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

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

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## ABSTRACT

**Objective:**

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

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

**Material & Methods:** This cross-sectional study was performed at district Faisalabad of Pakistan. Total 250 prescribers were approached, among which 210 prescribers responded and filled the questionnaire. Data after collection was divided and analyzed on the basis three categories: (i) based on overall response of the health professionals (ii) based on area of practice of the prescribers (urban & rural) and (iii) based on qualification of the prescribers (consultants, postgraduate trainees, general practitioners & paramedics).

**Results:**

The results of the current study revealed that knowledge, attitudes and practices of the prescribers of urban area regarding the prescription of antibiotics in pregnancy was better as compared to the prescribers of rural area with significant difference of 0.01. Similarly a significant difference of 0.001 was found between the knowledge, attitudes and practices of the consultants, postgraduate medical trainees, general practitioners and paramedics. Consultants were ranked at top while paramedics at last in this regard.

**Conclusion:**

Prescribers practicing in urban areas and the ones who were more qualified i.e 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).

## 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.[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 is conducted in order to evaluate the knowledge, attitudes and practices of health professionals towards antibiotic use in pregnant women. To our knowledge it is the first direct cross sectional survey in Pakistan. 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.

## 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. The participants were approached individually and requested to answer the questionnaire. Their name were kept confidential. The language of the questionnaire was English, and the time for answering it was approx. 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). 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 prescriber 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 prescribers (Yes, No and Don't Know). Chi-square analysis was used to see the difference between the knowledge of urban and rural prescribers. 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.

**QUESTIONNAIRE REGARDING ANTIBIOTIC USE IN PREGNANCY TO BE ASKED FROM PRESCRIBERS:**

**NAME:**..... **DESIGNATION:**.....

**GENDER:**.....**PROFESSION:**.....**QUALIFICATION**.....

**SPECIALITY:**.....**DESIGNATION:** .....

**INSTITUTION:** .....

**WORKING ADDRESS:** .....

**CONTACT NO.** ..... **E.MAIL:**.....

| Sr. No. | QUESTION | YES | NO | DON'T KNOW |
|---|---|---|---|---|
| | **Respondents' knowledge towards antibiotics use in pregnancy** | | | |
| 1. | Do you know whether broad spectrum or narrow spectrum antibiotics with highest efficacy are preferred in pregnancy? | | | |
| 2. | Keeping in view the risk of teratogenicity can you list three antibiotics which are safe in pregnancy? | | | |
| 3. | Can you name the antibiotic which increases the risk of ototoxicity in fetus if used in pregnancy? | | | |
| 4. | Can you name the antibiotic which may cause yellowish discoloration of fetal teeth if used in pregnancy? | | | |
| 5. | Can you name an antibiotic leading to neonatal jaundice/kernicterus if taken near term by pregnant ladies? | | | |
| | **Respondents' attitudes towards antibiotics use in pregnancy** | | | |
| 1. | Do you agree with the opinion that in pregnancy every antibiotic is not safe? | | | |
| 2. | Do you agree that ideally culture and sensitivity report must be done before using antibiotics in pregnant women? | | | |
| 3. | Do you think that in pregnancy, use of antibiotics having wide therapeutic index should be encouraged? | | | |
| 4. | Do you agree with the opinion that after first trimester of pregnancy every antibiotic can be given safely? | | | |
| 5. | Do you think that health professionals should know all the details regarding antibiotic prescription in pregnancy? | | | |
| | **Respondents' practices of prescribing antibiotics in pregnancy** | | | |
| 1. | Do you prescribe antibiotics which are not safe in pregnancy? | | | |
| 2. | Do you prescribe antibiotics in pregnancy without culture and sensitivity test? | | | |
| 3. | Do you prescribe antibiotics empirically without true diagnosis in pregnancy? | | | |
| 4. | Do you prescribe multiple antibiotics for rapid recovery in pregnant ladies just for the satisfaction of patients? | | | |
| 5. | Do you prescribe antibiotics in pregnancy for suspected infection which is without fever? | | | |

**Figure 1:** Questionnaire to assess knowledge, attitudes and practices of prescribers' towards antibiotics use in pregnancy (it will be better to adjust this figure after methods i.e before starting results)

## RESULTS:

A total of 210 questionnaire were completed (response rate was 84%). The overall responses of the prescribers' are given in table 1. Responses based on the area of practice (urban & rural) are shown in table 2 while their responses on the basis of qualification are given in table 3. The knowledge, attitudes and practices of the prescribers of urban area was found significantly better as compare to the prescribers of rural area with p-value 0.01. 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. 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. Similarly knowledge, attitudes and practices of the post graduate trainees was statistically significant from the general practitioners and paramedics with p-value 0.01 each while general practitioners were found to be good in knowledge, attitudes and practices from paramedics with p-value 0.001.

**Table 1:** Responses of the prescribers to the questionnaire regarding antibiotic use in pregnancy

| Prescribers approached=250 | | | | |
|---|---|---|---|---|
| Prescribers responded=210 | | | | |
| | **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 |

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

| Urban prescribers 112<br>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 | 106 | 6 | 0 | 88 | 10 | 0 |
| | 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 |
| | 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 |
| | 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 2:** Responses of the prescribers to the questionnaire regarding antibiotic use in pregnancy on the basis of qualification

| Prescribers approached=250<br>Prescribers responded=210<br>Consultants =38<br>Postgraduate residents =54<br>General practitioners= 91<br>Paramedics = 27 | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Question No. | Consultants | | | Post Graduate Trainees | | | General Practitioners | | | Paramedics | | |
| | | 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 |
| | 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 |
| | 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 |
| | 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 |

**DISCUSSION:**

The current study to our knowledge represents the first direct survey to assess the knowledge, attitudes and practices of the prescribers regarding the usage of antibiotics in pregnancy. The present study suggested that knowledge, attitudes and practices of the urban prescribers were found better than the rural prescribers. 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 prescribers 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] In another study bacterial vaginosis was responsible to infect 21% of the pregnant women.[13] 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 is the average no of drug per prescription in which 76% are antibiotics.[14]

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 transplacental transfer of drugs from maternal to fetal blood and tissues, leading to potential effects on the fetus, is another major concern.[15, 16] 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.

**CONCLUSION:**

The results of the current study shown that prescribers 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 prescribers in this regard.

Our recommendation is that governmental and non-governmental 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.

**Grant Support & Financial Disclosures:** None.

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

**REFERENCES:**

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