

Perceptions and Attitudes of Mothers of Under-Five Children about Use of Antibiotics in Childhood Illnesses: A Cross-Sectional Study

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ABSTRACT

Antibiotics are one of the most widely used medicines. They are drugs which kill and arrest the growth of bacteria and are used to treat infections. However, rampant use over the decades has gradually led to the emergence of resistant organisms, threatening to render these drugs ineffective. Children have one of the highest rates of antibiotic use as they tend to suffer from more infections in the formative years of life. The awareness, perceptions and attitudes of mothers about various aspects of antibiotic use like utility, side-effects, consequences of skipping doses, importance of completing the full course of therapy, etc are critical determinants not only of the child's health but also of the cost of healthcare and emergence of resistant pathogens in the long-run. A descriptive cross-sectional study was carried out in the Paediatric OPD of a tertiary care hospital where 700 mothers of under-five children were interviewed. Descriptive statistics and suitable tests like Chi-square test were used to analyse the data. A *P-value* <0.05 was considered statistically significant. The results revealed that about two-thirds of the participants have some basic knowledge that antibiotics are used in treatment of infections. However, many of them also believed that antibiotics are needed in all episodes of childhood illnesses like diarrhoea, including viral infections. The knowledge about antibiotic resistance was poor. Majority of the participants would use antibiotics without a doctor's prescription and most of them wouldn't complete the full course of therapy once the symptoms subsided. The study highlights the scope of scaling up efforts at educating the parents about consequences of these improper practices and the impending menace of antibiotic resistance.

Key words: Mothers, antibiotic use, antibiotic resistance, perceptions, attitudes

INTRODUCTION

The advent of antibiotics was one of landmark moments of modern medicine. Since the discovery of Penicillin by Alexander Fleming, ^[1] we have come a long way in developing drugs that can kill and arrest the growth of bacteria and other microbes with a rich and diverse arsenal of

antibiotics. Many infectious diseases that were once considered incurable and deadly are now amenable to treatment with a few pills. Their use in both preventive and curative therapy has saved life of innumerable patients, reduced morbidity and improved patient care in general. ^[2] But the effectiveness and scope of these drugs is

under grave threat because of antimicrobial resistance (AMR). The ability of bacteria to resist or withstand the bacteriostatic or bactericidal effect of an antibiotic is referred to as antibiotic resistance. [3] It occurs when the drug loses its ability to control bacterial growth in therapeutic concentrations at which it was previously effective. The World Health Organisation (WHO) currently projects 700 deaths per day and predicts that by 2050, there would be 10 million deaths attributable to antimicrobial resistance alone. [4] The situation is similar in the Indian context too, with India harbouring one of the largest burdens of drug-resistant pathogens worldwide, including multi-drug resistant tuberculosis. [5,6] The world today stands at the threshold of a possible reversal to the pre-antibiotic era because of this emerging situation.

The genesis of this menace is multifactorial. From a biological perspective, emergence of drug-resistance is one of the glaring examples of “survival of the fittest” in evolution. The all-pervasive use of antibiotics over the last decades has led to genetic mutations in bacteria that could enable them to survive the therapeutic onslaught. And owing to this selection pressure over the years, these drug-resistant, variant strains have gradually become the predominant variety of bacteria. [7] There is a larger social context behind this. The rampant and often indiscriminate use of antibiotics is caused by numerous factors like self-medication, reuse of left-over antibiotics, non-compliance to the full course of therapy, skipping of doses, availability of these drugs over-the-counter (OTC), etc. [8-11]

The Centers for Disease Control and Prevention (CDC) reports that this problem is of serious concern especially in children because they get sick far more often than adults. The reason is that their immune system is still maturing as it gets exposed to a variety of antigens in the beginning years of life. On an average, children develop 5 episodes of acute respiratory infections and 3 episodes of diarrhoea per year which are

the two biggest causes of under-five mortality and morbidity. [12] Even though most of them are self-limiting, children have the highest rates of antibiotic use. [13] Parental knowledge, perceptions and psychosocial factors are critical determinants of the antibiotic use or overuse among children as demonstrated by validation of the widely acclaimed and reliable instrument, the Parental Perception on Antibiotics (PAPA) scale in various studies. [14] Some authors have also revealed a striking behaviour that influences the interaction between the healthcare seeker and provider. There is a tendency among parents to insist the treating physician to prescribe antibiotics, to such an extent that it was even a deciding factor whether to change the doctor or not, as reported in some studies. [14,15] Lack of awareness about the proper use, indications and side-effects of antibiotics is one of the most crucial reasons behind it. Studies which used the fuzzy trace theory, a concept that predicts medical decision making, to analyse perceptions and attitudes of antibiotic use found that patients base such decisions on categorical gist representations of the minimum information about antibiotics that they have. [16] This, in turn, is determined by factors such as educational level, number of children, previous use of antibiotics, rural or urban dwelling and age. [17-20] Lack of awareness can easily lead to development of unhealthy attitudes like self-medication which are often irrational in terms of the indication and compliance to full duration of the therapy as indicated in various studies. [19] On a broader perspective, this habit has consequences like wastage of resources, probability of adverse drug reactions, incorrect self-diagnosis, delays in seeking appropriate care, and emergence of resistant pathogens. [21-23]

