DRUGS IN PREGNANCY

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ABSTRACT

Objective: During pregnancy, various drugs associated with a contraindication, hence their application is limited and dangerous to mothers along with the fetus. Even though during pregnancy, medication is less preferred but in some instances cannot escape treating the ailments in mother. So here we discussed the medication that can be used safely during pregnancy along with the drugs which are unsafe or highly contraindicated for both mother and the fetus; the problems or complications may be attributed to possible drug interactions during the pregnancy.

Methods: The study was conducted from October 2018 until February 2019 in Baghdad, Iraq. It is conducted in four hospitals: Baghdad teaching hospital, Iraqi Red Crescent Society, Saint Raphael (Al Rahibat) Hospital, and Al-Elwiya Educational Hospital. The medical staff in these hospitals assessed for their knowledge about drug effects, complications, and safety during pregnancy. Those medical staff assayed was divided into three groups: Physicians, pharmacists, and other medical staff (47 pharmacists, 38 physicians, and 15 nurses who participated in this study).

Results: We found that the majority of doctors and pharmacists useful information on pregnancy categories which is a good indicator of the knowledge of these specialists as the subject of drugs and their impact on pregnant women and the fetus is sensitive and vital because it affects all segments of society**.**

Conclusion: It is the responsibility of all clinicians, including pharmacists, to counsel patients with complete, accurate, and current information on the risks and benefits of using medications during pregnancy.

Keywords: Pregnant women, Pregnancy category medication, Congenital malformations, Placenta.

INTRODUCTION

Pregnancy is a unique physiological condition where drug treatment presents a particular concern. Careful consideration of the benefit to the mother and the risk to the fetus is required while prescribing drugs during pregnancy [1], the use of drugs during pregnancy calls for special attention because in this case in addition to the mother, the health and life of her unborn child is also at stake. The drugs given to pregnant mothers for therapeutic purposes may cause severe structural and functional adverse effects in the developing child [2]. Since it is tough to determine the effects on the fetus before marketing new drugs due to obvious ethical reasons, most drugs not recommended to use during pregnancy [3]. Drug treatment during pregnancy presents a particular concern due to potential teratogenicity effects of some drugs and physiologic adjustments in the mother in response to pregnancy [4,5]. The health and life of her unborn child are also at risk [6]. The drug or metabolite concentration may be even higher in the embryonic or fetus compartment than in the mother. As a result, the fetus as an "additional" patient demands a strict pharmacotherapeutic approach. Total avoidance of pharmacological treatment in pregnancy is not possible. It may be dangerous because some women become pregnant with medical conditions that require ongoing and episodic treatment [5]. Sometimes, drugs are, therefore, essential for the health of the pregnant woman and the fetus. In such cases, a woman should talk with her physician or other health-care providers about the risks and benefits of taking the drugs. For instance, in chronic conditions such as epilepsy, bronchial asthma, diabetes mellitus [7], or infectious diseases, treatment is obligatory regardless of pregnancy [5]. In contrast, inessential products such as cough preparations, pregnancy supporting substances, high doses of vitamins, and minerals contraindicated as their potential risks outweigh their unproven benefits. Appropriate dispensing is one of the critical steps for rational drug use, including minimizing the use of teratogenicity drugs during pregnancy [8,9]; a drug dispenser must have relevant and updated knowledge and skills regarding the dispensing of drugs during pregnancy. A misperception of the risk may lead to inappropriate decisions for pregnancy outcomes. On the other hand, perception of risk may influence a woman's decision to take a needed drug during pregnancy [10]. There is a general perception that drugs are not safe in pregnancy, even though fewer than 30 drugs shown to cause significant malformations in humans [11]. Avoidance of unnecessary use of drugs during pregnancy, as well as knowledge and awareness of care providers and pregnant women concerning the harmful effect of drugs, is of great significance. Community retail pharmacies represent a readily and easily accessible point of contact for the public where they obtain medicines, drug information, and medical advice [12,13]. These premises are particularly crucial in developing countries, where many people do not have medical insurance. Drug dispensers have an essential role in providing correct information and pharmaceutical services to patients, including pregnant women. Since it reported that women generally overestimate the risk of teratogenicity of drugs [14], it is essential for health-care providers, including drug dispensing personnel to use evidence-based information to reduce unnecessary anxiety and to ensure safe and appropriate drug use during pregnancy [10] non-medical exposures to drugs:

