Journal of Population Therapeutics & Clinical Pharmacology

RESEARCH ARTICLE
DOI: 10.47750/jptcp.2023.30.03.030

A statistical study about knowledge pharmacy students with drugs indicated and contraindicated in pregnancy

Alaa Salh Mahdi[1], Fouad Warid[3,4,5], Mustafa Saleem[2]
[1]College of Pharmacy, AL-Bayan University, Baghdad, Iraq.
[2]College of Health and Medical Techniques, AL-Bayan University, Baghdad, Iraq.
[3]Ministry of Education, Baghdad Education Directorate, Karkh first.Iraq.
[4]College of Medicine, University of Warith Al-Anbiyaa, Iraq.
[5]College of Medicine, Al-Ayen University, Iraq.

***Corresponding author:** Alaa Salh Mahdi, College of Pharmacy, AL-Bayan University, Baghdad, Iraq, Email: Alaa.salh@albayan.edu.iq

Submitted: 18 November 2022; Accepted: 20 December 2022; Published: 10 January 2023

ABSTRACT

Background: Because of its specific physiological effects, medication treatment during pregnancy presents special safety issues. For the same reasons that a pregnant woman's own well-being and life are paramount, protecting the life of her unborn child is crucial.

Methods: Pharmacists are increasingly being asked by patients, families, and friends regarding drug use during pregnancy. Since this is not typically discussed in pharmacy school, some pharmacists may feel unprepared to confidently address these issues.

Results: (76.1%) of people filled out the survey. While just 22 percent of respondents believed that alprazolam was prescribed based on a risk-benefit analysis, 69.6 percent believed that the drug was unsafe. Additionally, 65.2% of CPs said amoxicillin is safe to take, whereas just 11.7% knew tetracycline should be used only if the benefits outweigh the risks. Most CPs (92.6%) knew that acetaminophen is completely safe because it may be purchased without a prescription. When asked about the safety of vitamin A supplements, over half of all CPs (48.4%) gave a negative response. On the knowledge exam, CPs' performance varied significantly by age group (P = 0.001).

Conclusions: Even though community pharmacists are the most accessible health care professionals who can advise pregnant women on medication usage, there are still knowledge gaps in areas where training interventions are needed.

Keywords: *medication treatment, pregnancy, acetaminophen, tetracycline, amoxicillin, health care.*

.

INTRODUCTION

Due to the fact that certain pregnant women may be suffering from acute or chronic conditions, it is impossible to totally prevent the use of drug therapy in pregnant women. Vaginal adenocarcinoma caused by clonidine or diethylstilbestrol can take up to 20 years to manifest. About eight out of ten pregnant women said they took some kind of medication, either prescription or over-the-counter. [1]. Consumption of over-the-counter (OTC) medications and remedies should be restricted, and those that are utilized should be done so with extreme discretion. The consumption of some drugs while pregnant can lead to folate-sensitive neural tube abnormalities (also known as NTDs), which are a significant, preventable source of morbidity and mortality around the world. [2] It's possible to stay healthy and avoid this issue. It's often accepted that a pregnant lady provides a healthy environment for her developing baby. However, unlike in a developing child, when a fetus is exposed to drugs, there is no therapeutic adaptation process to help the fetus deal with the alien compounds that have entered its biosphere [3]. Even with medicines that can cause birth defects, the great majority of births that occur with drug use will result in healthy children [4]. Determinants of the potential for teratogenic effects at the time of exposure to a drug include the dose, route, duration, and therapy of the drug, as well as the gestational timing of exposure. [5] It's possible for a drug to be safe at one dosage, but then cause harmful side effects if the dosage is increased above a certain point.

This is called a threshold level. The way in which a drug is taken into the body, known as the route of administration, is equally important. For instance, topical administration will lower the chance of teratogenic effects because there will be less of an impact on the system as a whole. For the purpose of medication absorption. Because t has the ability to cause teratogenic effects throughout pregnancy, prolonged exposure to it may raise the chance of fetal abnormalities. [6],[7] During pregnancy, there needs to be a better balance struck between the potential risks and benefits of pharmacological therapies. It goes without saying that we will make every effort to lessen the danger posed by teratogenic drugs as much as is humanly possible. On the other hand, it is important to emphasize the preventative effect that drugs can have on abnormalities in fetuses that are caused by certain maternal diseases (such as diabetes and hyperthermia). [8] Numerous medications are utilized in order to control the various issues that are linked with pregnancy and motherhood. Antibiotics continue to be an essential part of prenatal care, coming in second only to iron and dietary supplements. [9],[10] One of the tasks of the physician is to assist patients in assessing the potential risks against the potential benefits of a treatment based on the information that is now available.