The knowledge and attitudes of the mothers about utility and side-effects of antibiotics and consequences of indiscriminate use thus is an important deciding factor of the antibiotic usage in the children. The present study was therefore

done to assess the perceptions and attitudes of mothers regarding various aspects of antibiotic use and also explore the sociodemographic variables behind it.

MATERIALS AND METHODS

A hospital-based, descriptive cross-sectional study was conducted under the Department of Paediatrics, Agartala Government Medical College and G.B. Pant Hospital, Agartala, Tripura over a period of two calendar months from May 2013 to June 2013. Mothers of under-five children visiting the Paediatric Out-Patient Department of the college were included as participants for the study. Those who were not willing to participate and those who had children above five years of age were excluded.

A total of 700 mothers were interviewed with the aid of a pre-designed and structured interview schedule. They were asked about their knowledge of antibiotics, their perceived utility and indications, side-effects, and their idea about antibiotic resistance. Their attitudes with regard to antibiotic use were also recorded. The sample size of 700 was covered over a 2-month (8 weeks) period by interviewing around 90 mothers per week using convenience sampling method. Over six working days of the week, first fifteen (15) registered mothers who met the selection criteria were interviewed individually and in a face-to-face manner. Approval was obtained from the institutional ethics committee prior to the study. Informed consent was taken from every respondent before starting the interview and information thus obtained was dealt with confidentiality. The data gathered was entered in computer using SPSS version 13 software. Descriptive statistics and suitable statistical tests like Chi-square test were applied. A *P-value* <0.05 was considered statistically significant.

RESULTS

The knowledge of mothers about various aspects of antibiotic use has been shown in

Table 1. It also displays their perceived benefits of antibiotics and their ideas about antibiotic resistance.

Table 1: Knowledge of participating mothers about antibiotic use

Whether respondents had heard about antibiotics (n = 700)	
Yes	472 (67.43%)
No	258 (32.57%)
Knowledge about the utility of antibiotics (n = 472)	
Treats infections	306 (64.83%)
Treats weakness	42(8.90%)
Necessary for growth	28(5.93%)
No idea	96 (20.34%)
Whether antibiotics are required in all episodes of illnesslike diarrhoea (n = 472)	
Yes	287 (60.81%)
No	80 (16.95%)
No idea	105 (22.25%)
Whether antibiotics have a role in viral infections (n = 366)	
Yes	152 (41.53%)
No	50 (13.67%)
No idea	204 (43.22%)
Awareness about side-effects of antibiotic use (n = 472)	
No side-effects	199(42.16%)
Indigestion/ Loss of appetite	32 (6.78%)
Diarrhoea	15 (3.18%)
No idea	226 (47.88%)
Whether antibiotic use affected the immunity of the growing child (n = 472)	
Boosts immunity	88 (18.64%)
Regular use is not good	101(21.40%)
No clear knowledge	283 (59.96%)
Awareness about antibiotic resistance (n = 472)	
Present	54 (11.44%)
No idea	418 (88.56%)

The various attitudes and practices of mothers regarding antibiotic use have been depicted in Table 2. It also shows tendencies of self-medication and reasons for non-compliance to the full duration of treatment.

Table 2: Attitude and practices of participating mothers about antibiotic use

Use of antibiotics without doctor's advice (n = 472)	
Used from previous prescription of the child	71(15.04%)
Sharing of prescription of other children with similar illness	52 (11.02%)
Used from pharmacist's advice	220 (46.61%)
Not used without doctor's advice	129 (27.33%)
Whether they complete the full course of antibiotic therapy (n = 472)	
Yes, always	160 (33.90%)
Sometimes	182(38.56%)
No	130 (27.54%)
Reasons for non-compliance to full course (n = 312)	
Symptoms already subside	228(73.08%)
Costly	37(11.86%)
Causes weakness	47(15.06%)
Whether they insisted the treating doctor to write antibiotics (n = 472)	
Yes	302 (63.98%)
No	170 (36.02%)