Non-medical exposures to drugs during pregnancy occur in suicide gestures (technically a subcategory of substance abuse) and substance abuse (i.e recreational use) suicide gestures occur among approximately 1% of pregnant women.

As there are numerous gaps in knowledge about deleterious consequences for the fetus, prescription drug use by pregnant women should view as a public health issue. Pharmacoepidemiological studies can measure the extent of prescription and teratogenicity drug use in

pregnant women. Therefore, in this study, we conducted a field survey to identify the extent to which health service providers know the determinants of drug use during pregnancy.

SUBJECTS AND METHODS

The study was conducted from October 2018 until February 2019 in Baghdad, Iraq.

It is conducted in four hospitals: Baghdad teaching hospital, Iraqi Red Crescent Society, Saint Raphael (Al Rahibat) Hospital, and Al-Elwiya Educational Hospital.

The medical staff in these hospitals assessed for their knowledge about drug effects, complications, and safety during pregnancy. Those medical staff assayed was divided into three groups: Physicians, pharmacists, and other medical staff (47 pharmacists, 38 physicians, and 15 nurses participated in this study). The purpose of this study is to what extent the guidelines of drugs in pregnancy followed, which medical staff group is more informed and to attain insights into their experiences when providing medication advice for pregnant women, obtaining further insight into the use of medical drugs that considered to be associated with teratogenicity mechanisms by determining their dispensing rates among pregnant women — because of the limited systemic uptake after topical administration, resulting in a reduced potential to cause congenital disabilities, and locally acting drugs excluded from the survey.

Descriptive statistics are used to describe the basic features of the data in a study. They provide simple summaries about the sample and the measures. Together with simple graphics analysis, they form the basis of virtually every quantitative analysis of data.
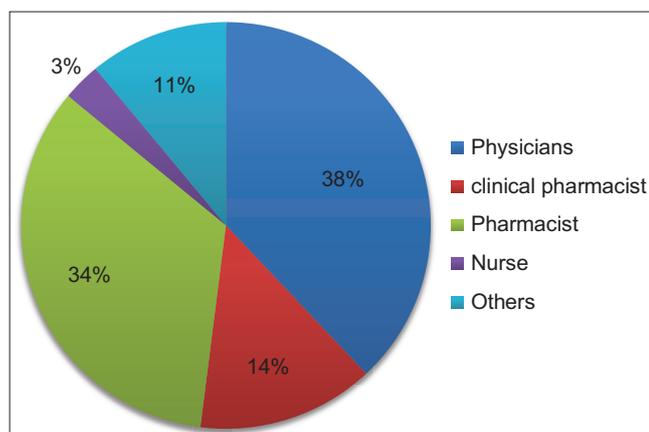

Fig.1: Sample scientific specializing

Table 1: Cronbach's alpha

Reliability statistics	
Cronbach's alpha	Number of items
0.788	7

Cronbach's alpha is used to test reliability which refers to the degree to which the results obtained by measurement and procedure can be replicated.

Pearson correlation coefficient shows the validity which expresses the degree to which a measurement measures what it purports to measure. These validity tests are categorized into two broad components, namely, internal and external validities. Internal validity refers to how accurately the measures obtained from the research were quantifying what it was designed to measure, whereas external validity refers to how accurately the measures obtained from the study sample described the reference population from which the study sample was drawn.

Likert scale

It is a psychometric scale where questions based on this scale are normally used in a survey. It is one of the most widely used question types in a survey.

