## Prescription Pattern of Antibiotics among specialist doctors in Mymensingh city of Bangladesh

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#### Abstract

Antibiotics prescribing by physicians have gained due importance across the globe, mainly because of an increase in antibiotic usage, prevalence of infections and drug resistances. A survey on prescribing pattern of antibiotics was done for a period of 1 month in the different area of the city Mymensingh of Bangladesh. The study was designed to observe the adherence of the prescribing practices of antibiotics among different specialist doctors. A total of 200 prescriptions were collected and analyzed during the study period. It is evident from the study, 68% of the prescriptions contained antibiotics. Cefuroxine is found to be the most preferred antibiotics in physician's prescriptions. Specialized doctors in Medicines (48.6%) and Dermatology (11.1%) prescribed antibiotics mostly. Interestingly, Dermatologist (88.24%) is in top position and Orthopedicians (78.57%) are in the next to prescribe antibiotics in their own specialized field. Importantly, among different pharmaceutical companies, square pharmaceutical limited is in the highest position in selling antibiotics. From the research, it is observed that physicians prescribed antibiotics inappropriately and without following standard guidelines which will lead to the spread of bacterial resistance to antibiotics and related health problems. Therefore, a strict enforcement and adherence to existing regulations regarding antibiotic practices in Mymensingh city as well as in Bangladesh is needed immediately.

Keywords: Antibiotics, Bacterial Resistance, Prescription Pattern, Mymensingh City

### **1. Introduction**

Bangladesh is one of the most densely populated countries in the world. It is a unitary state and parliamentary democracy. Health and education levels are relatively low; although they have improved recently as poverty (31% at 2010) levels have decreased (en.wikepedia.org). According to the latest Bangladesh National Health Accounts, Bangladesh spends US\$ 2.3 billion on health or US\$ 16.20 per person per year, of which 64% comes through out-of-pocket payments. While, according to WHO estimates, Bangladesh currently spends US\$ 26.60 per person on health per year. Public funding for health is the main prepayment mechanism with scope for risk pooling, which constitutes 26% of total health expenditure. The other major funding source is international development partners. Chronic under spending of the Ministry of Health and Family Welfare's budget indicates inefficiency in utilization of resources as observed in the public sector review of the health sector.

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Antibiotics are a group of medicines that are used to treat infections caused by germs (bacteria and certain parasites). A parasite is a type of germ that needs to live on or in another living being (host). Antibiotics are sometimes called antibacterial or antimicrobials (Skold, 2011). Antibiotics can be taken by mouth as liquids, tablets, or capsules or they can be given by injection. Usually, people who need to have an antibiotic by injection are in hospital because they have a severe infection. Antibiotics are also available as creams, ointments, or lotions to apply to the skin to treat certain skin infections (Antibiotic Guideline, 2015-16). The use of antibiotics has given us medical control of bacterial infections. This is a health standard that we have become accustomed to and have come to regard as self-evident. Today, it is impossible to imagine health care that is not able to cope efficiently with bacterial infections (Skold, 2011).

Our ubiquitous use of antibiotics for medical purposes and for growth promotion in farm animals has been a toxic shock to the microbial world, which has responded by developing resistance (Skold, 2011). Antibiotic-resistant bacteria are germs that are not killed by commonly used antibiotics. When bacteria are exposed to the same antibiotics over and over, the bacteria can change and are no longer affected by the drug (Levy, 2002). There is a clear relationship between the amount of a given antibiotic used and the event of bacterial resistance (Wolff, 1993). Resistance to commonly used antimicrobial drugs is remarkably high in countries where antibiotics are not restricted (O'Brien, 1992). This is a major public health concern worldwide, especially in developing countries where higher rates of resistant bacterial infections persist (Okeke et al., 2007; Ojo et al., 2008). Antibiotic resistance in developing countries causes a catastrophic increase in the medical and socio economic burden of untreatable infectious diseases (Van Duong et al., 1997). The antibiotic prescribing rate of physicians is increasing day by day. They give antibiotics to the patients for various reasons pleasing the patients. Patients can get antibiotics easily from pharmacies without prescription. So, misuse of antibiotics is increasing.

The problem is too much in the rural areas of Bangladesh (Fagbule *et al.*, 1995). Over prescribing and inappropriate prescribing are very common in the country due to unethical practices of both health professionals and drug manufacturers (Dong *et al.*, 1999; Green halgh, 1987; Hardon, 1987). Studies carried out in Bangladesh, India,

Thailand and Tanzania estimate that 24% to 50% of the total pharmaceutical budget is spent on antimicrobial agents (Hossain *et al.*, 1982; Gustafsson *et al.*, 1981; Ratanawijitasin, 1996). Antibiotic sales without medical prescriptions have been observed in many countries (Abdulhak *et al.*, 2011). A high proportion of patients in some developing countries are treated by untrained practitioners simultaneously with oral and inject able antibiotics administered with contaminated needles and syringes. There is already enough evidence of growing resistance to antimicrobials in Bangladesh resulting from misuse of antibiotics (Dore *et al.*, 1997; Fedorak *et al.*, 1997; Nahar *et al.*, 2004). This exacerbates the existing problem of inappropriate use of antibiotics that leads to an increase in treatment cost, drug adverse effects, and antibiotic resistance among bacteria (Abdulhak *et al.*, 2011).

The aim of this study is to determine the amount of antibiotics prescribed by specialist doctors in Mymensingh city of Bangladesh.

### 2. Materials and Methods

A survey on prescribing pattern of antibiotics was done for a period of 1 month from July 01, 2017 to July 30, 2017 in Mymensingh city. A total of 200 prescriptions were collected from different hospitals and pharmacies during the study period. Simple statistical method (Bar diagram, pie chart, frequency distribution) was used to calculate, present the data and finally expressed in percentages. Microsoft office Excel and R mostly used to calculate and present data.

