KNOWLEDGE, ATTITUDES AND PRACTICES OF HEALTH PROFESSIONALS TOWARDS ANTIBIOTIC USE IN PREGNANCY: A CROSS-SECTIONAL SURVEY

Laiyla Shinwari[1], Attia Anwar[2], Rizwan Faisal[3✉], Syed Ali Sibtain[4]

ABSTRACT

OBJECTIVES:

To evaluate the knowledge, attitudes and practices of health professionals (HPs) towards the use of antibiotic in pregnancy.

To compare the knowledge, attitudes and practices of HPs towards the use of antibiotic in pregnancy on the basis of their area of practice and qualification.

METHODS: This cross-sectional study was performed at district Faisalabad of Pakistan. Out of 250 HPs approached, 210 HPs 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 HPs (ii) based on area of practice of the HPs (urban & rural) and (iii) based on qualification of the HPs (consultants, postgraduate trainees, general practitioners & paramedics).

RESULTS: HPs having sound knowledge regarding antibiotic use in pregnancy were 88% in urban and 58.5% in rural areas. Attitude was good in 83.5% urban and 67.8% of rural HPs. Practices of HPs were good in 71% of urban and 48.1% of rural areas. Results of the comparison based on the qualification of HPs were as follows; 99% consultants, 91.4% post graduate trainees, 87.6% general practitioners and 46.6% paramedics were good in knowledge; 94.2% consultants, 86.8% post graduate trainees, 87.9% general practitioners and 57.7% paramedics were found to be good in attitudes; 83.1% consultants, 71% post graduate trainees, 61% general practitioners and 29.6% paramedics were good in practices.

CONCLUSION: Health professionals practicing in urban areas and more qualified HPs (consultants) were much better in knowledge, attitudes and practices of prescribing antibiotics in pregnancy.

KEYWORDS: Pregnancy (MeSH); Antibiotic (MeSH); Knowledge (MeSH); Attitude (MeSH); Fetus (MeSH).

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1 Department of Gynecology & Obstetrics, Govt. Post Graduate Medical Institute Lady Reading Hospital, Peshawar, Pakistan

2 Assistant Professor, Pharmacology Department, Faisalabad Medical University, Faisalabad, Pakistan

3✉ Associate Professor, Pharmacology Department, Rehman Medical College, Peshawar, Pakistan

Tel: +92-333-9120587

E-mail: drrizwanfaisal@hotmail.com; rizwan.faisal@rmi.edu.pk

4 Deputy Drug Controller, Allied Hospital Faisalabad, Pakistan

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INTRODUCTION

Pregnancy is a special physiological state where prescribing antibiotics and other medication seems to be a challenge as it may cause harm to developing fetus. The ability of certain drugs to cross the placenta and alteration in drugs pharmacokinetics during pregnancy lead to increased risks of teratogenicity. Though it is better to avoid unnecessary medications in pregnancy but still it cannot be totally avoided because some pregnant women may have chronic pathological conditions that require continuous or interrupted treatment. New infections may also arise or old ones can worsen during pregnancy requiring drug therapy.[1]

Antibiotics are among the more frequently prescribed types of medication during pregnancy. Recent estimates suggest that >40% of pregnant women are given some type of antibiotic. The selection of an antibiotic must be done cautiously as some of them may produce teratogenic effects on developing fetus along with other harmful effects.[2] Safety depends on various factors, including the type of antibiotic, dose and duration of using antibiotic and trimester of pregnancy.[3] In 1979, the United States Food and Drug Administration (FDA) developed a classification system for drugs, including antibiotics, with regard to their potential teratogenic effects on fetus. FDA has divided drugs into five categories: category A, category B, category C, category D and category X. Category A drugs are considered to be the safest while category X drugs are the most teratogenic ones.[4]

According to different studies, 29.7% of women are reported to take antibiotics either 3 months before getting pregnant or during pregnancy.[5] Approximately one in four women are prescribed an antibiotic during pregnancy and its use during the third month of pregnancy is at peak.[6] Antibiotic exposures during pregnancy have been associated with both short-term (e.g., congenital abnormalities) and long-term effects (e.g., changes in gut microbiome, asthma, atopic dermatitis) in the newborn. It is found that mothers of babies with birth defects are more likely to take antibiotics during pregnancy than mothers with healthy babies.[7]

Keeping in view the significance of accurate antibiotic therapy in pregnancy the current study was conducted in order to evaluate the knowledge, attitudes and practices of health

TABLE I: RESPONSES OF THE HEALTH PROFESSIONALS TO THE QUESTIONNAIRE REGARDING ANTIBIOTIC USE IN PREGNANCY (n=210)

Variables regarding antibiotic use in pregnancy	Question No.	Yes	No	Don't Know
Knowledge	1	194	16	0
	2	175	35	0
	3	177	33	0
	4	168	42	0
	5	195	15	0
Attitude	1	200	0	10
	2	168	24	18
	3	187	7	16
	4	83	124	3
	5	210	0	0
Practice	1	18	192	0
	2	115	95	0
	3	96	114	0
	4	55	155	0
	5	98	112	0

professionals towards antibiotic use in pregnant women. To our knowledge it is the first direct cross sectional survey in our area. The results of the study will suggest proper training programs in order to improve the knowledge, attitudes and practices of the health professionals if they were found lacking the sufficient knowledge.

