ORIGINAL ARTICLE

Antibiotic Use in Infants: A Cross-Sectional Survey Assessing the Knowledge, Attitudes and Practices of Health Professionals

Attia Anwar,[1] Rizwan Faisal,[2] Asad Mahmood,[3] Huma Naz,[4] Syed Ali Sibtain,[5] Laiyla Shinwari[6]

Abstract:

Introduction: Antibiotic use has become very common in the Asian countries due to which the community is at risk for producing adverse effects and resistance. Various researches have proved the malprescription of antibiotic. Therefore there is a need to assess the knowledge, attitudes and practices of health professionals working in the community regarding the use of antibiotics.

Objective: To evaluate and compare the knowledge, attitudes and practices of health professionals towards the use of antibiotic in infants.

Material & Methods: In this cross-sectional study a total of 250 health professionals were approached, among which 210 responded and filled the questionnaire. Data after collection was divided and analyzed on the basis of three categories: (i) based on overall response of the health professionals (ii) based on area of practice of the prescribers (in city & remote) and (iii) based on qualification of the prescribers (specialists, postgraduate residents, general physician & allied health staff).

Results: The results of the present study shown that knowledge, attitudes and practices of the health professionals of city area regarding the prescription of antibiotics in infants was better as compared to the prescribers of remote area with significant difference of 0.001. Likewise a significant difference of 0.001 was found between the knowledge, attitudes and practices of the specialists, postgraduate medical residents, general physician and allied health staff. Specialists were found to be the most knowledgeable prescribers while allied health staff were the least.

Conclusion: Health professionals practicing in city areas and the ones who were more qualified i.e Specialists were much better in knowledge, attitudes and practices of prescribing antibiotics in infants.

Keywords: *infants, antibiotic, knowledge, attitude, health professionals*

1. Assistant Professor, Pharmacology Department, Faisalabad Medical University, Faisalabad.
2. Associate Professor, Pharmacology Department, Rehman Medical College, Peshawar
3. Assistant Professor, Pharmacology, Faisalabad Medical University, Faisalabad
4. PhD Scholar GC University Faisalabad,
5. Deputy Drug Controller, Allied Hospital Faisalabad
6. Department of Gynecology & Obstetrics, Govt. P.G.M.I, Lady Reading Hospital, Peshawar, Pakistan

Corresponding Author: Dr. Rizwan Faisal
Associate Professor, Pharmacology Department, Rehman Medical College, Peshawar. Email: drrizwanfaisal@hotmail.com

Received 13-06-2017: Accepted 10-10-2017

Introduction:

Antibiotics are natural or synthetic substances which are used to prevent or treat bacterial infections.[1] They exert their antibacterial actions either by killing bacteria or stopping them from reproducing and spreading.[2] According to modern medicine antibiotics should not be prescribed for every bacterial infection but for those which; (i) are unlikely to resolve without antibiotics (ii) could take too long to clear without treatment (iii) could infect others unless treated(iv) carry a risk of more serious complications.[1] Antibiotics should be selected very

Introduction

Antibiotics are natural or synthetic substances which are used to prevent or treat bacterial infections.[1] They exert their antibacterial actions either by killing bacteria or stopping them from reproducing and spreading.[2] According to modern medicine antibiotics should not be prescribed for every bacterial infection but for those which; (i) are unlikely to resolve without antibiotics (ii) could take too long to clear without treatment (iii) could infect others unless treated(iv) carry a risk of more serious complications.[1] Antibiotics should be selected very carefully because it may produce harmful effects.[3] The safety of antibiotics not only depends upon the type, dose and duration of using antibiotic but also on its pharmacokinetic and pharmacodynamic properties.[4,5]

