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Irrational and Excessive Use of Antibiotics in Children: A Survey on Parent's Knowledge, Practice and Attitudes in Bangladesh

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Research Article

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Abstract

Background and Aim: Antibiotic resistance is a term of global concern worldwide. Irrational and misuse of antibiotic is one of the key factors for this resistance. We aimed to analyze the attitude, knowledge and practices of antibiotics use among parents of children presenting to a tertiary care hospital in Bangladesh. Also, correlate it with the gender, education level and previous use of antibiotics by the parents.

Methodology: A cross sectional study was performed at a Shishu Hospital in Dhaka, Bangladesh from November 2017 to March 2018 and a total of 1200 parents were interviewed using a questionnaire developed by the authors. Statistics were used for the analysis of data.

Results and Discussion: A total of 1160 parents were included in the present study. Around 15.51% parents correctly identified that antibiotics are used against bacterial infections and only 17.25% parents of total participants knew the meaning of the term antibiotic resistance. Majority of the parents (70.68%) appreciated that misuse of antibiotics could harm the child. Around 67.79% parents mentioned that they don't use leftover antibiotics from the previous prescription for the next time without doctor's consult. Our observation was that misconceptions exist about the use and indications of antibiotics. Lack of knowledge about antibiotic resistance was prevalent. But participants were aware of the risks associated with misuse of antibiotics.

Conclusion: Pediatricians and involvement of mass media may help to improve the antibiotics knowledge and practices among parents and consequently, control the problem of antibiotic resistance.

Keywords: Paediatrics; Antibiotics resistance; Bacterial resistance; Antibiotic misuse

Introduction

Antibiotic is one of the greatest *discoveries* of *twentieth century*. Infectious disorders contributed to high morbidity and mortality worldwide before the invention of antibiotic. However this situation was short lived. Soon antibiotic resistance was the prime concern all over the world. Now a day, antibiotics are the most commonly sold drugs throughout the world. Misuse and excessive use of antibiotics for any and every condition has developed the antibiotic resistance [1].

In many developing nations like Bangladesh, there is not always an imposition to bring a valid prescription for buying the prescription only medicines. Antibiotics are irrationally used in many developing countries which results from widespread availability of these drugs, causing inappropriate use and ultimately resulting in steady increase in antibiotic resistance [2,3]. Misuse of antibiotic treatment potentially implies non-compliance with recommended and prescribed therapy. The concept of noncompliance involves practices including self-prescription, incomplete treatment, missing the doses, taking suboptimal doses and reuse of left over antibiotics. Antibiotic misuse is a worldwide problem and results in the rapid development of antibiotic resistance, increased healthcare cost, increased failure of treatment, frequent and prolonged hospitalization and so on [4].

Moreover, over the last two decade, there are poly-pharmacy practices in Bangladesh and frequently uses of antibiotics have become a common matter in this country [5]. Over prescribing of antibiotic drugs is a serious issue in Bangladesh and worldwide [6]. Misuse of antibiotics and antibiotic resistance (AR) are very closely related [7,8]. In developing countries we can get antibiotics from private retail pharmacies without prescription [9,10].

Hence, all these factors emphasize the need to investigate and tackle such unhealthy practices. In the present study, we aimed to analyze the attitude, knowledge and practice of antibiotic drugs used by the parents for their children and correlates it with the demographic characteristics. It may help in identifying the subgroups of population with high rates of antibiotic abuse and help in developing proper interventional programs to improve the public knowledge of antibiotics and hence, take a step towards controlling antibiotics resistance.

Methodology

A cross-sectional research work was performed at Shishu hospital in Dhaka, which is the largest children hospital in Bangladesh. This is a tertiary care public hospital with both outpatient and inpatient facilities. A total of 1160 parents who visited the Out Patient Department (OPD) of this hospital in the months of November 2017 to March 2018 were included in the study. The authors had reviewed other questionnaires in earlier studies and designed a short questionnaire. All the participants gave their opinion after describing them the nature and purpose of the study. Confidentiality was maintained when all the information were collected in unknown form.