METHODS

This cross-sectional study was conducted in urban and rural areas of Faisalabad district of province Punjab, Pakistan through a self-designed questionnaire in order to evaluate the knowledge, attitudes and practices of the health professionals regarding the use of antibiotics in pregnancy. Health professionals approached were 250 by convenient sampling, out of which 210 participants responded. Among these 210 participants; 38 were consultants (who completed their specialization), 54 were post graduate trainees (who were doing their specialization), 91 were general practitioners (medical graduates) and 27 were paramedics (compounders, nurses, lady health visitors). The study was conducted from September 2014 to July 2015 after the approval of the Board of Scientific Studies, University of Sargodha, Sargodha. The participants were approached individually and requested to answer the questionnaire. Their names were kept confidential. The language of the questionnaire was English, and the time for answering it was approximately 30 minutes. While making the questionnaire, questions were designed in such a way that, if the answer of a particular question is Yes/No, it will be considered rational or irrational depending on the type of the question (Figure 1, Supplementary Data). Data after collection was divided into three categories:

Category 1: based on overall response of the health professionals

Category 2: based on the area of practice i.e. urban & rural

Category 3: based on the qualification of the health professional i.e. consultants, post graduate trainees, general practitioners and paramedics.

Statistical Analysis: The data was entered and analyzed by using SPSS 18. The results were presented in percentages according to the answers of the health professionals (Yes, No and Don't Know). Chi-square analysis was

TABLE II: RESPONSES OF URBAN AND RURAL HEALTH PROFESSIONALS TO THE QUESTIONNAIRE REGARDING ANTIBIOTIC USE IN PREGNANCY

Variables regarding antibiotic use in pregnancy	Question No.	HEALTH PROFESSIONALS OF URBAN AREA (n=112)			HEALTH PROFESSIONALS OF RURAL AREA (n=98)			P-value (Chi-square test)
		Yes	No	Don't Know	Yes	No	Don't Know	
Knowledge	1	106	6	0	88	10	0	0.001
	2	96	16	0	79	19	0	
	3	93	19	0	84	14	0	
	4	95	17	0	73	25	0	
	5	103	9	0	92	6	0	
Attitude	1	112	0	0	88	0	10	0.001
	2	94	13	5	74	11	13	
	3	106	2	4	81	5	12	
	4	44	68	0	39	56	3	
	5	112	0	0	98	0	0	
Practice	1	5	107	0	13	85	0	0.001
	2	47	65	0	68	30	0	
	3	39	73	0	57	41	0	
	4	26	86	0	29	69	0	
	5	45	67	0	53	45	0	

TABLE III: RESPONSES OF THE HEALTH PROFESSIONALS TO THE QUESTIONNAIRE REGARDING ANTIBIOTIC USE IN PREGNANCY ON THE BASIS OF QUALIFICATION

Variables regarding antibiotic use in pregnancy	Question No.	Consultants (n=38)			Post Graduate Trainees (n=54)			General Practitioners (n= 91)			Paramedics (n=27)			P-value (ANOVA)
		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	52	2	0	85	6	0	19	8	0	0.001
	2	38	0	0	51	3	0	79	12	0	7	20	0	
	3	38	0	0	51	3	0	79	12	0	9	18	0	
	4	36	2	0	43	11	0	78	13	0	11	16	0	
	5	38	0	0	53	1	0	87	4	0	17	10	0	
Attitudes	1	38	0	0	54	0	0	91	0	0	17	0	10	0.001
	2	35	3	0	45	7	2	80	4	7	8	10	9	
	3	38	0	0	52	0	2	87	1	3	10	6	11	
	4	8	30	0	19	35	0	40	51	0	16	8	3	
	5	38	0	0	54	0	0	91	0	0	27	0	0	
Practices	1	0	38	0	0	54	0	4	87	0	14	13	0	0.001
	2	14	24	0	24	30	0	57	34	0	20	7	0	
	3	13	25	0	20	34	0	47	44	0	16	11	0	
	4	2	36	0	13	41	0	21	70	0	19	8	0	
	5	3	35	0	21	33	0	48	43	0	26	1	0	

used to see the difference between the knowledge of urban and rural health professionals. ANOVA was applied to see any statistical difference between the knowledge of consultants, post graduate trainees, general practitioners and paramedics while Tukey's test was used for post hoc analysis. $P \leq 0.05$ was considered statistically significant.

