IMO), Rangpur Medical College Hospital, Rangpur, Bangladesh
[3]Assistant Professor, Department of Nephrology, Dhaka Medical College, Dhaka, Bangladesh
[4]Assistant Professor, Department of Medicine, Rangpur Medical College, Rangpur, Bangladesh
[5]Registrar (Consultant in situ), Department of Medicine, Shaheed Syed Nazrul Islam Medical College Hospital, Kishoregonj, Bangladesh
[6]OSD (Deputation- Sir Salimullah Medical College), DGHS, Dhaka, Bangladesh
[7]Society of General Physicians and Daktarkhana (GP center), Dhaka, Bangladesh

| **Abstract** | **Original Research Article** |

Objective: To find out the common diseases in which antibiotics are used among patients of outpatient department of Dhaka Medical College & Hospital. *Method:* This Observational Cross-sectional Descriptive study was conducted in in outpatient department of Medicine, Surgery, Gynaecology and Obstetrics of Dhaka medical college & Hospital. Later the study was compiled in the Department of Pharmacology, Dhaka Medical College. Total study period was one year extending from January, 2019 to December Patients in outpatient department of Medicine, Surgery, Gynaecology and Obstetrics of Dhaka Medical College & Hospital. *Result:* This study was carried out to determine the common antibiotics & diseases in which antibiotics are used among patient in outpatient department of a tertiary care hospital. A total 2404 prescriptions was screened in this study, among 600 prescriptions containing antibiotics purposively selected according to inclusion and exclusion criteria from different outpatient of Medicine, Surgery and Gynaecology & Obstetrics department of Dhaka Medical College and Hospital to reach the end of the study. *Conclusion:* The disease burden of Bangladesh is moving from communicable to non-communicable diseases the major causes of morbidity and mortality in our country are infective diseases and therefore antibiotics are the most widely used group of medicine.
Keyword: Disease, ,Antibioticmicroorganisms, prescriptions, bacterial resistance.

INTRODUCTION

The history of advancement of modern medicine must include the inventions in the field of antimicrobial chemotherapeutics. 'Bacteria invented antibiotics billions of years ago.[1] Among medicines antibiotics are used to prevent and treat bacterial infections. As infections are the major reason for the poor prognosis of a condition, proper control of infections can prevent certain co-morbid or morbid situations. It is known that a coin has two sides; just like that antibiotics also have two sided effects. One is control of infection; the other is the resistance of an organism. [2]

Prescription with antibiotics is mostly made on empirical basis and broad-spectrum. This is influenced by interplay of the knowledge, expectations of prescribers and patients, economic incentives, characteristics of a country's health system and the regulatory authority. Patient-related factors those enforce inappropriate antibiotic use are belief and perception towards medication and non-adherence to treatment. In addition, poor education, absence of guideline, lack of resources, poor training, patient load and inaccessibility of antibiotics can cause irrational use of antibiotics. This inappropriate antibiotic use leads to adverse drug effects, increase cost, increase the mortality and the morbidity and emergence of resistance. [3]

Drug utilization study is a process of medical audit that involves monitoring and evaluation of the prescribing patterns of drug and also helps to modify the prescribing practices to achieve rational therapeutic use as well as to prevent the economic load which will improve health care system. Therefore, monitoring and evaluation of prescribing patterns of antimicrobial agents are one of the recommended techniques to control resistance and also to improve the prescribing practices. [4]

A study done in Chittagong Medical College Hospital and Chattagram Ma-O- Shishu Hospital showed that microbes causing Hospital acquired infections are commonly found in the environment of healthcare infrastructure in Bangladesh. These microbes also show different levels of susceptibility to antibiotics commonly used in Bangladesh. The common microbes identified are Gram positive Streptococcus, S. aureas, coagulase negative Staphylococcus, Gram negative Pseudomonas and Serratia. Almost all of these microbes show resistance to cefipime, a fourth generation of cephalosporin. However, ciprofloxacin and vancomycin shows to be most effective against the above identified bacteria. [5]