All of the participants were given the option of having the questions read to them and their answers recorded by the researcher or they could read and answer the survey on their own. Both the options were provided to overcome any discomfort in respondents who may have literacy difficulties and also to increase the participation rate. The entire questionnaire was made available in both English and the local language, Bangla in a strategy to increase the participation rate.

The demographic data gathered included age, sex & education level as described in Table 1. Questionnaire was mainly prepared to assess three major categories:

- Knowledge related to objectives of antibiotics (Bacteria, parasites, virus or any microbe), use of antibiotics (fever, skin infection, cough, etc), side effects of antibiotics and antibiotic resistance.
- Attitude towards consumption of antibiotics like the need to use antibiotics in every ill child, frequency of antibiotics use in a year.
- Practice of antibiotics like use of left over antibiotics, completing the course of antibiotics.

Parameters	Knowledge of antibiotics	
	Yes	No
No. of Cases	1160	40
age of child (y)		
Mean	3.92	2.36
SD	2.72	2.3
Range	00.2 – 15.00 y	00.8 – 15.00 y
Sex (%)		
Male	460 (39.65)	13 (32.5)
Female	700 (60.34)	27 (67.5)
Education (%)		
upto High School	280 (24.14)	37 (92.5)
Graduate	760 (65.52)	3 (7.5)
Post graduate	120 (10.35)	

Table 1: Demographic details of participants.

Data was taken in MS Excel. Responses were analyzed using SPSS software. Descriptive and total statistics were used for the study. Categorical variables were compared using Chi-square test. 95% confidence interval and p-values were mentioned.

Only data from the parents who knew the term antibiotic was considered for the analysis. Those who had never heard antibiotics were not required to answer the questionnaire further. All of these cases were considered as missing values and not used in further analysis to avoid bias [8].

Results

Out of the total 1200 participants who were requested to fill the questionnaire properly, only 1160 knew the term antibiotic and hence the remaining 40 parents were excluded from the present study. Therefore, the participation rate is 96.66%. The demographic details of the participants have been explained in the (Table 1 & Figure 1). Out of the 1160 participants, more than 50% were females (60.341%). Education level was grouped as high school and below, graduate and then, postgraduate. 496 respondents (65.52%) were graduates, while the percentage of post graduates (10.35%) and up to High school level were 10.35 and 24.14 accordingly.

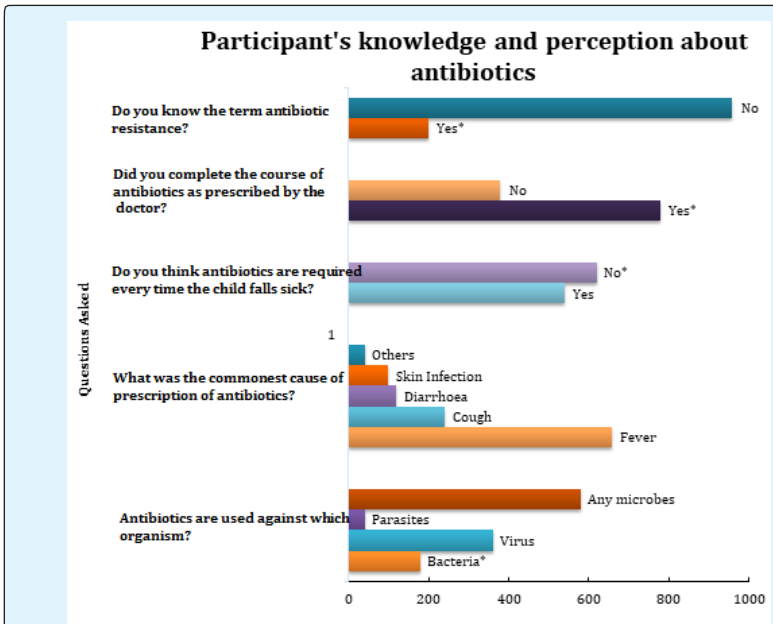

Figure 1: Participant's knowledge and perception about antibiotic.