RESULTS

A total of 210 questionnaires were completed (response rate was 84%). The overall responses of the health professionals are given in Table I. Responses based on the area of practice (urban & rural) are shown in Table II while their responses on the basis of qualification are given in Table III. The knowledge, attitudes and practices of the health professionals of urban area was found significantly better as compare to the health professionals of rural area with p-value 0.001 each (Table II). Similarly, a significant difference was found between the knowledge, attitudes and practices of the consultants, post graduate trainees, general practitioners and paramedics with p-value 0.001 (Table III). When further comparison was made it was found that knowledge, attitudes and practices of the consultants were significantly better than the postgraduate trainees, general practitioners and paramedics with p-value 0.001 each. Knowledge and practices of the post-graduate trainees was statistically significant from the general practitioners with p-value 0.01 each while the difference in terms of attitudes was insignificant. Similarly, knowledge, attitudes and practices of the post-graduate trainees were found significantly different when compared with that of paramedics with p-value 0.001 each while general practitioners were found to be good in knowledge, attitudes and practices from paramedics with p-value 0.001 each (Table IV).

DISCUSSION

The current 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 pregnancy. The present study suggested that knowledge, attitudes and practices of the urban health professionals were found better than the rural health professionals. Likewise, a significant difference was found between the knowledge, attitudes and practices of the consultants, post graduate trainees, general practitioners and paramedics; with consultants at the top and paramedics at the last. Consultants were found to be the health professionals with maximum knowledge than postgraduate medical trainee, general practitioners and paramedics.

Pregnancy is characterized by various immunological, hormonal and metabolic changes in order to support the growth of the developing fetus and placenta.[8] Among the prescribed medication in pregnancy antibiotics account for 80%.[9] In Europe at least one antibiotic is prescribed almost one in five pregnant women while in the United States, the rate is double.[10] Nevertheless, prescription of antibiotics should be carefully considered on an individual basis, weighing its benefits versus drawbacks for both the fetus and the mother.[11]

Pregnant women are at more risk to develop infections especially in the developing countries like Pakistan due to multiple reasons. According to a study in Peshawar, the prevalence of urinary tract infections (UTI) in pregnant women was 29.5% which was high as compare to non-pregnant women.[12] Sexually transmitted infections were reported in about 23% of pregnant women attending antenatal clinic in Peshawar.[13] In another study bacterial vaginosis was responsible to infect 21% of the pregnant women.[14] As the prevalence of bacterial infections during pregnancy are high in the developing countries, therefore, frequency of prescribing antibiotics is more in these countries. In Pakistan 3.5

TABLE IV: COMPARISON OF THE KNOWLEDGE, ATTITUDES AND PRACTICES OF THE HEALTH PROFESSIONALS REGARDING ANTIBIOTIC USE IN PREGNANCY (TUKEY'S TEST)

Variables regarding antibiotic use in pregnancy	Comparison among health professionals		P-value (Tukeys Test)
Knowledge	Consultants	Post Graduate Trainees	0.001
		General Practitioners	0.001
		Paramedics	0.001
	Post Graduate Trainees	General Practitioners	0.01
		Paramedics	0.001
	General Practitioners	Paramedics	0.001
Attitudes	Consultants	Post Graduate Trainees	0.001
		General Practitioners	0.001
		Paramedics	0.001
	Post Graduate Trainees	General Practitioners	0.06
		Paramedics	0.001
	General Practitioners	Paramedics	0.001
Practices	Consultants	Post Graduate Trainees	0.001
		General Practitioners	0.001
		Paramedics	0.001
	Post Graduate Trainees	General Practitioners	0.01
		Paramedics	0.001
	General Practitioners	Paramedics	0.001

is the average number of drug per prescription in which 76% are antibiotics.[15]

Antibiotic selection plays a vital role in the cure of bacterial infections and it becomes more important during pregnancy as it poses a major clinical challenge. Not only the marked physiological changes in pregnancy produce alterations in the pharmacokinetics (absorption, distribution, biotransformation, and excretion) of drugs but also the trans-placental transfer of drugs from maternal to fetal blood and tissues, leading to potential effects on the fetus, is another major concern.[16,17] Thus, both mother and fetus must be included in the risk/benefit assessment to ensure a rational decision, weighing the therapeutic benefits of the treatment to the mother against its potential harm to the fetus.

LIMITATION OF THE STUDY

As this study is based on single district so more similar studies are needed to generalize the results.

CONCLUSION

The results of the current study shown that health professionals of the urban areas were found better in knowledge, attitudes and practices from their rural counterparts regarding prescription of antibiotics in pregnancy. Similarly, consultants were also found to be good than rest of the health professionals in this regard.

Recommendation

Our recommendation is that government and non-government organizations should properly educate all the health care providers especially the paramedics and the ones who are practicing in rural or urban areas but not in touch with the modern medicine & research.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under:

LS: Concept& study design, analysis & interpretation of data, drafting the manuscript, final approval of the version to be published

AA & SAS: Acquisition, analysis and interpretation of data, drafting of manuscript, final approval of the version to be published.

RF: Analysis and interpretation of data, drafting the manuscript, critical review, final approval of the version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

CONFLICT OF INTEREST

Authors declared no conflict of interest

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