Another study on stool samples were collected from diarrhoeal patients attended the Sheikh Hasina Medical College and Hospital, Tangail. 31% were positive for both ETEC and EPEC strains, 23% were positive for ETEC strains, and 8% were positive for EPEC strains. It was detected that 82.60%, 65.21%, 73.91%, 78.26%, 47.82%, 60.86%, and 47.82% of ETEC strains were resistant to amoxicillin–clavulanic acid (AMC), tetracycline (TE), nalidixic acid (NA), azithromycin, ciprofloxacin, ampicillin (AMP), and erythromycin (E), respectively. Whereas it was detected that 87.5% EPEC strains were resistant to AMC, AMP, and E, 75% EPEC strains were resistant to TE and NA, respectively. Both strains developed multidrug resistance to commonly prescribed antibiotics. [6]

Bangladesh has achieved promising progress in the manufacturing of quality medicine after the promulgation of Drug (Control) Ordinance-1982. As a consequence, Bangladesh is now exporting their quality medicine to near about 80 foreign countries, but the total health care system in this country has not reached to the desirable stage. A lot of factors provoking the situation worsen day by day. One of the major causes is the prescription errors. [7]

Almost half of all medicines globally are used irrationally. Medicine experts in WHO say irrationality can have severe consequences: adverse drug reactions, drug resistance, protracted illness and even death. In addition, the financial cost incurred by individuals and governments due to irrational use is unnecessary and often extremely high, particularly in developing countries where patients often pay for medicines out of pocket. Irrational use of medicines includes over treatment of a mild illness, inadequate treatment of a serious illness, misuse of anti-infective drugs, over-use of injections, self-medication of prescription drugs and premature interruption of treatment. Data from many countries show that such practices are frequent, and not exclusive to developing countries (WHO, 2014). [8]

Dynamic online antimicrobial guideline with stewardship program was attempted in Bangabandhu Sheikh Mujib Medical University (BSMMU) to improve the antimicrobial prescribing. [9]

OBJECTIVE
General objective:
- To find out the common antibiotics & diseases in which antibiotics are used among patients of outpatient department of Dhaka Medical College & Hospital.

Specific objectives:
- To observe the antibiotics used empirically and/or definitivly among patients of outpatient department of Dhaka Medical College & Hospital.
- To see whether the antibiotics used are based on updated BSMMU guidelines.

METHODOLOGY

Type of study	Observational Cross-sectional Descriptive study.
Place of study	The study was carried out in outpatient department of Medicine, Surgery, Gynaecology and Obstetricsof Dhaka medical college & Hospital. Later the study was compiled in the .rtment of Pharmacology, Dhaka Medical CollegeDepa
Study period	One year extending from January, 2019 to December,.2019
Study population	Patients in outpatient department of Medicine, Surgery, Gynaecology and Obstetrics of Dhaka Medical College & Hospital.
Sampling technique	Purposive

Sample selection criteria
Inclusion criteria:
- Patients of both gender and aged >18 years.

- Patients attending outpatient department of (Medicine, Surgery and Gynaecology & Obstetrics) of Dhaka Medical College and Hospital.
- Patients who are prescribed with antibiotics.
- Patients who are willing to give consent.

Exclusion criteria:
:Following patients were excluded from the study
- Patients of either gender and aged <18 years.
- Patients' needs admission on inpatient department of (Medicine, Surgery, & Gynaecology & Obstetrics) of Dhaka Medical College and Hospital.
- Patients who are not prescribed with antibiotics.
- Patients who are not willing to give consent.

Sample Size:

know, n We= $\frac{z^2pq}{d^2}$

,Where, For highest sample size determination we took
p= Expected proportion of event/Prevalence or proportion of occurance=0.5
0.5=0.5-p=1-q= 1
d=Acceptable error=0.05
Z= 1.96 at 95% confidence interval

n ,So= $\frac{z^2pq}{d^2}$ n = = $\frac{1.96 \times 1.96 \times 0.5 \times 0.5}{0.05 \times 0.05}$ 384=

According to the manual titled "How to investigate drug use in health facilities", minimum encounters for a cross sectional survey is 600 (WHO, 1993). So, for this study, I shall include 600 prescriptions from outpatient department (Medicine, (urgery&Gynaecology and obstetricsSof Dhaka Medical College & Hospital.

Data Collection Instruments and Procedure:

After taking verbal consents from the patients attended in outpatient medicine department of Dhaka Medical College and Hospital, the prescriptions were seen and sorted whether prescription contained antibiotic or not. If the prescription had no antibiotic then it was recorded in data collection form as an entry only to be utilized to calculate the proportion of antibiotic prescribing. If prescription contained antibiotic then written informed consent was taken from patient and the picture of those prescriptions were captured by a photo capturing device. Later on, the photo of antibiotic containing prescription was screened and reviewed to record in the data collection form.