Infants (newborn to one year of age) are one of the most susceptible population groups to contract illnesses. For this reason the prescribing of antibiotics for pedriatic illnesses by health care professionals is increasing day by day. Worldwide, different studies have shown irrational prescribing of antibiotics to treat common pedriatic illnesses, especially the broad-spectrum antibiotics which have contributed largely to the development of resistance.[6] As the immune system of infants is immature, therefore, they are more vulnerable to mortality and morbidity due to adverse drugs reactions. Irrational use of antimicrobials has been identified as a major problem in many pediatric prescription studies; this could lead to antimicrobial resistance, treatment failures and increased healthcare costs.[7]

For this reason rationale of the current study was to evaluate the knowledge, attitudes and practices of health professionals towards antibiotic use in infants. Up till now very limited work has been done in this regard globally, especially in the Asian countries. In Pakistan it is the first direct cross sectional survey to our knowledge. The results of the study will suggest proper training programmes in order to improve the knowledge, attitudes and practices of the health professionals if they were found lacking the sufficient knowledge.

Material and Methods

This cross-sectional study was conducted in remote and in city areas of Faisalabad by giving structural questionnaire in order to assess the knowledge, attitudes, and practices of the health professionals regarding the use of antibiotics in infants. Convenient sampling was used to approach 250 health professionals, out of which 210 participants responded. A total of 210 participants were included out of these 38 were specialists, 54 were post graduate residents, 91 were general physicians and 27 were from allied health staff (dispensers, nurses, lady health workers). The study was steered from September 2014 to July 2015 after the sanctioning of the Board of Scientific Studies, University of Sargodha, Sargodha. Every participant was inquired to answer the questionnaire which was in English and the time required for answering these questions were approx. 30 minutes. The replies in Yes/No will be considered logical or illogical or nonsense depending on the type of the question (Figure 1). Three categories were made after the collection of data:

- Category 1: based on overall response of the health professionals
- Category 2: based on the area of practicei.e. urban & rural
- Category 3: based on the qualification of the recommenders.e.gspecialists, post graduate residents, general physician and allied health sciences staff.

The detailed facts recorded and scrutinized by using SPSS 18. The scores were presented in proportions according to the answers of the recommenders (Yes, No and Don't Know). Chi-square analysis was used to see the difference between the knowledge of remote and in city recommenders. ANOVA was applied to see any statistical difference between the knowledge of specialists, post graduate residents, general physician and allied health sciences staff

Results

Total health professionals approached were 250, out of which 210 responded (response rate was 84%). The overall responses of health professionals are given in table 1. Responses of the health professionals based on the area of practice (in city & remote) and qualification are shown in table 2and 3 respectively. The knowledge, attitudes and practices of the prescribers of city area was found significantly better as compare to the prescribers of remote area with p-value 0.001. Similarly a significant difference was found between the knowledge, attitudes and practices of the specialists, post graduate residents, general physicians and allied health staff with p-value 0.001. When further comparison was made it was found that knowledge, attitudes and practices of the specialists were significantly better than the postgraduate residents, general physicians and allied health staff with p-value 0.001 each. Similarly knowledge, attitudes and practices of the post graduate residents was statistically significant from the general physicians and allied health staff with p-value 0.001 each while general physicians were found to be good in knowledge, attitudes and practices from allied health staff with p-value 0.001.

Table 1: Responses of the Prescribers to the questionnaire regarding antibiotic use in infants

Prescribers approached=250				
Prescribers responded=210				
	Question No.	**YES**	**NO**	**DON'T KNOW**
KNOWLEDGE	**1**	198	12	0
	2	163	47	0
	3	190	20	0
	4	134	76	0
	5	192	18	0
ATTITUDE	**1**	191	12	7
	2	143	36	31
	3	195	15	0
	4	67	125	18
	5	210	0	0
PRACTICE	**1**	0	210	0
	2	132	78	0
	3	98	112	0
	4	72	138	0
	5	83	127	0

Discussion

The present study to our knowledge represents the first direct survey to assess the knowledge, attitudes and practices of the health professionals regarding the usage of antibiotics in infancy. City prescribers were found to have sound knowledge and better attitudes and practices as compared to remote health professionals. Similarly, a significant difference was found between the knowledge, attitudes and practices of the specialists, post graduate residents, general physician and allied health staff; with specialists at the top and allied health staff at the last. Overall specialists were found to have maximum knowledge and better attitudes and practices than postgraduate medical residents, general physician and allied health staff.

