

Original Article

ANTIBIOTICS PRESCRIPTION PATTERN IN RURAL AREA OF BANGLADESH: A CROSS-SECTIONAL STUDY IN DEBIDWAR UPAZILA OF COMILLA DISTRICT

UMME SALMA KHANAM, KAZI NURUDDIN AL MASUD, TAHMID KHURSHED, UTSHA CHAKMA

Department of Pharmacy, BRAC University, Dhaka, Bangladesh
Email: khamamumesalma@gmail.com

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ABSTRACT

Objective: The study was aimed to evaluate the antibiotic prescription pattern by physicians in the area of study.

Methods: This cross-sectional observational study was carried out with a self-designed standard questionnaire by manual data collection over a three months period at the Debidwar Upazila of Comilla District. The data were collected by directly interviewing the participants. Microsoft Excel 2010 was used for the analysis of the collected data.

Results: Out of 242 patients, 60.74% of patients were male, 39.26% of patients were female. Majority of the patients (50%) belonged to age group 9 to 20 and in terms of profession, 53.30% were students. Among the previous disease history, hypertension (20.25%) was found at the dominant position. Common cold (28.95%) was the frequent reason for visiting doctor and ciprofloxacin was prescribed to 30.17% patients (Male: 21.90%, Female: 8.26%). Before prescribing anti-bacterial agents or any other agents, only 23.55% patients were recommended diagnostic tests and in 81.81% cases, physicians simply prescribed medicine by his/her own assumption and culture and sensitivity test was recommended and done for 18.18% patients.

Conclusion: Prescription of broad-spectrum antibiotics for common cold and diarrhea, prescribing antibiotics or medicine based on presumption was the clear indications of irrational antibiotics use and inappropriate prescription pattern.

Keywords: Antibiotics, Prescription pattern, Diagnostic tests, Culture, and sensitivity test

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INTRODUCTION

Sir Alexander Fleming discovered penicillin in 1928 which was the commencement of antibiotic revolution and brought drastic changes in the field of modern medicine. Antibiotics proved its effectiveness in prolonging the life expectancy [1], and it is one of the most frequently used, costly medication categories, but the inexact use of antibiotics often leads to resistance towards infections. For the last two decades, antibiotics resistance has turned into a burning issue in the public health sector, due to the increment of multi-drug resistance and the limited availability of new drugs [2]. Reasons could be the demand of antibiotic treatment to satisfy patients and not having enough understanding about the incompetence of antibiotics about viral illness, and unrestrained availability of antibiotics are leading factors [3]. According to the world health organization (WHO), one of the biggest threats to the health of human is resistance to the antibiotics. A major concern in public health is the rise of antimicrobial resistance (AMR). In spite of being non-preventive, the prevalence of this problem can be reduced [4]. A matter of catastrophe is that this is a worldwide problem that is increasing with every passing day [4-7]. Antimicrobial resistance leads to an increase in morbidity and mortality, cost of health care. Eventually, the rate of successful treatment decreases with time. There are several influential factors that subsist when prescribing the antibiotics. Unnecessary and excessive antibiotic prescribing, lack of information, inappropriate route of administration or dosage, prescribing antibiotics for non-bacterial infections and last but not the least self-prescribing, are some notable factors [8]. However, the most vital recognized factor is the infelicitous prescribing of antibiotics by the practitioners [9-12].

Before prescribing medicine, carrying out the diagnostic test is important. Through diagnostic tests, long-term complications can be avoided, and the effectiveness of treatment can be improved, transmission of diseases can be prevented, and most importantly, the misuse or overuse of antibiotics can be reduced [13]. The

primary aim of our study was to evaluate the prescription pattern of antibiotics by the physicians in a rural area. The study measured patients' socio-demographic profile, the reason for visiting doctor, infections' duration and the prescription pattern of antibiotics.

METHODS AND MATERIALS

Study design

This was a cross-sectional observational study. This study was carried out amongst the households of a particular area of Debidwar Upazila. The prescription pattern was observed in that particular area through the development of a self-designed standard questionnaire. The study was carried out over a three month period. The sample size was 242.

