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Knowledge and Behavior of Mothers about Antibiotic Use in Children Under Six Years Old With Upper Respiratory Tract Infections

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Abstract

Background: Upper respiratory tract infections (URTIs) are common in children. The cause of URTIs is usually viral, but parents' attitudes often contribute to inappropriate prescription of antibiotics, promoting antibiotic resistance.
Objectives: The objective of this study was to study the knowledge and behavior of mothers about antibiotic use in children under six years old with URTI.
Methods: Ninty-seven mothers with children under six years were evaluated in a semi-kap study about antibiotic use in children under six years old with URTI. Sampling was done with the convenient method. Data were collected using a researcher-made questionnaire.
Results: The mean age was 30.2 $\pm$ 7.2 years. Maternal knowledge was 8.2 $\pm$ 2.2 (scores ranged from zero to 12) and their performance was 4.1 $\pm$ 1.4 (scores ranged from zero to seven). Mothers had intermediate knowledge and performance. Knowledge was associated with mother and father's education, and mother and father's occupation ($P < 0.05$), but was not significantly correlated with the number of children. ($P > 0.05$) also, performance was associated with mother and father's education, and mother's occupation ($P < 0.05$) but was not significantly correlated with the father's education and number of children ($P > 0.05$).
Conclusions: The study findings suggest that mothers' knowledge and practice in the use of antibiotics is moderate, and lower parental education may lead to unnecessary antibiotic consumption and resistance.

Keywords: Maternal, Knowledge, Practice, Using Antibiotic, URTI

1. Background

Acute respiratory infections in general is a title for upper and lower respiratory infections. Upper respiratory tract infections (ULRI) are common and typically mild and caused by viruses. Organisms that cause respiratory infections at a mild level are Reno, Corona viruses and respiratory syncytial viruses (1). Globally, more than half of child mortality is attributable to pneumonia, diarrhea, malaria and neonatal sepsis (2) and one out of every 50 preschool children dies of acute respiratory infection or associated factors (3). In fact, three main causes of death in acute respiratory infections are pneumonia, bronchiolitis and acute obstructive laryngitis (4). About two-third of deaths due to pneumonia occurred in ten African and Asian countries including India, Nigeria, Congo, Utopia, Pakistan, Afghanistan, Bangladesh, Angola and Niger (5). These deaths are more common in the rural population compared with the urban population (6). Acute respiratory infections could be caused by many different organisms. The clinical symptoms of viral and bacterial acute respiratory infections are the same and it is very difficult to differentiate between them. Lung or pleural aspiration of bacteria through invasive procedures (which increase the risk of serious problems) or blood cultures (which is positive in some cases) can be identified. The location and type of leakage seen on chest X-ray can be helpful to detect whether the infection is viral or bacterial (7). Because of the time-consuming nature of laboratory results and sometimes lack of necessary diagnostic equipment, specialists often make decisions to treat children with primary health facilities (without testing laboratory). Therefore, many detection methods are planned based on easy and rapid diagnostic techniques that are established as scientific approaches (8). Physicians sometimes encounter a dilemma on whether to treat acute ULRI infections with or without antibiotics (9). Unreasonable treatment with antibiotics may lead to the development of bacterial resistance and

at the same time limited access to antibiotics may cause death. In developed countries, upper respiratory infections are treated with absolute limitation (10). In developing countries on the other side, problems in banning antibiotics to treat a bacterial infection due to lack of access to proper information and lack of acceptance by patients avoid the prescription of antibiotics for acute respiratory (11). Arbitrary, widely prescribed antibiotics have been reported worldwide. Generally, antibiotics are accessed from residual antibiotics from previous disease (12) or from the pharmacy without a prescription (13). Evidence from many countries shows that people are often expected that treatment with antibiotics is common for viral infections (14). Antibiotics resistance has become a major global problem. Lack of parents' education, knowledge and no proper performance in the sense of antibiotics resistance has created disorders in the current health situation. Indiscretion in using antibiotics to treat upper respiratory tract infections by parents may be a factor leading to antibiotics resistance.

2. Objectives

The aim of this research was to study parent's knowledges and practice about antibiotic use in less than six year-old children with URTI.