The beneficial role of antibiotics in the improvement of human health is unquestionable, but their frequent use today has shown unwanted and unexpected consequences.[8] There are certain antibiotics if not used cautiously may result in serious complications in infants not only during treatment but later on as well.

Antibiotics are the commonly used drugs in newborns and infants because of their high vulnerability to infections, almost 10 times more that older children.[9,10] Special care is needed to prescribe antibiotics in infants as their body systems especially the hepatic and renal systems are not well developed.[9] Gestational age, chronological age, birth weight and intrauterine growth restriction (IUGR) are the other additional factors that may affect antibiotic therapy.[10,11,12] Dose adjustment and duration of antibiotic therapy are other important elements while prescribing antibiotics in infants and should be based on pharmacokinetic and pharmacodynamic principles.[1] Nevertheless, prescription of antibiotics should be carefully considered on an individual basis, weighing its advantages over disadvantages.[13]

Table 2: *Responses of urban and rural prescribers to the questionnaire regarding antibiotic use in infants*

Urban prescribers 112							
Rural prescribers 98							
	Question No.	PRESCRIBERS OF URBAN AREA			PRESCRIBERS OF RURAL AREA		
		YES	NO	DON'T KNOW	YES	NO	DON'T KNOW
KNOWLEDGE	1	108	4	0	90	8	0
	2	92	20	0	71	27	0
	3	105	7	0	85	13	0
	4	83	29	0	51	47	0
	5	105	7	0	87	11	0
ATTITUDE	1	106	5	1	85	7	6
	2	77	22	13	66	14	18
	3	106	6	0	89	9	0
	4	38	64	10	29	61	8
	5	112	0	0	98	0	0
PRACTICE	1	0	112	0	0	98	0
	2	67	45	0	65	33	0
	3	36	76	0	62	36	0
	4	18	80	0	40	58	0
	5	47	65	0	36	62	0

Table 3: *Responses of the prescribers to the questionnaire regarding antibiotic use in infants on the basis of qualification*

	Question No.	Specialists			Post Graduate Residents			General Physicians			Allied Health Staff		
		YES	NO	DON'T KNOW	YES	NO	DON'T KNOW	YES	NO	DON'T KNOW	YES	NO	DON'T KNOW
KNOWLEDGE	1	38	0	0	51	3	0	88	3	0	21	6	0
	2	36	2	0	47	7	0	79	12	0	1	26	0
	3	38	0	0	54	0	0	83	8	0	15	12	0
	4	37	1	0	43	11	0	52	39	0	2	25	0
	5	38	0	0	53	1	0	84	7	0	17	10	0
ATTITUDE	1	38	0	0	53	1	0	86	3	2	14	8	5
	2	35	3	0	45	3	6	62	13	16	1	17	9
	3	38	0	0	52	2	0	88	3	0	17	10	0
	4	0	38	0	8	45	1	37	40	14	22	2	3
	5	38	0	0	54	0	0	91	0	0	27	0	0
PRACTICE	1	0	38	0	0	54	0	0	91	0	0	27	0
	2	35	3	0	29	25	0	48	43	0	20	7	0
	3	30	8	0	34	20	0	27	64	0	7	20	0
	4	0	38	0	13	41	0	36	55	0	23	4	0
	5	3	35	0	21	33	0	43	48	0	16	11	0
Prescribers approached=250, Prescribers responded=210, Specialists=38, Postgraduate residents =54													
General Physicians= 91, Allied Health Staff= 27													