Study site

The study was conducted among the residents of Debidwar Upazila of Comilla District in the Division of Comilla, Bangladesh. Debidwar is located at 23°36'00"N 90°59'30"E and has an area of the 238.36-kilometer square (km²). Debidwar has now become a Pourashava. Being a pourashava, Debidwar has 16 Unions, 143 Mauzas/Mahallas, and 201 Villages.

It has 55619 units of the household. There are many notable water bodies present in this Upazila. Among them, the main rivers are Gumti and Buri. According to the Bangladesh Population Census 2001, Debidwar has a population of 378401, of whom more than 158,356 are aged 18 or older. In this pourashava, 50.33% of the population is constituted by the males and 49.67% females. The average literacy rate of Debidwar is 50.39% (7+years) among which male 54.51%, female 46.28%, against the national average of 47.5%. The town has a population of 9782, among which 52.32% are male, and 47.68% are female; population density is 2264 per km². 56.9% people of the town are literate [14].

Data collection

The interested residents of the targeted area shared their living conditions, educational status, food habit, sanitation practice, family history of infectious diseases and their medical history. The participants were not pressurized for sharing any data which they were not comfortable with. The questions were in English which were translated into Bengali for the participants who did not understand English by the data collector.

Data analysis

Analysis of the collected data was done by Microsoft Excel 2010 and data were presented graphically in percentages (%).

RESULTS

Out of 242 patients, 60.74% patients were male, 39.26% patients were the female and marital status of 47.10% was married. Majority of the patients (50%) belonged to age group 9 to 20, and in terms of profession, 53.30% were students.

Only, 8.26% patients were illiterate and of 53.30% patients were living in kutcha or temporary house. Detailed patients' socio-demographic profile is enlisted in fig. 1. In the study, we found that all the patients had a family history of the infectious disease (Male: 60.74%, Female: 39.25%) but it does not mean the family history of infections are solely responsible for having an infectious disease.