The fact that there is a lack of consensus in the scientific community on the teratogenic effects of drug use during the first trimester of pregnancy, on the other hand, contributes to an increased sense of risk among clinicians. [11] , Community pharmacists play a vital part in the process of selecting suitable medications and encouraging patients to engage in healthy behaviors. It is necessary to improve pharmacists' knowledge of treatment options for women who are pregnant, and doing so will strengthen the role that pharmacists play in promoting better maternal health. It is of the utmost importance to place an emphasis on the significance of continuing education in pharmacy that is specifically designed to suit the requirements of specialized sectors. The pharmacist who is in charge of dispensing prescriptions should be informed of the hazards associated with taking these drugs during pregnancy as well as their potential advantages. [12],[13] Results from a 2011 cross-sectional survey of drug dispensers and pregnant women in Tanzania found that many participants did not have a complete picture of the risks associated with drug use during pregnancy.

Eighty-six percent of respondents in a cross-sectional research conducted in Qatar in 2016 reported being familiar with the potential benefits and drawbacks of taking medication while pregnant. Sixty-four point seven percent of the pharmacists were licensed. [14]. In 2013, a study was carried out in Saudi Arabia with the purpose of determining the level of knowledge and beliefs on medicine use among pregnant women. According to the findings of the survey, the vast majority of pregnant women have a favorable view of medications in general, but they believe that pregnant women should exercise greater caution when it comes to drug usage during pregnancy.

J Popul Ther Clin Pharmacol Vol 30(3):e284–e290; 10 January 2023.

pregnant It was shown that there was a substantial connection between the participants' level of education and career and their attitudes toward medication. Women reported an inadequate provision of information linked to drugs from both their physicians and pharmacists; as a result, they rely on prescription pamphlets to obtain information. With 23 out of 32 correct, most pregnant women were able to identify medications that should be avoided during pregnancy (59.2% correct). [15].

METHODS

The following is a on pharmacy students studying in the universities of Baghdad, Karbalaa, and Qhi-Qar. The students' knowledge of pregnant medications was evaluated with the help of a questionnaire, which was a set of questions developed especially for the aim of conducting this kind of research. The statistical analysis of the data was carried out with the help of the IBM SPSS Software program, Version 19.0. Medication administration is further complicated by the pregnancy-specific physiological changes. That's because it's not just the mother's well-being and life that's at stake here., the health and life of the mother's unborn child are equally significant. When patients, family members, or friends ask pharmacists about the use of medications during pregnancy, the pharmacists may feel as though they do not have sufficient knowledge to answer these questions with confidence. This is because the topic of medication use during pregnancy is rarely covered in the curriculum of pharmacy schools.

RESULTS

Responses from 351 out of 350 CPs were received, with a return percentage of 76.1 percent. The participants' demographic information is included in Table 1, which may be found here. The ages of the sample, which makes up approximately 71.5% of the study, range from 22 to 24 years old and are in stages 4 and 5.

TABLE 1: Characteristics of the participants with regard to their demographics (N = 256)

Age	Frequency	Percentage (%)
From 22 to 24	183	71.5
From 22 to 23	70	27.3
From 21 to 23	3	1.2
From 22 to 25 years	11	4.3
From 31 to 40	–	–
Asking for pregnancy status		
Always	140	54.7
Often	98	38.3
If she looks pregnant	17	6.6
Never	1	0.4

TABLE 2: The reaction of CPs to the usage of prescription drugs when pregnant.

Medication	Not Safe in the first trimester (%)	Must weigh risks and benefits for individual patients (%)	Safe in the first trimester (%)	I don't know (%)
Alprazolam	178 (69.6)	57 (22.3)	6 (2.3)	14 (5.50
Amoxicillin	15 (5.9)	61 (23.8)	167 (65.2)	12 (4.7)
Budesonide, inhaled	17 (6.6)	190 (74.2)	29 (11.3)	17 (6.6)
Ciprofloxacin	221 (68.3)	22 (8.6)	2 (0.8)	8 (3.1)
Isotretinoin	234 (91.4)	11 (4.3)	1(0.4)	10 (3.9)
Lamotrigine	22 (8.6)	153 (59.8)	23 (9)	57 (22.3)
Contraceptive	172 (67.2)	58 (22.7)	5 (2)	16 (6.3)
Paroxetine	83 (32.4)	160 (62.5)	3 (1.2)	7 (2.7)
Phenobarbital	129 (50.4)	113 (44.1)	2 (0.8)	9 (3.5)
Statins	204 (79.9)	28 (10.9)	13 (5.1)	10 (3.9)
Tetracycline	190 (74.2)	30 (11.7)	27 (10.5)	9 (3.5)
Valproic Acid	125 (48.8)	118 (46.1)	3 (1.2)	10 (3.9)