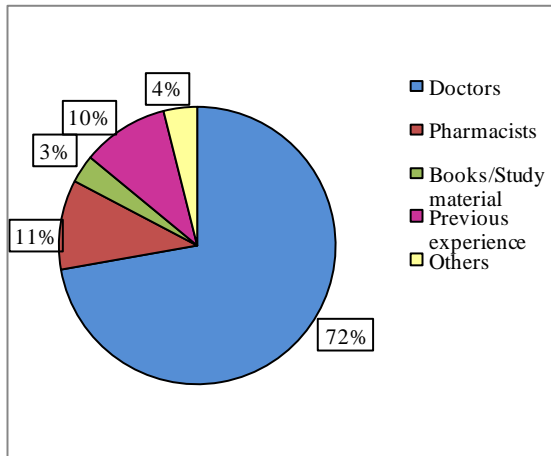


Figure 1: Sources of information or awareness about use of antibiotics

Figure 1 pictorially shows the sources of information and awareness about antibiotics. Understandably, doctors were the major source of information as they are the biggest portal of interaction.

Table 3 shows the distribution of the knowledge and perceptions of the respondents according to their educational level and occupation. The association between these factors was found to be statistically significant (P -value <0.05).

Table 3: Association of knowledge about role of antibiotics and antibiotic resistance with various factors

KNOWLEDGE AND PERCEPTIONS ABOUT ROLE OF ANTIBIOTICS					
Determinants	Satisfactory knowledge		Inadequate / No knowledge		Total
	Number	Percentage	Number	Percentage	
Distribution of the respondents according to educational level ^a					
Illiterate	0	0.00 %	114	100 %	114
Primary educated	59	0.00 %	259	100 %	318
Secondary educated	208	91.63 %	19	8.37 %	227
Graduate and above	39	95.12%	2	4.88 %	41
Total	306	43.71 %	394	56.29 %	700
Distribution of the respondents according to occupation ^b					
Housewife	214	37.74%	353	62.26%	567
Office-goer	38	84.44%	7	15.56 %	45
Teacher	4	80 %	1	20 %	5
Nursing Staff	7	100 %	0	0.00%	7
Unskilled labour	28	52.83 %	25	47.17 %	53
Shop keeper	15	65.22 %	8	34.78 %	23
Total	306	43.71 %	394	56.29 %	700
KNOWLEDGE AND PERCEPTIONS ABOUT ANTIBIOTIC RESISTANCE					
Determinants	Satisfactory knowledge		Inadequate / No knowledge		Total
	Number	Percentage	Number	Percentage	
Distribution of the respondents according to educational level ^c					
Illiterate	0	0.00 %	114	100 %	114
Primary educated	0	0.00 %	318	100 %	318
Secondary educated	19	8.37 %	218	91.63 %	227
Graduate and above	35	85.37 %	6	14.63 %	41
Total	54	7.71 %	646	92.26 %	700
Distribution of the respondents according to occupation ^d					
Housewife	33	5.82 %	534	94.18 %	567
Office-goer	11	24.44 %	34	75.56 %	45
Teacher	2	40.0 %	3	60.0 %	5
Nursing Staff	7	100.0 %	0	0.00 %	7
Unskilled labour	0	0.00 %	53	100.0 %	53
Shop keeper	1	4.35 %	22	95.65 %	23
Total	54	7.71 %	646	92.26 %	700

^a P-value = 0.001, ^b P-value = 0.000, ^c P-value = 0.001, ^d P-value = 0.000 by chi-square test

DISCUSSION

The present study shows that about two-thirds of the respondents had heard of antibiotics, out of which two-thirds were aware that they were used to treat infections. Nearly similar values about the role of antibiotics was also reported by Atif M et al. [24] Chinnasami B et al found in their study that more than 43% of the respondents

believed antibiotics are used against bacterial infections. [25] Majority of our participants believed that antibiotics were needed for all episodes of common childhood illnesses like diarrhoea and they could also treat viral infections (41.3%). Higher numbers have been observed by Atif M et al, [24] Chinnasami B et al, [25] GrigoryanL et al, [26] FilipettoFA et al [27]

