Pattern of Use of Antibiotic at Community Level in Under 5 Years of Age: A Descriptive Type of Cross Sectional Study

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Abstract

Background: Antibiotic resistance is becoming a great problem/major threat worldwide regarding/contributing disease mortality and morbidity. In our country reveled that prevalence of antibiotic resistance for most common organism is quite high and many of the common first-line drugs were mostly ineffective. Though antibiotic resistance may occur naturally over time due to genetic mutation but misuse and overuse of antibiotics plays a great role for emergence of resistance. The objective of the study to find out the pattern of use of antibiotic at community level by different level of physician.

Materials and methods: The study was designed as a descriptive type of study conducted in the Outpatient Department of Chattagram Maa Shishu O General Hospital, a tertiary care hospital from 1st September 2022 January – 28th February 2023.The study population was 350 patients age from 29th days to 5 years who receive antibiotic at community level.

Results: A total of 350 children of 29 days to 5 years of both sexes who prescribed antibiotic at community were enrolled in this study. Within the study group , 56% cases antibiotic advised by MBBS doctor rest are by nonregistered doctor and 38% patient took antibiotic in inadequate dosage and duration. 62% patient prescribed antibiotic without investigation. Most commonly prescribed antibiotic was Cefixime and most common disease Symptoms is fever and cough, cough and running nose.

Conclusion: The common cause of antibiotic resistance is use without indication, inappropriate dosage and duration. At community level most of the physician does not follow the antibiotic guide line. So Govt. and health professional should take proper step to create awareness about antibiotic resistance.

Key words: Antibiotic resistance; Children; Community level; Use of antibiotic.

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Submitted on : 05.04.2023
Accepted on : 19.06.2023

Introduction

Antibiotic are essential for treating infection, disease cure as well as for our life. The development of antibiotics into clinical use was arguably the greatest medical breakthrough of the 20th century.[1,2] But inappropriate and overuse of antibiotics may result in emergence of antibiotic resistance and thereby treatment failure. Now a day antibiotic resistance is becoming a great problem/major threat worldwide regarding/ contributing disease mortality and morbidity. WHO has declared that antimicrobials resistance is one of the top 10 global public health threats facing humanity.[3] The report shows that above 50% of resistance were reported in bacterial causing blood stream infections. Mostly Low and Middle Income Countries (LMICs) are more likely to report significantly higher antimicrobial resistance.[3] In general practice it has been shown in a study that 80% of all human antibiotic prescribing occurs in the community and between 5–50% of all antibiotics were considered inappropriate.[4,5] In our country, in community level most common bacterial infections are RTI, UTI, diarrhea, enteric fever, sepsis etc for whose antibiotics are frequently prescribed. A systemic review in our country reveled that prevalence of antibiotic resistance for most common organism is quite high and many of the common first-line drugs were mostly ineffective.[6]

Though antibiotic resistance may occur naturally over time due to genetic mutation but misuse and overuse of antibiotics plays a great role for emergence of resistance.[7,8] Besides, lack of clean water and sanitation, inadequate infection prevention also contributes to this.[9] Despite warnings regarding overuse, antibiotics are overprescribed.[10] Health care provider prescribe antibiotics when it is actually not justified in cases like viral infection or yet undiagnosed cases. They

may choose inappropriate antibiotic prescribe inappropriate antibiotic when specific antibiotic for the disease he diagnosed is available due to lack of knowledge. Sometimes they prescribe antibiotic with incorrect dose and duration. In many countries, antibiotics use are unregulated and available without a prescription.[10,11] Lack of regulation on antibiotic use results in easy accessibility of antibiotics that promote overuse.[12] Antibiotics misuse are very common in our country also, even self-medication of antibiotics are quite common.[12,13]

This study was conducted at Pediatric ward and OPD of Chattogram Maa Shishu-O-General Hospital, Chattogram from 1st September 2022 January-28th February 2023 to assess the antibiotic use behavior of doctors of different level at community level.

Materials and methods

The study was designed as a descriptive type of study conducted in the Outpatient Department of Chattagram Maa Shishu O General Hospital, a tertiary care hospital from 1st September 2022 January-28th February 2023.The study population was 350 patients.