3. Methods

This cross-sectional study was carried out on 97 mothers from those who had referred to the pediatric clinic of Ali Asghar hospital located in the capital city of the province of Sistan and Baluchestan, zahedan, Iran. The present study was performed between October 2014 and 30th of November 2015. Inclusion criteria were having a child less than six years of age with URTI and exclusion criteria was lack of cooperation. This study was approved by the ethics committee of the research deputy of Zahedan University of Medical Sciences, in accordance to the declaration of Helsinki of the world medical association. The random sampling method was applied on those mothers who referred to the clinic for treating their children. A cross-sectional design was applied in order to obtain unbiased sample of referred mothers to the clinic regarding age, gender and socioeconomic status.

Sample size was determined using the following method and required parameters. The required parameters were: P = 0.52, d = 0.1 and $\alpha = 0.05$.

$$n = \frac{\left(1-\frac{\alpha}{2}\right)^2 \times P\left(1-P\right)}{d^2} = \frac{\left(1.96\right)^2 \times \left(0.52\right)\left(0.48\right)}{\left(0.1\right)^2} \quad (1)$$

Mothers were asked to participate in the study after receiving information about the goals of the study. If they were interested they were entered in the study but otherwise replaced with a new candidate. A researcher-made questionnaire was used as the tool for the measurement of the demographic data and knowledge and practices of parents related to antibiotics use in upper respiratory tract infections.

Demographic and socioeconomic questions were included maternal age, educational and job status of parents along with the number of children in the household. There were eight questions regarding parental knowledge and parents were asked to answer "YES I DO" or "NO" with a score of 1.5 and zero, respectively.

1- After receiving the drug from the drugstore, do you study the attached information sheet?

2- Do you believe that antibiotics have side effects?

3- Do you believe that to prevent infection, preventive antibiotic is effective?

4- Have you asked your child's doctor to prescribe antibiotics to recover your child from colds faster?

5- Have you asked your child's doctor to describe drug's effect sides?

6- Do you pay attention to the drug's expiration date?

7- Do you add extra substances to antibiotics due to its bad taste to allow easier intake for your child?

8- Do you pay attention to the expiry date of antibiotics?

Accordance to these questions knowledge scores ranged from 0 to 12 for each individual.

There were six questions regarding parental practice concerned with antibiotics and parents were asked to answer one of the interested items. Each question of this part was in a format of 5-point Likert scale: "1 = strongly agree"," 0.8 = agree"," 0.5 = uncertain"," 0.2 = disagree" and" 0 = disagree strongly with the following questions".

1- How much do you agree with the prescription of antibiotics for your child by the doctor?

2- Do you add extra substances to antibiotics due to its bad taste to allow easier intake for your child?

3- I follow the exact time for consumption of antibiotics for my child

4- I follow the exact dose for consumption of antibiotics for my child

5- I prefer intravenous antibiotics for my child

6- I prefer oral antibiotics for my child

In accordance to these questions, which show the maternal practice, the related scores ranged from 0 to 6 and the questions with inverse value were considered. To verify parent's responses consistency and exclude random completion, two couples of similar questions (where each couple included the same statement expressed in a different

way) and two pairs of contradictory questions (where each question included the reverse statement requiring the opposite answer) were entered in the questionnaire's structure. The statistical analysis was conducted by using the SPSS software version 15. First we obtained Cronbach's Alpha, resulting α = 0.78 and α = 0.72 for maternal knowledge and practice questions, respectively. For all questions except demographics, Cronbach's Alpha was estimated as 0.75. After that Chi-square tests or Fisher's exact test were used with a $P < 0.05$ for consideration of statistical significance.

4. Results

This study analyzed the knowledge and practice scores of 97 mothers of children less than six years old having upper respiratory tract infections and some affected factors. Mean maternal age was 30.2 ± 7.2 years and most of the mothers were aged from 28 to 34 years. The average number of children for every mother was 2.3 ± 1.3. Average scores of knowledge and practice were 8.22 ± 2.2 and 4.1 ± 1.4 with range of 0 to 12 and 0 to 6, respectively. Percentage distribution of 97 mothers related to knowledge was 24.7%, 41.2% and 34.00% for low, moderate and high states, respectively. These distributions related to the practice were 32%, 52.60% and 15.50% for low, moderate and high states, respectively. Maternal knowledge and maternal practice association with socioeconomic factors is shown in Table 1. The table showed that all factors except father's job had a significant association with maternal knowledge and maternal practice. Table 2 shows that number of children per mother, did not have any correlation with both knowledge and maternal practice.