Out of the total, 34.48% parents (95% CI: 31.75-37.22) agreed that their child was taken a course of antibiotics in the past. Concerning the reason of use of antibiotics, majority (56.89%, 95% CI: 54.05 - 59.75) of the parents supplied it to the child for fever, followed next by cough and cold (20.68%, 95% CI: 18.36 -23.02). All the reasons of antibiotics use with their frequencies have been shown in the Table 2.

Statement	Number	Percentage (%)	95% CI
Antibiotics are used against which organism?			
Bacteria*	180	15.51	13.44 -17.60
Virus	360	31.03	28.38 -33.70
Parasites	40	3.44	2.40 - 4.50
Any microbes	580	50	47.13- 52.88
Did your child receive antibiotics in the past one year?			
Yes*	400	34.48	31.75 - 37.22
No	760	65.51	62.78-68.25
What was the commonest cause of prescription of antibiotics?			
Fever	660	56.89	54.05 - 59.75
Cough	240	20.68	18.36 -23.02
Diarrhoea	120	10.34	8.59-12.10
Skin Infection	100	8.62	7.01 - 10.24
Others	40	3.44	2.40 - 4.50
Do you think antibiotics are required every time the child falls sick?			
Yes	540	46.55	43.68 - 49.42
No*	620	53.44	50.58 -56.32
Did you complete the course of antibiotics as prescribed by the doctor?			
Yes*	780	67.24	64.54-69.94
No	380	32.72	30.06 -35.46
Do you think use of antibiotics can harm the child?			
Yes*	820	70.68	68.07- 73.31
No	340	29.31	26.69- 31.93
Have you ever used left over antibiotics from previous prescription for the child?			
Yes	360	31.03	28.37-33.70
No*	800	67.79	66.30-71.63
Do you know the term antibiotic resistance?			
Yes*	200	17.25	15.07 - 19.42
No	960	82.75	84.93-80.58

Table 2: Participant's knowledge and perception about antibiotic.

Most of the respondents were confused regarding the indication of antibiotics use. This study found that only 180 parents (15.51%; 95% CI: 13.44 -17.60) were known that antibiotics are used against bacterial infection, while 360 parents (31.03%; 95% CI: 28.38 -33.70) wrongly thought that they are used against viruses and 580 parents (50%; 95% CI: 47.13- 52.88) thought that antibiotics could be used for any microorganism. Moreover, only 200 respondents (17.25%; 95% CI: 15.07 - 19.42) have the idea about antibiotic resistance (Table 2 & Figure 1). Almost one third (29.31%; 95% CI: 26.69- 31.93) parents felt that antibiotics don't have any harm one excessive use [Table: 2, Fig-1]. Out of the total participants, 67.24% (95% CI: 64.54-69.94) of the parents replied that they completed the course of antibiotics as prescribed by the doctor, While 67.79% (95% CI: 66.30-71.63) parents agree that they never used leftover antibiotics from the previous prescription for their child.

Discussion

Societies play a significant role in use and misuse of antibiotics as well as the spread of uncritical tendencies [11]. Bangladesh is a place of the higher number of infectious disorders, the use of antibiotic drugs is widespread. But because of the laws are relaxed in Bangladesh and other developing countries, so that antibiotics are available without prescription (over the counter drugs) and hence, misuse of antibiotics by mass people is common. Many studies have compared differences in rural and urban population for antibiotic prescribing patterns [12,13]. While Yao, et al. [12] performed a study in China to find rural urban disparities and reported that prescribing patterns were higher in urban areas, Godycki Cwirko, et al. [13] conducted a similar study in Poland and reported that there wasn't much difference in antibiotics knowledge among people despite the difference in education levels [13,14]. These findings were consistent with similar studies done in other countries like Greece where parents considered excessive antibiotics use could lead to antibiotics resistance [15-17]. In our study geographical location didn't use as a comparison factor since it has been taken at a single hospital, but education is used as a variable for comparison. Being aware of the knowledge, attitude, and practices concerning antibiotics among parents may aid in more effective communication between the doctor and patients, thus promoting the development of policies to educate the public [13,14].