TABLE 3: The reaction of CPs to the usage of drugs that can be purchased without a prescription during pregnancy

Medication	Not Safe in the first trimester (%)	Must weigh risks and benefits for individual patients (%)	Safe in the first trimester (%)	I don't know
Acetaminophen	2 (0.8)	9 (3.5)	237 (92.6)	8 (3.1)
Aspirin	7 (2.7)	141 (55.1)	94 (36.7)	14 (5.5)
Bismuth subsalicylate	120 (46.9)	71 (27.7)	53 (20.7)	12 (4.7)
Caffeine	16 (6.30	63 (24.6)	170 (66.4)	7 (39.0)
Dextromethorphan hydro bromide	11 (4.3)	66 (25.8)	137 (53.5)	39 (15.2)
Guaifenesin	42 (16.4)	33 (12.9)	164 (64.1)	17 (6.6)
St. John's Wort	202 (78.9)	24 (9.4)	10 (3.9)	19 (7.4)
Ibuprofen	145 (56.6)	47 (18.4)	23 (9.0)	40 (15.6)
Pseudoephedrine hydrochloride	32 (12.5)	87 (34)	101 (39.5)	35 (13.7)
Supplement Vitamin A	124 (48.4)	46 (18)	15 (5.9)	67 (26.2)

TABLE 4: Factors that can affect a pharmacist's level of knowledge

Variables	Mean	Median	SD	P value
Age				
25–35 years	10.5	11	2.7	
36–45 years	9.6	9	2.6	0.001[a]
46–55 years	13	12	1.7	
Country of graduation iraq	10.4	11	2.04	0.015[b]
Others	7.8	7	3.8	
Experience in years Less than 10 years	10.2	11	2.7	0.299[b]
10–20 years	11.3	10.5	2.1	
[a] Kruskal-Wallis. [b] Mann-Whitney U test.				

Five hundred forty-seven point seven percent of all participants inquire their female patients about the possibility of pregnancy.

Table 2 displays the CPs' opinions on the pregnancy-safety of several medicines. While just 22 percent of respondents believed that the decision to use alprazolam was based on a risk-benefit analysis, 69.6 percent said that the drug is not safe. While 65.2% of CPs were under the impression that amoxicillin was harmless, only 11.7% were aware that tetracycline should be given only when the benefits justify the risks. The vast majority of medical staff (91.0%) were aware that isotretinoin should not be used by pregnant women. About a third of clinical pharmacists were able to properly identify that lamotrigine should only be used if the possible benefit justifies the potential danger when it came to medications that impact the central nervous system. Half of practicing pharmacists also realized properly that valproic acid is unsafe. Check out Table 2 for the breakdown.

Table 3 displays the CPs' opinions on the use of OTC drugs while pregnant. As many as 92.6% of CPs reported being familiar with the safety of acetaminophen use during pregnancy. Yet, they doubted that taking aspirin would be safe during pregnancy. But if the benefits of taking ibuprofen during pregnancy outweigh the risks, it could be safe to do so. Guaifenesin is only given when the benefits outweigh the risks, which was news to most CPs. Regarding: Nutrient Supplements The research of over half of all CPs indicates that using vitamin A supplements is not a good idea. It was the consensus of the CPs that first-trimester pregnant women should not take St. John's wort (78.9%).

As an added bonus, the knowledge test scores of CPs varied significantly by both age and country of graduation (P 0.001 and p 0.015, respectively). None of the other variables, including years of experience (p = 0.299), showed statistical significance (Table 4).

