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Research Article

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Exploring Knowledge and Perception of Drug Teratogenicity among Community of Pharmacist in Casablanca, Morocco

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ABSTRACT

Introduction: *Community Pharmacists (CP) are easily accessible to the public. They have an important role and responsibility in monitoring the safety of medicines dispensed with or without a prescription during pregnancy.*
The aim of this study was to examine the perception of risk associated with drug use during pregnancy. In specific, knowledge and experience of community pharmacists about safety of medicines during pregnancy will be assessed.
Methods: *A cross-sectional study was conducted between November 2015 and January 2016. Data collection was carried out using a semi structured self-administrated questionnaire. Setting: Community pharmacies in Casablanca, Morocco*
Results: *A total of 190 questionnaires were collected (response rate of 60%). Drugs considered as teratogenic all trimesters by majority of respondents were the following: retinoids, tetracyclines, glucocorticoids. 84% of pharmacists thought there is no risk with using IEC during first trimester of pregnancy. 25% of pharmacists answered there is no risk with oral antidiabetic agents versus 42% for technicians. Nearly 26% of technicians considered there is no risk with anti-epileptic drugs. Concerning non-steroidal anti-inflammatory drug 16% of technicians reported there is safe throughout the pregnancy.*
Conclusion: *Good proportion of the study sample had a misperception (overestimation or underestimation) regarding the possible teratogenic risks of common drug exposures. Results were similar to previous surveys in other countries. These findings evidenced the need for increased training for community pharmacists to optimize medication use during pregnancy.*

Keywords: Community pharmacist; Risk perception; Medication knowledge; Pregnancy; Teratogenic effects

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INTRODUCTION

Ethical reasons preclude inclusion of pregnant women in the vast majority of premarketing clinical trials. As a consequence, most medications are placed onto the market without a directly established safety profile in human pregnancy [1].
Drug use in pregnancy is common. In a recent multinational study the prevalence of drug use at anytime in pregnancy was reported to be as 81.2% [2].
In countries with limited access to teratology information services like Morocco, the community pharmacists are the most accessible health care professionals to the general public. In addition to their traditional role of dispensing medications and treating minor ailments, community pharmacists are considered as an immediate source of drug information for the public. For these reasons, community pharmacists must have sufficient medication knowledge to optimize drug therapy in pregnancy [3].

Perception of the teratogenic risk by community pharmacists will impact their level of counseling and dispensing medications during pregnancy. Overestimating this risk can lead to insufficient treatment of patients, whereas underestimating may lead to hazardous practice [4].
The primary objective of the study was to assess teratogenic and/or foetotoxic risk perception of common medications by community pharmacists and secondary objective aimed to determine the knowledge and practices of pharmacists in Casablanca regarding drug exposure in pregnancy.

METHODS

Between November 2015 and January 2016, a cross-sectional prospective observational study was conducted in pharmacies located in Casablanca; it is considered Morocco's economic capital.
A self-completed questionnaire was distributed to 315 pharmacies randomly selected from different geographical locations; including all licensed pharmacists and pharmacy technicians. Consent was obtained and anonymity of the respondents was maintained.
The questionnaire we used was adapted from many different sources including Damase-Michel (2007) and amended to better suit the target group. Pretesting of questionnaire was done on 8 randomly selected pharmacists. The questionnaire was finalized after ambiguous and unsuitable questions were modified based on the result of pretest.
The questionnaire was divided into three sections: A) Demographic data; B) Risk perception C) About source of drug information.
The questionnaires were analyzed by standard nonparametric descriptive statistics, using SPSS (version 21.0). The chi-scare test was used for inferential statistics comparing the responses between pharmacists and pharmacy technicians. P values of <0.05 were considered statistically significant.