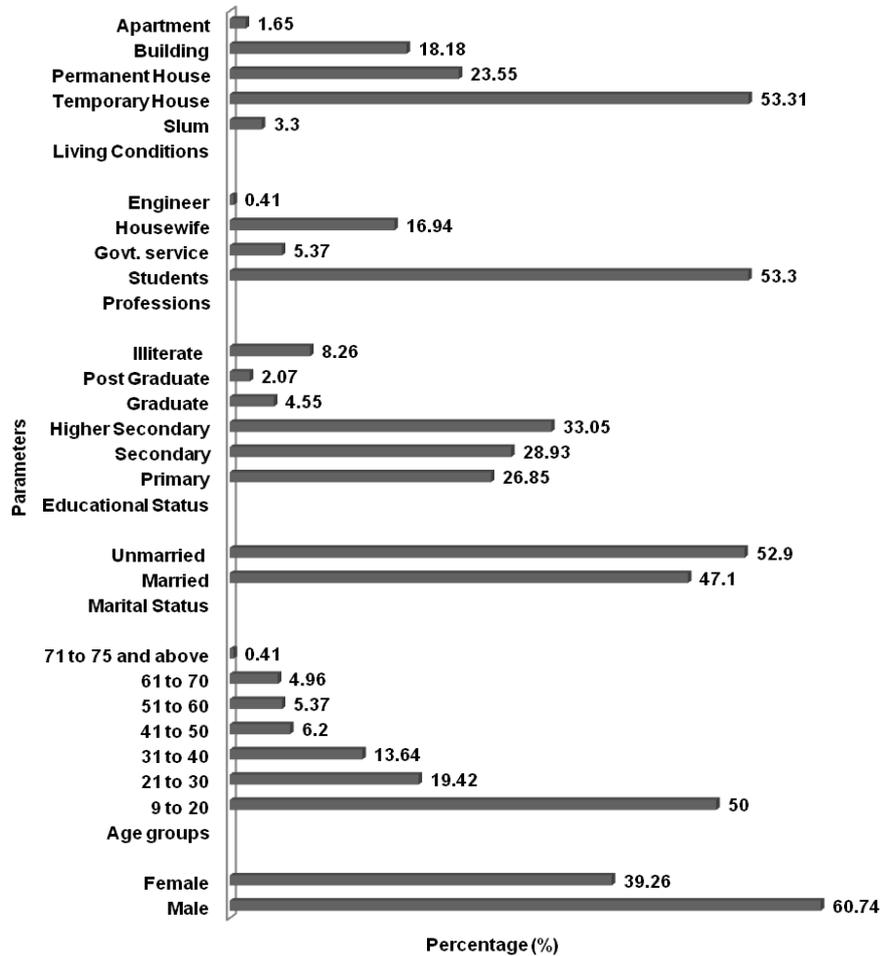


Fig. 1: Socio-demographic profile of 242 participants of the study showed in percentage (%)

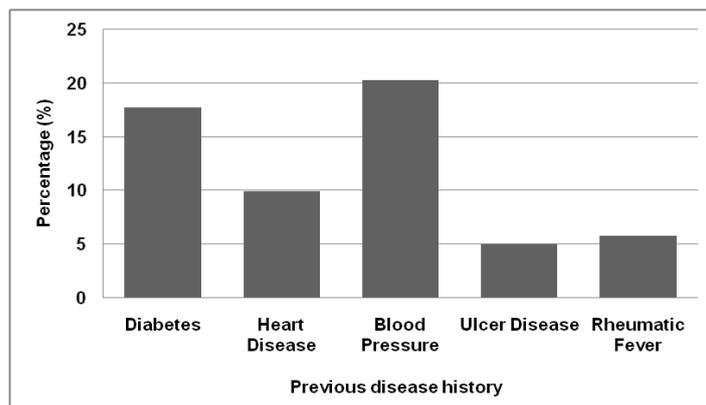


Fig. 2: Percentage of patients in terms of previous disease history

In this study, 20.25% patients had a previous history of hypertension, 17.77% patients had diabetes, 9.92% had heart disease, 5.79% had heart disease and 4.96 % patients had a history of peptic ulcer which has been shown in fig. 2. Most common reasons for taking a prescription for antibiotics from the doctor

were common cold (28.95%) and tonsil (12.40%). The less common complaint was about skin infection (2.89%), and details were shown in fig. 3. In addition, 63.64% of patients were suffering from infections for one week, and 8.25% patients were suffering from two weeks (fig. 4).