### 3. Result and Discussion

A survey study was designed to observe the antibiotics prescription pattern among the specialist doctors in Mymensingh city of Bangladesh. The most prospective general and specialized governmental and private hospitals were covered. A total of 200 prescriptions were randomly collected and the numbers of prescription contained antibiotics in different specialist are shown in table:

## 3.1 Percentage of the prescription containing Antibiotic

Name of the drug	Total no of prescription	Antibiotic containing Prescription	Percentage of antibiotics containing prescription (%)
Antibiotic	200	136	68%

Table 1. The table of the percentage of Antibiotic containing Prescription

The survey shows, 136 prescriptions out of 200 contain Antibiotics and the percentage of antibiotics containing prescriptions is 68% which indicate the use of antibiotics in Mymensingh city as well as in Bangladesh is quite high.

### 3.2 Prescription distribution in different specialist

Different section of prescription	Prescription number	Total prescription
Medicine	90	
Pediatrics	26	
Orthopedics	14	
Gastro liver	17	200
Gynecology	20	
ENT	16	
Dermatology	17	

**Table 2.** The table of the Prescription distribution in different specialist

Among the collected 200 prescriptions, Doctors specialized in medicines in highest position with 90 prescriptions, Pediatrics in second with 26 and then Gynecology, Dermatology, Gastro liver, ENT and Orthopedics with 20, 17, 17, 16 and 14 prescriptions respectively.

# **3.3** Percentage of prescribed antibiotics of specialist among all Antibiotic containing prescriptions

Name of Different Specialist	No of the antibiotic Containing prescription ( n=136)	Percentages of prescribed antibiotics (%)
Medicine	66	48.6
Orthopedics	11	8.1
Gynecology	14	10.3
Pediatrics	10	8.1
Gastro-liver	9	6.7
Dermatology	16	11.1
ENT	10	7.4

**Table 3.** Percentage of different specialist among all Antibiotic containing prescription

The TABLE describes the percentage of antibiotic containing prescription in each specialized doctor. Medicine accommodates the highest area with 48.6% and Dermatologist in second position with 11.1% and then Gynecologist.



### 1.4 The chart of only Antibiotic containing prescription

Figure: 3.1. Percentage of different specialist among all Antibiotic containing prescription

## 3.5: Percentage of Antibiotics prescribed among their own specialty

Table 4. The table of the percentage of Antibiotics prescribed among their own specialty

Specialist name	Number of prescription	Percentage (%)
Medicine	66 (out of 90)	73.33%
Orthopedics	11( out of 14)	78.57%
Gynecology	14( out of 17)	70%
Dermatology	16( out of 17)	88.24%
Gastro-liver	9 ( out of 20)	52.94%
pediatric	10( out of 20)	42.31%
ENT	10 (out of 16)	62.5%



Figure 3.2. Percentage (%) of Antibiotics prescribed among their own specialty.

The TABLE and Fig shows that Dermatology specialists prescribed highest amount of Antibiotics with a percentage of 88.24 and with 78.57%, Orthopedicians are in the next highest position.

## 3.6: Percentage (%) of different generic of Antibiotic

Generic name	Percentage (%)
Of Antibiotic	
Ciprofloxacin	20
Cefuroxime	22
Metronidazole	19
Azithromycin	8
Cefixime	26
Erythromycin	7
Amoxicillin	5
Others	1

Table 5. The table of the Percentage (%) of different generic of Antibiotic



Figure 3.3. Percentage of different generic of Antibiotics

The above Fig of the generic Antibiotics shows that the cefixime (26%) prescribed by most of the specialist doctors.

From the above graphical representation of percentage of the share of antibiotics among the different pharmaceutical company in the prescriptions we have collected, Square pharmaceutical limited has largest share of antibiotic sell with a percentage of 24.87. With a percentage of 19.97, Incepta pharmaceuticals accommodates second highest share in the market.

## 3.7: Share of antibiotics among the different pharmaceutical company

Table 6: The table of Share of antibiotics among the different pharmaceutical company

Pharmaceutical company	Percentage (%)
Square pharmaceuticals Ltd.	24.87
Incepta pharmaceuticals Ltd.	19.97
Beximco pharmaceuticals Ltd.	19.32
Opsoninpharma Ltd.	12.76
Renata Limited	9.03
ACI Ltd.	4.38
Eskayef Bangladesh Ltd.	3.22
Healthcare pharmaceuticals Ltd.	3.61
Drug international Ltd.	1.68
Popular pharmaceuticals Ltd.	0.65
Aristopharma Limited	0.51





### 4. Conclusion

From the survey it is evident that percentage of prescriptions contained antibiotics is relatively high (68%) and now it's time to justify whether antibiotics are properly used or misused. Cefuroxine is found to 88.24%) and Orthopedicians (78.57%), are in the next highest position in their own field. Importantly, among different pharmaceutical companies, square pharmaceutical limited (24.87%) is in the highest position in selling antibiotics. From this research, it is observed that physicians prescribed antibiotics recklessly. Inappropriate use of antibiotics may play a major role in the development and spread of antibiotics resistant bacteria. This is an alarming condition in the health sector of Bangladesh and therefore, the respective authority should take necessary steps to minimize the harmful effects of antibiotics. Therefore, there is a need of strict enforcement and adherence to existing regulations regarding antibiotic practices in Mymensingh city as well as in Bangladesh. Moreover, public awareness about the worldwide existing problems of antibiotic resistance should be increased, drug adverse effects should be implemented and physician should also precautions during prescribing antibiotics. Medicines accommodate the highest position (45.61%) and then the Dermatology (11.47%). Dermatology specialists prescribed highest amount of Antibiotics.

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