RESULT
Demographic Characteristics of the Study Patients
Age Distribution of Study Patients

Table-1: Distribution of study patients by age in years (N= 600)

Age range of respondents	Frequency	Percentage
≤20	63	10.5
21-40	445	74.1
41-60	81	13.5
61-80	11	1.9
Mean ± SD (Range)	31.80 ± 10.92 (20-43)	

Table-1; illustrates that the highest antibiotic usage age group was 21-40 years which occupied 445 (74.1%), followed by 41-60 years 81(13.5%), ≤20 years 63 (10.5%) and the lowest age group 61-80 years 11(1.9%). Minimum age of patients of this study was 18 years, Maximum age of this study was 77 years. The mean age was 31.80 years and SD was 10.92 years.

Monthly Income and Educational Status of Study Patients

Table-2: Distribution of monthly income of study patients (N=600)

Variable	Frequency	Percentage
Monthly Income		
Range in taka		
≤ 20,000	460	76.7
20,001-40,000	121	20.2
>40,000	19	3.1
Educational status		
Illiterate	128	21.3
Primary education	175	29.1
Below SSC	142	23.6
Below HSC	89	14.8
Graduate	35	5.8
Post-graduate	31	5.4

Table-2: shows that 460 (76.7%) study patients earned ≤ 20,000 taka monthly, 121 (20.2 %) earned 20,001-40,000 and 19 (3.1%) earned >40,000 taka monthly. Most of patient's monthly income below 20, 000 taka. Most of Patients were primary educated (29.1%).

Table-3: Department wise distribution of study subjects receiving antibiotics (N=600)

Name of outpatient Department	Patient attend Number (Percentages)	Prescribed antibiotic Number (Percentages)
Medicine	625 (26.0 %)	200 (32.0%)
Surgery	704 (29.2%)	200 (28.4%)
Gynaecology & Obstetrics	1075 (44.8%)	200 (18.6%)
Total	2404 (100%)	600(24.9 %)

In this study 24.9 % Patients of outpatient department received antibiotic. Among them Medicine was (32%), Surgery was (28.4%), Gynecology & obstetrics was (18.6%). Most of prescribed antibiotics were in Medicine outpatient department.

Duration of Antibiotic Therapy

Table-4: Department wise and Proportion of Duration of antibiotic therapy (N=600)

Duration	Medicine	Surgery	Gynaecology & Obstetrics	Total
(Days)	n(%)	n(%)	n(%)	n(%)
≤ 3	1 (0.5%)	1 (0.5%)	0 (0%)	2 (0.3%)
4-7	179 (89.5%)	167 (83.5%)	119 (59.5%)	465 (77.5%)
8-14	20 (10.0%)	32 (16%)	76(38%)	128 (21.4%)
>14	0 (0.0%)	0 (0%)	5(2.5%)	5 (0.8%)
Total	200 (100%)	200 (100%)	200 (100%)	600 (100%)

Table-4: shows that the highest duration of antibiotic therapy was 4-7days 465 (77.5%) followed by 8-14 days 128 (21.4%), ≤ 3days 2 (0.3%) and >14 days 5(0.8%).

Medical Conditions in Outpatient Department (OPD) Where Antibiotics Were Used

Table-5: Medical conditions in Medicine OPD where antibiotics were used (n=200)

Name of diseases	Frequency	Percentage
Respiratory tract infections	115	57.5
Pharyngitis	26	13.0
Enteric fever	21	10.5
Urinary tract infections	12	6.0
Gastroenteritis	22	11.0
Skin and soft tissue infections	4	2.0
Total	200	100

Table-5: shows, In medicine OPD respiratory tract infections 115 (57.5%) is most common disease where antibiotics used followed by pharyngitis 26 (13%), gastroenteritis 22 (11%), enteric fever 21 (10.5%), urinary tract infections 12 (6%), skin and soft tissue infections 4 (2%) respectively.

Table-6: Proportion of medical conditions in gynaecology OPD where antibiotics were used (continued) (n=200)

Name of diseases	Frequency	Percentage
Pelvic inflammatory disease	83	41.5
Valvovaginitis	64	32.0
Urinary tract infections	46	23.0
Bartholin abscess	7	3.5
Total	200	100

Table-6: shows that among Gynaecology OPD, pelvic inflammatory disease 83 (41.5%) is most common conditions where antibiotics are used followed by, valvovaginitis 64 (32%), urinary tract infections 46 (23%), bartholin abscess 7 (3.5%) respectively.