DISCUSSION

There haven't been many studies done to determine how much CPs know about the safety of drugs to use during pregnancy. To the best of our knowledge, this is the first study that has been done to assess the information that CPs have regarding the use of drugs by pregnant women. As members of the medical community, one of the most significant responsibilities that CPs have is to monitor and evaluate the safety of any medications that are provided to or taken by pregnant patients. CPs are able to fulfill this function by assisting pregnant women with pharmaceutical counseling and providing them with information regarding various drugs. [16] Certain pharmaceuticals have the potential to cause birth defects due to their make-up. Numerous drugs have been shown to be associated with a higher risk of birth abnormalities. [Citation needed] [Citation needed] The Food and Drug Administration (FDA) in the United States has established five categories (A, B, C, D, and X) to indicate the potential for a drug to cause teratogenicity. This is done to protect pregnant women and their unborn children from teratogenic events that could be caused by the use of certain drugs. In general, medicines that fall under category D or X are considered to have the potential to have teratogenic effects. Many of the pharmaceuticals that are used to treat conditions like hypertension and seizures are classified as either chemicals in either the D or X classes. [17] Furthermore, there are several drugs with additional ratings that, depending on the timing of drug usage and the extent of exposure, can also be harmful to a growing fetus.

This study found that clinical pharmacists lack the expertise to answer patients' questions about the safety of medications during pregnancy. Research has demonstrated that CPs may not always give pregnant women accurate information. 22 A lack of well-designed targeted didactic or training and a dearth of continuing education programs that focus on medication usage during pregnancy may contribute to CPs' inadequate grasp of the safety of drugs while pregnant.

It's important to note that CPs' familiarity with the potential adverse effects of drugs safe for use during pregnancy varies widely depending on the type of medication in question. The majority of the clinical pharmacists who took part in this study agreed that some drugs, such as isotretinoin and statins, should not be used in the first trimester of pregnancy. They also correctly acknowledged that the most widely prescribed drugs during pregnancy (such amoxicillin and acetaminophen) are safe for usage, having discovered no negative effects. These results are consistent with those of a study conducted on pharmacy majors at the universities of Baghdad, Karbalaa, and Qhi-Qar. According to the results of that survey, about 82% of CPs were aware that isotretinoin should be avoided during pregnancy. A second study conducted among doctors and gynecologists reached the same conclusion. [18] However, only 6% of gynecologists correctly determined that tetracycline can be provided in pregnant women based on a benefit-risk analysis, as reported by Morgan et al. The majority of the CPs in our study did not know that paroxetine and valproic acid should not be given during pregnancy. Our results are consistent with those of a previous study that found 35% and 38.9% of community pharmacists, respectively, knew that paroxetine and valproic acid are drugs that should not be used during pregnancy [19].

It was found in another study26 that just 19% of general practitioners and 33% of clinical pharmacists believed that valproic acid posed a danger of producing birth abnormalities in fetuses when administered during pregnancy. Pharmacists may play an important role in advising pregnant women on the appropriate use of OTC drugs, nutritional supplements, and herbal products. Negative effects on the developing baby have been attributed to many OTC medications [20].Pregnant women in South Africa consume a high volume of OTC drugs and herbal items despite the fact that CPs did not show appropriate awareness in the area of presenting information on the safety of using these substances during pregnancy [21]. Some of the CPs in this research did a good job of determining which OTC drugs were safe to take while pregnant. Some examples of these CPs are guaifenesin (12.9%) and ibuprofen (18.4%).

These results are consistent with those of other studies [22].which found that pharmacies are crucial in providing seamless patient care. As a result, there are several strategies that may be implemented to increase CPs' familiarity with the risks and benefits of medications during pregnancy. Community pharmacies might benefit from a pharmacy network system that provides instantaneous access to drug information; pharmacy curricula could be updated to incorporate topics like drug safety training; and pharmacists could take advantage of free continuing education.

CONCLUSION

Community pharmacists are the most accessible health care providers who are able to assist pregnant women with their drug use. They can provide guidance and support to pregnant patients. Although there are some aspects of drug safety during pregnancy that pharmacists are knowledgeable of, there are still knowledge gaps in which training interventions are required.