Inclusion criteria

- Patient of 29 days to 5 years of age
- Patient received oral antibiotic.

Exclusion criteria

- Age less than 29 days and more than 5 years
- Patient referred from other hospital.

Detailed history was recorded in a questionnaire from the mother or other care giver after taking informed written consent. The collected data was analyzed by statistical software packages SPSS method version 22. Necessary permission was taken from the proper authorities before started the study.

Results

350 patients enrolled in our study that fulfills the inclusion criteria. Demographical data showed 73% patient came from urban area and 27% from rural area, about 61% are male and 39% female. Within the study group, 56% cases antibiotic advised by MBBS doctor and about 31 % took antibiotic according to advice of pharmacy owner.

Table I Prevalence of antibiotics given by visiting physicians

Antibiotics Name	Visiting MBBS	DMF	Physician Polly	Pharmacy Owner	Previous prescription	Own choice
Total (350)	196	28	14	106	2	4

About prevalence of antibiotic starting time, 62% patient starts antibiotic less than 3 days of onset of illness within which 46% by registered physician and 54% by others. 12% patient start after 5days from which 80% are MBBS doctor.

About doses and duration of antibiotic use – 62% patient took in proper dose and duration within which 82% advised by MBBS doctor. 38% took antibiotic in inappropriate dose and duration.

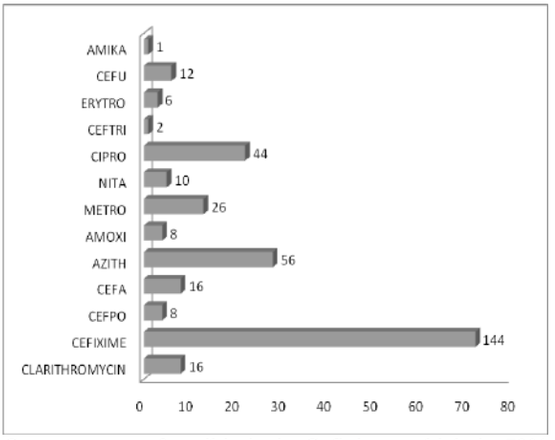
Table II Frequency of doses of antibiotics given by physicians

Physician	Dose Appropriate	Dose In appropriate	Chi square value	p value
MBBS	180	16		
DMF	12	16		
Polly	2	12	88.81(app.)	0.000**
Pharmacy	20	86		
Previous prescription	2	0		
Own Choice	2	2		
Total	218	132		

** Indicate significant value of P at 5% level of significance.

About investigation, only 38% patient advised for investigation others are given emphatically.

Table III Common antibiotic prescribed by physician



Common use of antibiotic is Cefixime, which is 72% followed by Azithromycin (28%) and Ciprofloxacin (22%).

Disease or symptom for which antibiotic was commonly used are fever and cough (29%), Fever, cough and running nose (17%), fever (16%), cough and running nose (14%), acute watery diarrhea (13%).

Discussion

In the study population 61% patient are male and 39% are female. B.Mohitosh et al. also showed 22% more use of antibiotic in male then female.[13] Other study in Nepal by Shankar RP et al. also shows the male predominance in use of antibiotic.[14] This may be due to more attention to male child in our society or may be female baby are less expose to outside then male baby.

Within the study population 73% patient came from urban area and 27% from rural. This may be due to our center located in urban area.

Within the study group, 56% cases antibiotic advised by MBBS doctor and about 31 % took antibiotic according to advice of pharmacy owner. B. Mohitosh et al. also showed the most of the patient visit MBBS doctor at city area then rural.[13] This may be due to availability of MBBS doctor at urban area and increased consciousness of the care giver. On the other hand 31% patient took antibiotic advised by pharmacy owner which is alarming for the community. Community-based study in Indonesia showed that more than half of the antibiotics used were not prescribed.[15]

About prevalence of antibiotic starting time 62% patient start antibiotic less than 3 days of onset of illness within which 46% by registered physician and 54% by others. 12% patient start after 5 days from which 80% are MBBS doctor. There was a tendency to start early antibiotic mostly by non-registered physician may be due to ignorance about proper guideline about use of antibiotic or for financial benefit or aggressive marketing policy of pharmaceutical company encourage to prescribe antibiotic.