Table-7: Proportion of medical conditions in Surgery OPD where antibiotics were used (continued) (n=200)

Name of diseases	Frequency	Percentages
Abscess	62	31.0
Cellulitis	26	13.0
Wound infections	26	13.0
Paronychia	25	12.5
Boil	23	11.5
Infected cysts	19	9.5
Urinary tract infections	10	5.0
Diabetic foot	9	4.5
Total	**200**	**100**

Table-7: shows, in surgery wards abscess 62(31%) were most common diseases where antibiotics used followed by cellulitis 26 (13%), wound infections 26 (13%), paronychia 25 (12.5%), boil 23 (11.5%), infected cysts 19 (9.5%), urinary tract infections10 (5%), diabetic foot 9 (4.5%) respectively.

DISCUSSION

In this study the demographic profile showed the predominant age group of this study was 21-40 years (74.1%), which was similar to the study, conducted in Assam, India 21-40 years age group (53%), (Bhagawati, Kakati and Thakuria, 2017) [10] and Kolkata, India, where predominant age group was 25-30 years (Manab *et al*., 2017). The reason of this finding may be the younger patients are more concerned about illness. [11]

The highest income range of this study was ≤20,000Tk (76.7%), which is may indicate the low economic group of people who mainly visited the Govt. hospitals. The patients attended in outpatient department of DMCH were mostly educated by primary (29.1%) followed by below SSC (23.6%). The reasons of this educational status may be poverty and lack of social awareness of our population.

In this study 86% prescribed antibiotics were in oral formulation as a single route in OPD of surgery, medicine and gynaecology department. This was similar to Manab, *et al*., 2017, Kumar, *et al*., 2010 where prescribed oral formulation of antibiotics were 98% and 94.94% respectively. [11, 12]

In this study, 97% prescriptions were prescribed as an empirical therapy. Similar findings were found to a study done by Ahmed, *et al*., 2015, where empirical therapy in tertiary health care center was 93.5%. [13]

The most common disease in the current study for which antibiotics were prescribed in Medicine OPD predominantly was respiratory tract infection (RTI) (57.5%) which was similar to a study done by Laizu, *et al*.,2018 where respiratory tract infection (RTI) (32%) was most common indications. This was also found by Ahmed, *et al*., 2015.[13]

In Gynaecology OPD most common indication of antibiotic prescription was pelvic inflammatory disease (41.5%) which was similar to a study done in Eastern India by Manab, *et al*., 2017 where most common prescribed disease was pelvic inflammatory disease (41.4%).[11] Pelvic inflammatory disease is most common prevalent disease in subcontinent. Almost of all antibiotics were prescribed without doing any culture and sensitivity.

In this study there were 39.2% encounters containing inappropriate choice of first antibiotic therapy (neither used preferred or alternative antibiotics). A study conducted in Indonesia where inappropriate selection of antibiotic 22.7% (Andrajati, *et al*., 2016) as like as this study. [14]

The adherence to guideline was 67.5% in current study. Similar findings were found to a study done by sultana, *et al*., 2015 in BSMMU that there more than 80 percent was adherent to BSMMU guideline. These rational uses of antibiotics decrease antibiotics resistance. The study also urges the physician to be more professional and careful when antibiotic is prescribed for the outpatients.

LIMITATIONS OF THE STUDY
This study had the following limitations:
1) Rationality of antibiotic use was not assessed in this study due to lack of national antibiotic guideline.
2) The adverse antibiotic reactions could not be collected due to limited time frame.
3) This study was done in a tertiary care hospital having well communication; however, conditions might be worse in the remote corners of Bangladesh.

RECOMMENDATIONS
The following recommendations are forwarded in regard to this study:
1) Use of antibiotic therapy should be evidence–based.
2) Educational awareness program can be arranged and further monitoring of antibiotic utilization pattern can be carried out to assess the improvement of the intervention.
3) Formulation of national antibiotic guideline or institutional antibiotic guideline.
4) Formulation of Hospital Antibiotic Policy in order to subdue the multidrug resistant organisms.

CONCLUSION
From this study we can conclude that disease burden of Bangladesh is moving from communicable to non-communicable diseases the major causes of morbidity and mortality in our country are infective diseases and therefore antibiotics are the most widely used group of medicine.

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