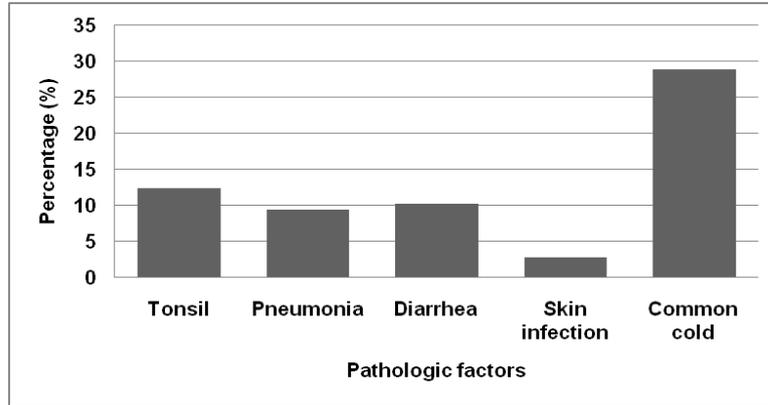


Fig. 3: Reasons for visiting doctors

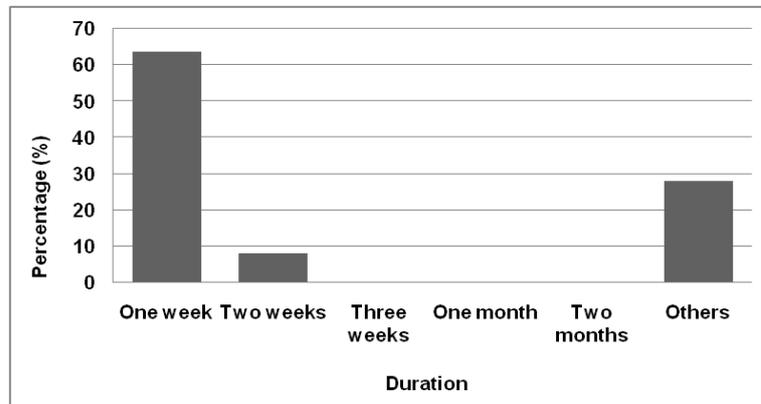


Fig. 4: Duration of suffering from an infection

In terms of prescription pattern of physicians, it was found that 16.44% patients were prescribed ampicillin (Male: 10.33%, Female: 6.11%), 30.17% ciprofloxacin (Male: 21.90% Female: 8.26%) and less commonly, tetracycline was prescribed to 1.64% patients (Male: 1.23%, Female: 0.41%) which have been shown in fig. 5 and 91.32% patients

completed courses of antibiotics. Before prescribing anti-bacterial agents or any other agents, only 23.55% patients were recommended the diagnostic test, and in 81.81% cases, physicians prescribed medicine based on their presumption. Moreover, culture and sensitivity test was done for 18.18% of patients before prescribing medication(s) (fig. 6).