5. Discussion

The study showed that maternal knowledge and their practice increased with education. Similarly, mothers who were employed had higher knowledge and practice than housewives. Father's education had a significant effect on both maternal knowledge and practice. However, the number of children did not show any difference in knowledge and practice. Panagakou showed that the majority of parents did not give antibiotics to their children without doctor's advice and most of them did not believe that the disease is self-limited (15). Maternal knowledge in the study of Panagakou was higher than our study; this could be due to insufficient information and education of our mothers. However, many studies have reported low levels of parental knowledge and practice. Mohan showed that mothers with primary education had low level of understanding about the appropriate use of antibiotics for children with URTI. A significant number of mothers were advised to use antibiotics without prescription for their children (16). Yu et al. (17) suggested low level of awareness of parents on the use of antibiotics. They also reported a high prevalence of self-medication with antibiotics among parents in rural China. In a study by Chan et al. (18) in Malaysia, it was revealed that the majority of parents did not have proper functioning of knowledge about the use of antibiotics for acute respiratory infections in children and they had misconceptions about this. Trepka (19) reported that parental attitude about the effects of antibiotics and antibiotic resistances were changeable due to a direct dialogue between the physician and parents. Horwood used a video on the subject of good judgment to use antibiotics, in the waiting hall of some clinics and hospitals, which influenced parental attitude towards antibiotics. However, changing attitudes of parents did not change the rate of antibiotic prescriptions. The change in attitude of parents in this case is necessary, but is probably not enough to change the pattern of antibiotics prescription (20). An important reason for the poor parental performance or practice against disease may be is due to poor training (21) but Zsóka reported that behavioral and attitude changes among parents only through education is difficult (22). In a study by Huang, parents were divided to two case and control groups. Parents of the case group were under education of learning proper ways of using antibiotics and measured their knowledge after three years. The level of knowledge increased from 8% to 62% for controls when this increase was 7% from 54%. Regarding these two increases, Huang didn't see significant differences. This subject showed that training course for mothers was not enough for changing their knowledge and performance (23). On the other hand, it has been known that the use of public health communication through the media effectively enhances and facilitates behavioral change (24). In this regard, the world health organization and United Nations children's fund adopted a strategy with the aim of controlling the most common childhood diseases in developing countries by improving the skills of health workers in disease control, health system and the performance of families and the society (25). Thus, training programs with emphasis on performance in the health care system is essential. Given the widespread use of mass media in the best way and using these resources could improve the performance of mothers. The training programs should be directed for parents in order to improve their knowledge and performance at health centers.

Table 1. Impact of Socioeconomic Factors on Maternal Knowledge and Practice

Variables	N	Knowledge Score Mean ± Standard Deviation	P Value
Mother education		0.8 ± 0.0	0.001
Illiterate	1		
Primary	19	6.8 ± 1.7	
Secondary	14	7.5 ± 2.3	
Diploma	35	8.4 ± 2.3	
Academic	28	9.2 ± 1.6	
Father education		8.0 ± 0.0	
Illiterate	1		0.001
Primary	14	6.3 ± 1.9	
Secondary	17	7.8 ± 2.1	
Diploma	30	8.4 ± 1.9	
Academic	35	8.9 ± 2.0	
Mother job			0.036
Housewife	69	7.9 ± 2.2	
Employee	25	8.9 ± 1.8	
Father job			0.007
Jobless	8	7.4 ± 2.9	
Free	55	7.7 ± 2.2	
Employee	29	9.2 ± 1.7	
Mother education			0.003
Illiterate	1	3.0 ± 0.0	
Primary	19	3.3 ± 1.5	
Secondary	14	4.4 ± 1.1	
Diploma	35	3.8 ± 1.4	
Academic	28	4.7 ± 1.1	
Father education			0.004
Illiterate	1	3.0 ± 0.0	
Primary	14	3.2 ± 1.1	
Secondary	17	3.9 ± 1.8	
Diploma	30	4.2 ± 1.3	
Academic			
Mother job			0.007
Housewife	35	4.5 ± 1.3	
Employee	69	3.8 ± 1.4	
Jobless	25	4.7 ± 1.2	
Father job			0.083
Free	8	3.4 ± 1.3	
Employee	55	3.9 ± 1.9	
Housewife	29	4.5 ± 1.0	

Table 2. Knowledge and Maternal Practice correlation with Number of Children

Variables	Statistics	Number of Children
Knowledge		
	Correlation	-0.156
	P. value	0.134
Practice		
	Correlation	-0.169
	P. value	0.103

5.1. Conclusion

The results of the present study showed that mean score of maternal knowledge and practice about antibiotics consumption are at a medium level. It was demonstrated that maternal training could reduce the unnecessary use of antibiotics and antibiotics resistance in our society.

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