Yes	Little bit	No
3	2	1

We can use Cronbach's alpha to test the reliability of the measurement.

From the previous Table 1, we find that Cronbach's alpha coefficient of the questionnaire axiom equals 0.788 which means the stability of the questionnaire is acceptable if it is returned on the same sample and in the same circumstances.

The Pearson correlation coefficient shows the validity of the questionnaire as the following Table 2 shows the results:

From Table 2, we can see that there is a significant correlation between the axiom and all the statements, as the sig is <0.05, so it means that the axiom attains high validity.

From Table 3, we found that 38% of the samples are physicians, 34% are pharmacists, 14% are clinical pharmacists, and 3% are nurses.

Moreover, the following Fig. 1 shows these results:

From Table 4, we found that 78% of the samples are working in hospitals, 12% are working in the university, and 6% are working in private pharmacy.

Moreover, the following Fig. 2 shows these results:

Table 5 shows us the trends of the sample opinions toward the statements of the questionnaire, as the sample has a low agreement toward the statement "Do you have any previous information about the pregnancy category Medication?," and a moderate agreement toward the statement "In your opinion, all the risks of drugs can cause congenital Malformations?," and a moderate agreement toward the statement "In your opinion, any drugs can cause fetal toxicity necessarily crosses through the placenta?," and a high agreement toward the statement "according to your knowledge, the warning of medication during pregnancy applied in Iraq?," and a low agreement toward the statement "In your opinion, the subject needs follow-up from the pharmacist

Table 2: Pearson correlation of the axiom and its statements

	Pearson correlation	Sig.
Do you have any previous information about the pregnancy category medication?	0.403**	0.000
In your opinion, all the risks of drugs can cause congenital malformations?	0.390**	0.000
In your opinion, any drugs can cause fetal toxicity necessarily crosses through the placenta?	0.502**	0.000
According to your knowledge, the warning of medication during pregnancy applied in Iraq?	0.338**	0.001
In your opinion, the subject needs follow-up from the pharmacist syndicate?	0.252*	0.011
Do you think it is safe to use any herbal drugs in pregnancy?	0.393**	0.000
Do you have any comments you add?	0.389**	0.000

syndicate?," and a moderate agreement toward the statement "do you think it is safe to use any herbal drugs in pregnancy?," and a moderate agreement toward the statement "do you have any comments you add?."
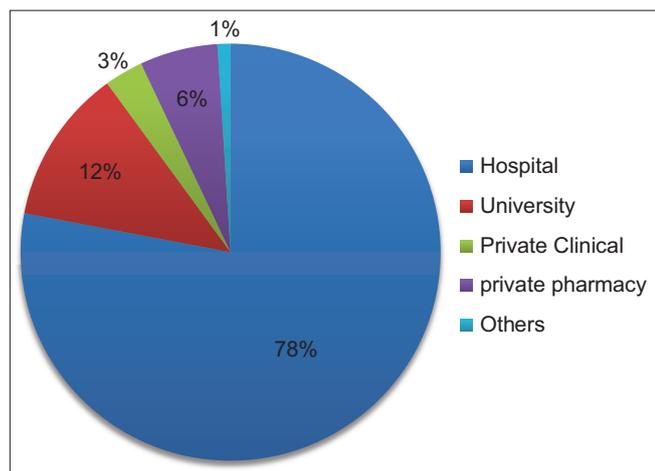

Fig.2: Sample experience

Table 3: Sample scientific specializing

	Frequency	Percent
Physicians	38	38.0
Clinical pharmacist	14	14.0
Pharmacist	34	34.0
Nurse	3	3.0
Others	11	11.0
Total	100	100.0

Table 4: Sample experience

	Frequency	Percent
Hospital	78	78.0
University	12	12.0
Private clinical	3	3.0
Private pharmacy	6	6.0
Others	1	1.0
Total	100	100.0

RESULTS

The first hypothesis, "there is a significant difference between the sample opinions according to their scientific specializing" (Table 6).