Various studies are carried out to find the adverse effects of antibiotics when used during infancy and its effects even after infancy. Certain latest studies reported that children who were given antibiotics during infancy were found to have increased weight and risk of obesity as compared to those children who were not exposed to antibiotics in their early lives. However, it was not explored adequately whether weight gain and risk of obesity were associated with any specific type, duration and dose of antibiotic or not.[8] Another study performed at Canada revealed that children who received antibiotic courses for five or more times in the first year were found to have 1.5 times increase risk of asthma than in children who didn't get antibiotic courses.[14]

Conclusion:

We conclude that health professionals of city areas were found satisfactory in knowledge, attitudes and practices regarding antibiotic use in infants as compared to the health professionals working in remote areas. Likewise, specialists were better than rest of the health professionals in this regard.

Grant Support & Financial Disclosures: None.

Conflict of interest: We, the authors declare that we have no conflict of interest.

References

1. Faisal R, Anwar A, Sibtain SA. Assessment of prescribers' knowledge regarding antibiotic prescription in patients with chronic kidney and liver disease. Professional Med J. 2017;24(5):781-786.
2. Hameed A, Naveed S, Qamar F, Alam T, Abbas SS, Sharif N. Irrational use of antibiotics, in different age groups of Karachi: a wakeup call for antibiotic resistance and future infections. J Bioequiv Availab. 2016;8(5):242-45.
3. Tejada BM. Antibiotic Use and Misuse during Pregnancy and Delivery: Benefits and Risks. Int J Environ Res Public Health. 2014;11(8): 7993–8009.
4. Harms RW. Mayoclinic [Internet].[place unknown]: [publisher unknown]; 2017 [cited 2017 Apr 4]. Available from: Pregnancy week by week. http://www.mayoclinic.org/healthy-lifestyle/pregnancy-week-by-week/expert-answers/antibiotics-and-pregnancy/faq-20058542.
5. Amarapukar DN. Prescribing medications in patients with decompensated liver cirrhosis. Int J of Hepatol. 2011; 67-72.
6. Idrizi EA, Dauti M, Malaj L. Irrational prescribing of antibiotics in pedriatic outpatients: A need for change. J of Pedriatic Sciences.2015;7:4-11.
7. Fadare J, Olatunya O, Oluwayemi O, Ogundare O. Drug Prescribing Pattern for Under-Fives in a Paediatric Clinic in South-Western Nigeria. Ethiop J Health Sci. 2015;25(1):73–78.
8. Saari A, Virta LJ, Sankilampi U, Dunkel L, Saxen H. Antibiotic Exposure in Infancy and Risk of Being Overweight in the First 24 Months of Life. Pediatrics. 2015;135(4):617-26.
9. Chirico G, Barbieri F, Chirico C. Antibiotics for the newborn. J Matern Fetal Neonatal Med. 2009; 22(3):46-9.
10. KU LC, Smith PB. Dosing in neonates: special considerations in physiology and trial design. Pediatr Res. 2015; 77:2–9.
11. Rao MH, Khan S, Waseem T, Naeem S, Sabir S. Sepsis in Infants: Analysis of Bacterial Pathogens and their Antibiotic Susceptibility, A Study at Government Tertiary Care Hospital, Karachi. J Dow Uni Health Sci. 2013;7(1):35-40.
12. Vidal AC, Murphy SK, Murtha AP, Schildkraut JM, Soubry A, Huang Z et al. Associations between antibiotic exposure during pregnancy, birth weight and aberrant methylation at imprinted genes among offspring. Int J Obes. 2013; 37(7):907-13.
13. Kenyon SL, Taylor DJ, Tarnow-Mordi W, ORACLE Collaborative Group Broad-spectrum antibiotics for preterm, prelabour rupture of fetal membranes: the ORACLE I randomised trial. ORACLE Collaborative Group. Lancet. 2001; 357(9261):979–88.
14. Anita L, Kozyrskyj, Ernst P, Allan B. Becker. Increased Risk of Childhood Asthma From Antibiotic Use in Early Life. Chest. 2007; 131(6): 1753-59.

Conflict of Interest : None
Funding Source: None