REFERENCES

1. Lupattelli, O. Spigset, M. J. Twigg et al., "Medication use inpregnancy: a cross-sectional, multinational web-based study,"BMJ Open, vol. 4, no. 2, p. e004365, 2014.
2. Zaganjor, A. Sekkarie, B. L. Tsang et al., "Describing the prevalence of neural tube defects worldwide: A systematic literature review," PLoS ONE, vol. 11, no. 4, Article ID e0151586,2016.
3. S. Kacew, "Fetal consequences and risks attributed to the use of prescribed and over-the-counter (OTC) preparations during pregnancy," International Journal of Clinical Pharmacology and Therapeutics, vol. 32, no. 7, pp. 335–343, 1994.
4. W. S. Webster and J. A. Freeman, "Prescription drugs and pregnancy," Expert Opinion on Pharmacotherapy, vol. 4, no. 6, pp. 949–961, 2005.
5. V. Erdelji´c, I. Franceti´c, K. Makar-Auˇsperger, R. Liki´c, and M. Radaˇci´c-Aumiler, "Clinical pharmacology consultation: a better answer to safety issues of drug therapy during pregnancy?"
6. European Journal of Clinical Pharmacology, vol. 66, no. 10, pp. 1037–1046, 2010.
7. Fisher, N. C. Rose, and J. C. Carey, "Principles and practice of teratology for the obstetrician," Clinical Obstetrics and Gynecology, vol. 51, no. 1, pp. 106–118, 2008.
8. A. Nava-Ocampo and G. Koren, "Human teratogens and evidence-based teratogen risk counseling: the motherisk approach," Clinical Obstetrics and Gynecology, vol. 50, no. 1, pp.123–131, 2007.
9. M. Bullo, S. Tschumi, B. S. Bucher, M. G. Bianchetti, and G. D. Simonetti, "Pregnancy outcome following exposure to angiotensin-converting enzyme inhibitors or angiotensin receptor antagonists: a systematic review," Hypertension, vol. 60, no. 2, pp. 444–450, 2012.
10. E. Kabuluzi, Assessment of risk of drug exposure in early pregnancy in women in a rural community in Malawi, [Doctoral dissertation], University ofManchester.
11. F. B´anhidy, R. Lowry, andA. E. Czeizel, "Risk andbenefitofdrug use during pregnancy," International Journal ofMedical Sciences, vol. 2, no. 3, pp. 100–106, 2005.
12. de Tejada, "Antibiotic use and misuse during pregnancy and delivery: benefits and risks," International Journal of Environmental Research and Public Health, vol. 11, no. 8, pp. 7993–8009,2014.
13. C. Vidal, S. K. Murphy, A. P. Murtha et al., "Associations between antibiotic exposure during pregnancy, birth weight and aberrantmethylation at imprinted genes among offspring," International Journal of Obesity, vol. 37, no. 7, pp. 907–913, 2013.
14. K. B.Mensah, K. Opoku-Agyeman, and C. Ansah, "Antibiotic use during pregnancy: A retrospective study of prescription patterns and birth outcomes at an antenatal clinic in rural Ghana," Journal of Pharmaceutical Policy and Practice, vol. 10, no. 1, p. 24, 2017.
15. S. F.Widnes, "Drug information in pregnancy," in Attitudes and Needs among Pregnant Women and Physicians, 2013.
16. Kamuhabwa and R. Jalal, "Drug use in pregnancy: Knowledge of drug dispensers and pregnant women in Dar es Salaam, Tanzania," Indian Journal of Pharmacology, vol. 43, no. 3, p. 345,2011.
17. S. Boonyaprapa, Self-care in pregnancy and breastfeeding: views of women and community pharmacists in Thailand, [Doctoral dissertation], University ofNottingham.
18. B. Farah, M. Mohamad, E. Ahmed M, and D. Souraya, Knowledge, Attitude And Practice of Community Pharmacists Towards Medications Use during Pregnancy, 2014.
19. Baldon, J.P., Correr, C.J., Melchiors, A.C., Rossignoli, P., Fernandez-Llimos, F., Pontarolo, R., 2006. Community pharmacists' attitudes and knowledge on dispensing drugs to pregnant women. Pharm. Pract. 4 (1), 38–43.

20. Bercaw, J., Maheshwari, B., Sangi-Haghpeykar, H., 2010. The use during pregnancy of prescription, over-the-counter, and alternative medications among Hispanic women. Birth 37, 211–218.
21. Damase-Michel, C., Pichereau, J., Pathak, A., Lacroix, I., Montastruc, J.L., 2008. Perception of teratogenic and foetotoxic risk by health professionals: a survey in Midi-Pyrenees area. Pharm. Pract. (Internet) 6, 15–19.
22. Garcia-Bournissen, F., Tsur, L., Goldstein, L.H., Staroselsky, A., Avner, M., Asrar, F., De Santis, M., 2008. Fetal exposure to isotretinoin – an international problem. Reprod. Toxicol. 25, 124–128.
23. George, J., 2011. Optimising medication use during pregnancy: the potential role of pharmacists. Int. J. Pharm. Pract. 19, 81–83.

J Popul Ther Clin Pharmacol Vol 30(3):e284–e290; 10 January 2023.