About doses and duration of antibiotic use – 62% patient took in proper dose and duration within which 82% advised by MBBS doctor. 38% took antibiotic in inappropriate dose and duration. A study also showed that about 22% patient receive either overdose or under dose.[16] In a study undertaken in Vietnam in 1997, researchers discovered that more than 70% of patients were prescribed with inadequate amounts of antimicrobials for serious infections[17].

Most of the patient who advised antibiotic by MBBS doctor is taken antibiotic in proper dose and duration but most of the unregistered physician and also some registered doctor prescribed antibiotic in wrong way. This may be due to ignorance about pediatric dose and duration which is different from adult.

About investigation, only 38% patient advised for investigation others are given emphatically. Another study also show that The physician prescribe maximum antibiotics (83%) for outpatients in Bangladesh without clinical test[17]. As Bangladesh is a developing country so economical cause and unavailability of investigation facility most of the physician try to treat the patient from their experience.

Common use of antibiotic is Cefixime, which is 72% followed by Azithromycin (28%) and Ciprofloxacin (22%). Although Bangladesh adopt WHO recognized IMCI where amoxicillin is the drug of choice, but in our study we have found different. This may be due to resistance of antimicrobial to amoxicillin and also may be due to business purpose of the pharmacy owner or marketing policy of pharmaceutical company as amoxicillin is available at govt. facility. Another study in Bangladesh also showed common use of drug in community level are cephalosporin (31.5%), macrolides (27.3%) and quinolones (16.33%).[1] One study in Pakistan Queishi S. et al also showed common use of drug in pediatric age group is cephalosporin (63.8%).[18] Adisa R. et al. at Nigeria also found more than one -half (58.4%) of the prescriptions reviewed from the case notes contained cephalosporin.[19] That is why antibiotic resistance is gradually increasing.

Disease or symptom for which antibiotic was commonly used are fever and cough (29%), Fever, cough and running nose (17%), fever (16%), cough and running nose (14%), acute watery diarrhea (13%). The Demographic and Health Survey of Indonesia conducted in 2012 has also shown that the prevalence of antibiotic use ranged from 12.5% for diarrhea to 39% for ARI.[15] Most of cases that attend in outpatient department fever cough and running nose who are suffering from mild symptom or seasonal flue where antibiotic may not be necessary. This may be due to lack of knowledge about use of antibiotic or unavailability of investigation facility or

economical cause. A previous study in low-middle-income countries also reported 44% of acute respiratory illness was treated with antibiotics.[20] From other study in Asian countries also showed that acute respiratory tract infection was the most common illness where antibiotics are use.[21-23]

According to WHO guideline antibiotic is not recommended in acute watery diarrhea but 13% patient in our study took antibiotic for acute watery diarrhea. Therefore most of antibiotic use in acute watery diarrhea and ARI might not be essential.

Limitation

- Small sample size.
- Short duration of study.

Conclusion

Now a day's antibiotic resistance is a burning issue. Proper indication and dosage is important to prevent antibiotic resistance. In our study we showed that non registered physician are prescribing antibiotics without indication and inadequate dosage and some registered doctor also inappropriately prescribed which is alarming. Government of Bangladesh should take steps to prevent the use of antibiotics other than registered physician and all registered doctor should follow the antibiotic guideline properly.

Recommendation

Further studies should be carried out involving large number of participants in multiple centers for actual picture.

Acknowlegement

The authors convey their thanks to all, who assisted them on this path.

Contribution of authors

RC-Conception, acquisition of data, drafting & final approval.
TB-Design, interpretation of data, critical revision & final approval.
FK- Acquistion of data, data analysis, drafting & final approval.
MM- Acquistion of data, data analysis, drafting & final approval.
MJBAC- Data analysis, interpretation of data, critical revision & final approval.
PC- Interpretation of data, critical revision & final approval.

Disclosure

All the authors declared no competing interest.

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