It was observed in this study that most of the people were confused about the use of antibiotics for either bacterial or viral infection because only 15.53% knew that they were used for bacterial infection. Majority of people (50.00%) thought that antibiotics are used for any microbial infection. This may be attributed to the reason that while counseling, doctors use the general term 'germs' for indication of antibiotics, rather than specifically mentioning bacteria [14,15]. Also, as mentioned by Rousounidis, et al. [15] people don't understand the difference between bacteria and virus and hence, believe that antibiotics are effective against both bacterial and viral infection.

The lack of proper knowledge about antibiotic resistance was obvious since only 15.5% participants were aware of the term antibiotic resistance. Interestingly, though majority did not know about antibiotic resistance, many parents did appreciate that antibiotics if used in every situation or in large amounts could be harmful. Most of the parents (53.44%) felt that antibiotics are not required every time the child falls sick and 70.68% parents recognized that excessive use of the antibiotics could harm their child. These findings were consistent with similar studies done in other countries like Greece where parents considered excessive antibiotics use could lead to antibiotics resistance [17]. These percentages appear higher than other studies done earlier in Bangladesh and therefore, may not be generalized as they indicate the values of one particular urban population setting.

It is noted that 67.24% parents were always compliant with the antibiotics course as prescribed by their pediatrician. These results were comparable to a study done in Malaysia where 71.1% parents mentioned that they complete the course of antibiotics as prescribed by their health practitioners [16,18]. It has been found that 31.03% parents used antibiotics from previous prescription for their child without consulting a doctor. This may be attributed to the easy accessibility of antibiotics as over the counter drugs, in many developing countries including Bangladesh. The rate of self-medication was showed to be higher among the health related students as per a study conducted in South Asian Region [19]. Parents who had previously used antibiotics for their children were better aware about antibiotics and followed healthier practices of antibiotics use. It has shown that parents who had given antibiotics to their children in past might had been advised about the side effects from their health practitioners or pharmacist or learnt from their personal experience with antibiotic use [4,18]. Even other information regarding antibiotics use, compliance and indications may have been clarified to them by their pediatricians [4]. Significant difference was also noted between the education level and knowledge and behaviour of antibiotics use. People with lower level of education were found to lack knowledge regarding antibiotics and misuse antibiotics more. This is an important point, need to be focused in campaigns to reduce misconceptions about antibiotics to the people with lower level of education. This is comparable to a study in Indonesia where also women and people with low level of formal education were found to have more misconceptions about antibiotics [8].

Limitation

We have seen some limitations of our study. Firstly, the survey was conducted in one hospital only and so that the results will not indicate all population of Bangladesh. Secondly, as with other questionnaire studies, it relies on the honesty and recall ability of the respondents. It should keep in our mind that this study took place in an urban

setting where people are usually more literate, with better access to mass media and possibly would have received more information regarding antibiotics than rural settings. Also, it is limited to antibiotics use only in children and further studies may be conducted to evaluate the use of antibiotics in other groups of population.

Conclusion

In this study it was found that misconceptions exist about the use and indications of antibiotics. Lack of knowledge regarding antibiotic resistance was prevalent. Confusion was more among female and those with lower formal education. But participants were aware of the risks associated with use of excessive antibiotics. More interaction with pediatricians and involvement of mass media can help to control the problem of antibiotic resistance. Stringent laws need to be enforced by the government to restrict the access of antibiotics to parents without a prescription.

Conflicts of Interest

The Authors declare no conflict of interest.

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