From Table 7, we find that there is a significant difference between the sample opinions according to their scientific specializing, as p=0.03 is <0.05, so there is a significant difference between the sample opinions according to their scientific specializing as the high mean is for nurses in the sample.

The second hypothesis, "there is a significant difference between the sample opinions according to their experience" (Table 8).

From Table 9, we find that there is a significant difference between the sample opinions according to their experience, as p=0.02 is <0.05, so there is a significant difference between the sample opinions according to their experience as the high mean is for private clinical in the sample.

DISCUSSION

In this study, we found that the subject of the research was important and worthy of study and through the collection of specialized questionnaires prepared previously by researchers claiming that we have obtained useful information serve as a basis for the continuation and development of research in the future to serve the public interest where we found that the majority of doctors and pharmacists useful information of pregnancy categories which is a good indicator of the knowledge of these specialists as the subject of drugs and their impact on pregnant women and the fetus is a sensitive and vital because it affects all segments of society (Table 1), in terms of the risks of drugs to pregnant women, if all these risks are congenital malformations, the opinion of the target in the questionnaire was that it is not necessary that all these risks causing birth defects, but can affect the fetus in other aspects during his life, the extent of knowledge of the medical staff of the impact of these drugs also showed the answers to the importance of the doctor or pharmacist in educating the community about these drugs and the extent of their various effects on the fetus or mother alike, when asked whether all the drugs that are dangerous to the fetus pass through the placenta, the pharmacists' answers were more accurate than the doctors and the other medical staff in the study, indicating that the pharmacists are more familiar with the toxicity of the drug and its interactions within the body and it does not have to be dangerous the medicine is limited to only drugs that pass through the placenta as there are some drugs affect the fetus and do not pass through the placenta. As for the issue of drugs in pregnancy and whether the subject applied in

Table 5: Trends of the sample opinions toward the statements of the questionnaire

The statements	Yes	No	Little bit	Mean	SD	The degree
Do you have any previous information about the pregnancy category medication?						
Frequency	74	5	21	1.47	0.82	Low
Percent	74.0	5.0	21.0			
In your opinion, all the risks of drugs can cause congenital malformations?						
Frequency	8	80	12	2.04	0.45	Moderate
Percent	8.0	80.0	12.0			
In your opinion, any drugs can cause fetal toxicity necessarily crosses through the placenta?						
Frequency	34	50	16	1.82	0.69	Moderate
Percent	34.0	50.0	16.0			
According to your knowledge, the warning of medication during pregnancy applied in Iraq?						
Frequency	25	30	45	2.20	0.82	High
Percent	25.0	30.0	45.0			
In your opinion, the subject needs follow-up from the Pharmacist Syndicate?						
Frequency	79	10	11	1.32	0.66	Low
Percent	79.0	10.0	11.0			
Do you think it is safe to use any herbal drugs in pregnancy?						
Frequency	7	75	18	2.11	0.49	Moderate
Percent	7.0	75.0	18.0			
Do you have any comments you add?						
Frequency	22	78	0	1.78	0.42	Moderate
Percent	22.0	78.0	0			

Table 6: Descriptive the difference between the sample opinions according to their scientific specializing

Descriptive								
The dimension								
	n	**Mean**	**SD**	**SE**	**95% Confidence interval for mean**		**Minimum**	**Maximum**
					Lower bound	**Upper bound**		
Physicians	38	13.47	1.97	0.32	12.83	14.12	9.00	18.00
Clinical pharmacist	14	13.14	1.70	0.46	12.16	14.13	10.00	16.00
Pharmacist	34	13.21	1.81	0.31	12.58	13.84	11.00	17.00
Nurse	3	15.33	0.58	0.33	13.90	16.77	15.00	16.00
Others	11	11.82	1.66	0.50	10.70	12.94	9.00	14.00
Total	100	13.21	1.89	0.19	12.83	13.59	9.00	18.00