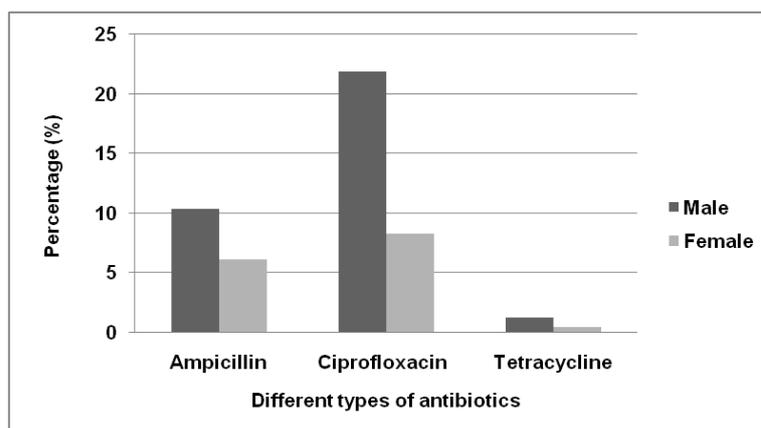


Fig. 5: Percentage of gender variability of antibiotics prescription

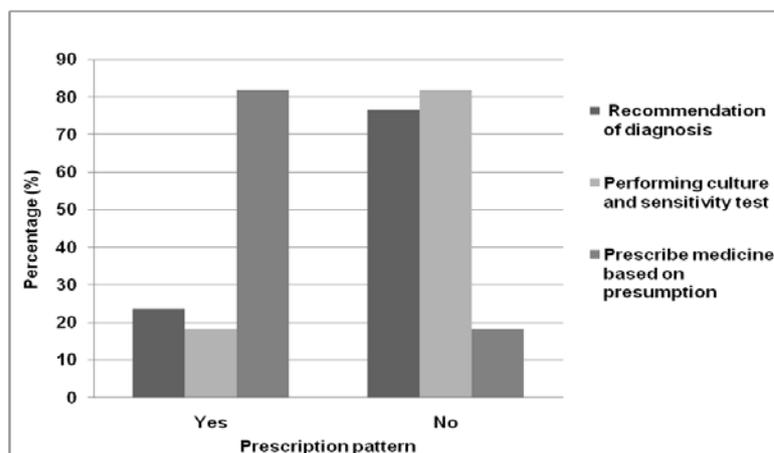


Fig. 6: Prescription patterns of physicians

DISCUSSION

Most of the study participants were students and belonged to age group 9-20, and they were prescribed antibiotics mostly. In our study, 48.35% of patients were prescribed different types of antibiotics including ampicillin, ciprofloxacin, and tetracycline from a total of 242 patients. Among them, 33.47% participants were males and rest of the participants were females. Similar findings were also observed in a number of studies conducted previously in Bangladesh, Nepal, and India [1, 15, 16]. This is not fully understood why males were prescribed more antibiotics than females but it could be due to dominance characters of male in Bangladesh which biased medical decision and had been shown in fig. 5 and for both male and female, most commonly prescribed antibiotics were ciprofloxacin and ampicillin (penicillin) and this finding partially matched with another study conducted in Aden, Yemen [17]. At the same time, it was also observed from fig. 3 and fig. 5 that most common diseases was common cold (28.95%) and most frequently prescribed antibiotic was ciprofloxacin (30.17%). Ciprofloxacin, a synthetic fluoroquinolone, and a broad-spectrum antibiotic would be considered as a first line treatment for those infections where the involvement of gram-negative pathogens are proved or strongly suspected like bacterial diarrhea, selected bone and joint infections, malignant otitis externa, urinary tract infections, bacterial prostatitis and so on [18]. Nevertheless, in this study, only 9.5% of patients were suffering from pneumonia; where ciprofloxacin was received by 30.17% patients. Danish guideline on prescribing antibiotics, national health service (NHS) guideline with the Rotherham Foundation Trust referred to use of narrow-spectrum antibiotics where possible [19, 20] but our practitioners most commonly prescribed broad-spectrum antibiotics for conditions like common cold, diarrhea, skin infection etc. which led to antibiotic resistance. Moreover, some descriptive study cited about WHO and other strong guidelines where antibiotics are not recommended for an illness like cold, diarrhea [1, 21].

In this study, culture and sensitivity test was recommended and done only for 18.18% patients; before taking antibiotics or medicine(s). Rest of the 81.82% patients was not recommended to perform any culture and sensitive test. A similar result was also observed in another study of 2015, conducted in different units of Dhaka medical college hospital, Dhaka, Bangladesh [22]. Though a number of guidelines like NHS guideline for antimicrobial protocol for the management of infection in primary care 2017-2019 and Hertfordshire partnership university NHS foundation trust guideline for antimicrobial prescribing guidelines in adults 2015 stated that clinical and diagnostic tests must be carried out before prescribing antibiotics to ensure that bacteria are responsible for the illness and prescribed antibiotics are beneficial for the illness. These guidelines also mentioned not to prescribe antibiotics for viral infections like a common cold. In addition, microbiological testing like culture and sensitivity test must be carried out before prescribing antibiotic

treatment to check hypersensitivity and allergic reaction [20, 23] but it was found that only 18.18% patients were recommended culture and sensitivity test, 23.55% patients were recommended diagnostic test before prescribing antibiotics, and in 81.81% cases, physicians reach to any conclusion of prescribing medicine based on their presumption as shown in fig. 6.

CONCLUSION

This study was conducted in a rural area, where most of the patients belonged to age group 9 to 20, and they received the greater portion of antibiotics. Most frequently, patients received broad-spectrum antibiotics for normal infectious disease like common cold and no clinical test or culture sensitivity test was referred. More than 80% of patients received medications based on prescribers' presumption of disease. All the variables clearly reflected the misuse of antibiotics, as well as physicians' infelicitous prescription pattern.

ABBREVIATIONS

AMR = Antimicrobial resistance, E = East, N = North, NHS = National Health Service, WHO = World health organization

LIMITATION OF THE STUDY

The study was conducted in a rural area where numerous numbers of peoples did not want to participate in the study. As a result, we could not collect a large sample size which could increase our work significance.

AUTHORS CONTRIBUTIONS

Al Masud designed and conceived the study. Khanam analyzed, interpreted the data and drafted and revised the article while Khurshed and Chakma participated in data collection and article revision.

CONFLICT OF INTERESTS

The authors proclaim that they have no conflicts of interest

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