and Agarwal S et al. [28] The belief that antibiotics could also treat viral infections stems mainly from “why not take a risk” (WNTAR) attitude which is basically a strategy associated with the decision-making process where the person weighs the risks against a potential positive outcome. Studies have indicated that even when 48% of respondents couldn’t differentiate between bacteria and viruses, 76% would still want an antibiotic. [16] Majority of our participants had no idea about the side-effects of antibiotic use (47.88%) and about the menace of antibiotic resistance (88.56%). Ramegowda et al in their study observed that only 11.5% believed that antibiotics had side effects and 3.1% were aware of antibiotic resistance. [17] Markedly higher awareness about antibiotic resistance as compared to our study has been reported by Jifar A and Ayele Y, [9] Atif M et al, [24] Zyoud SH et al, [29] Roussounides A et al [30] and Pereko DD et al. [31] About 3.18% of the participants in the present study reported that sometimes diarrhoea was observed with use of antibiotics. Chinnasami B et al further reported in their study that nearly half of the parents knew that antibiotic misuse could disturb the gut flora and result in diarrhoea. [25] Also, most of the mothers participating in our study (59.96%) weren’t aware of the effect of antibiotic use on the immunity of the growing child. And nearly one-fifth of them were of the view that regular use wasn’t good. The knowledge and perceptions of the respondents were found to be significantly associated with sociodemographic factors like their educational level and occupation. Similar association was also reported by other researchers. [14,24]

With regard to the attitudes, majority of the mothers who knew about antibiotics (72.67%) would use them without a doctor’s prescription from various sources like pharmacists and by self-medication (previous or shared prescriptions), which was higher than figures reported by Jifar A and Ayele Y [9] and Ramegowda et al. [17] Jifar and Ayele Y further reported in their

study that 90% of their participants were of the view that antibiotics should not be shared from family or friends without a physician consultation. [9] Studies on public attitude towards antibiotic use in India have reported that 76% of antibiotics were used without doctor’s prescription [32] and the tendency of re-use of leftover antibiotics and sharing of prescriptions was approximately 30%. [33] Most of the participants in our study (66.1%) wouldn’t always complete the full course of the therapy. It was almost similar to numbers reported by Islahudin F et al. [34] This contrasts sharply with the findings of Jifar A and Ayele Y [9] and Agarwal S et al [28] where more than 80% respondents recognized the importance of taking the full-course of antibiotics. Majority (73.08%) of our participants stated the subsiding of the symptoms as the reason for non-compliance. A similar reason was also given by majority of the participants in other studies. [28] Near about two-thirds of our participants insisted the treating doctor to prescribe an antibiotic. It was similar to the findings of Chinnasami B et al where about 70% of the participating parents held the belief that antibiotics should always be prescribed by a doctor. [25] This contrasts markedly with the observations of Ramegowda et al, [17] Atif M et al [24] and Chan et al [35] who had reported much lower values.

CONCLUSION

The present study reveals that a considerable percentage of the study populations have some basic knowledge that antibiotics are used in treatment of infections. But at the same time, it also brings to the fore their perceived over-dependence on antibiotics as a therapeutic modality for every episode of childhood illnesses, including viral infections. Since practices of a particular matter are broadly determined by perceptions and awareness on that subject, the same is reflected here. This is underlined by the fact that most of the participants would insist the treating doctor to prescribe antibiotics, often tending

to override the doctor's clinical judgement of the aptness of its necessity. The awareness about side-effects of antibiotic overuse and the emerging problem of antimicrobial resistance among the study population is low. This correlates well with certain attitudinal aspects of the mothers that have been manifested in the study like non-compliance to the full course of therapy, prevalence of self-medication without a doctor's consultation and their perceived utility of antibiotic being required in every case of childhood illnesses like diarrhoea. Since it has been widely acknowledged by the scientific community that misuse of antibiotics is one of the most important causes of antibiotic resistance, [36,37] the awareness levels regarding these aspects have to be scaled up in the community. Dissemination of proper and adequate information on these subjects must be done at all interfaces of contact within the realms of feasibility. This would not only ensure good health of their children, but also be prudent in the long-run by reducing the cost of healthcare and preventing emergence of antibiotic resistance to a great extent.

Future Scope of the study

A similar assessment of the knowledge, attitude and practices about antimicrobials can be further expanded to cover other patients and population groups, using well-validated and meticulous instruments like the PAPA scale. [38] Multi-centric studies will yield a broader and holistic picture.

ACKNOWLEDGEMENTS

The study was conducted as a part of the Short-Term Studentship programme of the Indian Council of Medical Research (ICMR), New Delhi in 2013. The support accorded by ICMR is gratefully acknowledged by the authors.

Conflicts of interest: Nil

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How to cite this article: Dhar DK, Majumder N, Arora R. Perceptions and attitudes of mothers of under-five children about use of antibiotics in childhood illnesses: a cross-sectional study. International Journal of Research and Review. 2019; 6(5):384-391.