Table 7: Comparison of basic parameters according to their scientific specializing

ANOVA					
The dimension					
	Sum of squares	**df**	**Mean square**	**F**	**p value**
Between groups	37.540	4	9.385	2.812	0.030
Within groups	317.050	95	3.337		
Total	354.590	99			

Significant if the *p=0.05

Table 8: Descriptive the difference between the sample opinions according to their experience

Descriptive								
The dimension								
	n	**Mean**	**SD**	**SE**	**95% Confidence interval for mean**		**Minimum**	**Maximum**
					Lower bound	**Upper bound**		
Hospital	78	13.03	1.87	0.21	12.61	13.45	9.00	18.00
University	12	13.83	1.95	0.56	12.60	15.07	11.00	17.00
Private clinical	3	14.33	1.15	0.67	11.46	17.20	13.00	15.00
Private pharmacy	6	14.17	2.04	0.83	12.02	16.31	12.00	16.00
Others	1	11.00					11.00	11.00
Total	100	13.21	1.89	0.19	12.83	13.59	9.00	18.00

Table 9: Comparison of basic parameters according to their scientific experience

ANOVA					
The dimension					
	Sum of squares	**df**	**Mean square**	**F**	**p value**
Between groups	21.475	4	5.369	1.531	0.020
Within groups	333.115	95	3.506		
Total	354.590	99			

Significant if the *p=0.05

Iraq, there was a difference of opinion because of the different bodies and disciplines that belong to the medical staff and the majority of views indicate that the subject is vital and not applied effectively in Iraq and need more attention; the preparation of specialized warning programs on the dangers of using drugs during pregnancy and most pharmacists and doctors say that most mistakes occur in private pharmacies because of the absence of a pharmacist who is often responsible and turning pharmacists into mere drug distributors without giving any advice to patients. Furthermore, the clinical pharmacists have not taken any real and active role in the hospital, all of which led to poor awareness of the risks of drugs during pregnancy. Moreover, when asked about the medicinal herbs used by pregnant women, most of the answers of the medical staff on the seriousness of the use of some of these herbs during pregnancy as they can affect the mother and the fetus at the same time, and stressed that the use of these herbs is widespread in Iraqi society and the majority.

CONCLUSION

The unique nature of the physiology of pregnancy presents challenges for the pharmaceutical treatment of chronic and acute disorders and symptom management of many complaints associated with pregnancy. It is the responsibility of all clinicians, including pharmacists, to counsel patients with complete, accurate, and current information on the risks and benefits of using medications during pregnancy [15]. Counseling women who have had exposure to drugs about the risk of teratogens involves accurately identifying exposure and quantifying the magnitude of exposure; this may be straightforward for prescribed drugs, but it can be much more difficult with ethanol or other illicit substances or OTC drugs [3]. The use of herbal medicine during pregnancy is a common phenomenon. Different studies revealed that using herbal medicine during the first 12 weeks and the past 12 weeks of gestation is dangerous for the fetus. Pregnant women should consult doctors or pharmacists before using any herbal medicines. The untoward effects of using herbal medicine during pregnancy need further investigation for many herbs. Thus, researches, especially a clinical trial study, should be

conducted to identify the untoward effect of herbal medicine use during pregnancy. We found through our study that there are some problems in advising pregnant women and not giving importance even though it is dangerous [16]. Therefore, we recommend more attention by the pharmacists syndicate by giving specialized educational courses to all members of the medical staff and women in general and follow-up pharmacists in private pharmacies and health institutions by giving the correct instructions using drugs.

AUTHORS' CONTRIBUTORS

Dr. Omar A. Al-Ani selected the topic, research concept development, and guided the research process and manuscript preparation.

Pharmacists; Riyam Hameed, Abu Al-Hassan Jamal, and Atheer Jamil contribute to the collected data.

CONFLICTS OF INTEREST

There are no conflicts of interest.

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