RESULT

Table 1: Demographic characteristics of the participants (N=190)

Variable	Frequency (%)	
	Pharmacist	**Technician**
Gender		
Male	48%	46%
Female	52%	54%
Age group		
<30 years	18%	17%
30-39 years	31%	36%
40-49 years	42%	41%
50-60 years	9%	6%
Years of experience		
- <5 years	15%	19%
- 5-9 years	20%	21%
- ≥ 10	65%	57%

The questionnaire has been completed by 120 pharmacists (Ph) (48% men, 52% women) by 70 technicians (Th) (46% men, 54% women), giving a response rate of 60%.The predominant age group being between 40 and 49 years of age, followed by 30 to 39 years. As shown in Table 1, the participants in this study had a wide range of

experience in practice; the majority (Ph: 65% Vs Th: 57%) of them had more than 10 years in pharmaceutical practice. There were no statistically significant differences in gender, age or years of professional experience between two observed samples.

Drugs considered as teratogenic all trimesters by majority of pharmacist were the following: retinoids, tetracyclines, glucocorticoids, oral antidiabetic agents, non-steroidal anti-inflammatory agents, sodium valproate and anti-thyroid drugs. For technician's pharmacy the most dangerous drugs during pregnancy was listed as follows: tetracyclines, retinoids, glucocorticoids, non-steroidal anti-inflammatory agents, anti-thyroid drugs, barbiturates and antidepressants (Figures 1 and 2).

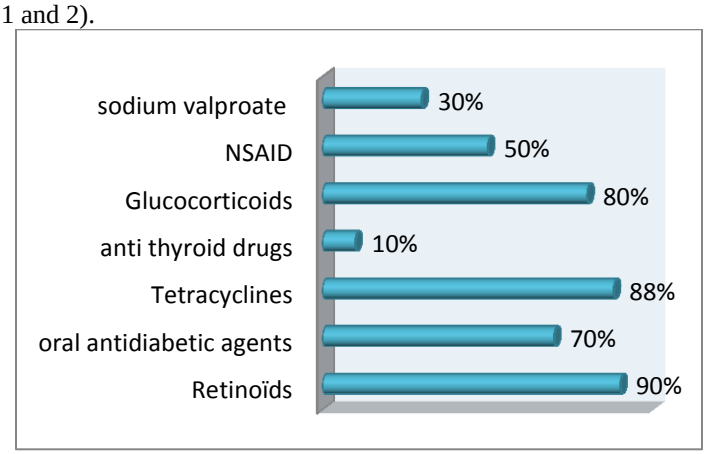

Figure 1: Pharmacist's opinion about drugs considered as teratogenic all trimesters of pregnancy

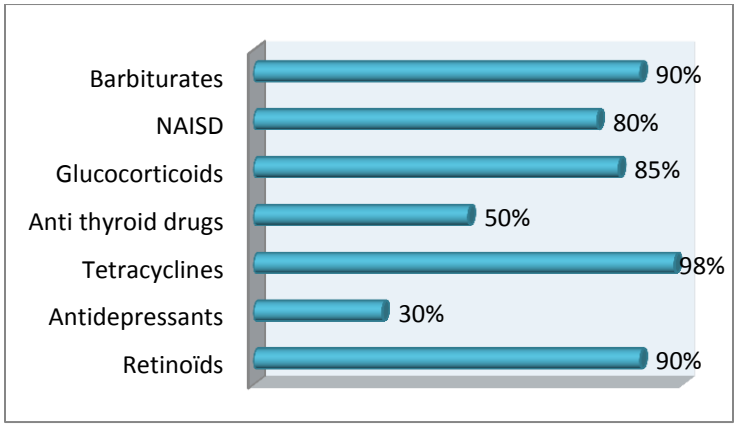

Figure 2: Technician's opinion about drugs considered as teratogenic all trimesters of pregnancy

The respondents estimated the teratogenic risk of each therapeutic class based on the trimester of pregnancy (Table 2). The lowest perception of teratogenic risk was found to be associated with Penicillins. The highest perception of teratogenic risk was found to be related with antidepressants, neuroleptics, benzodiazepines and aminoglycosides.

84% of pharmacists thought there is no risk with using IEC during first trimester of pregnancy. 25% answered that there is no risk with oral antidiabetic agents versus 42% for technicians. Nearly 26% of technician considered there is no risk with anti-epileptic drugs. Concerning non-steroidal anti-inflammatory drug 16% of technician reported there is safe throughout the pregnancy.

Statistically different perceptions of teratogenic potential were found for Central alpha agonists, glucocorticoids and ACE Inhibitors with technician generally giving higher risk estimates.

The evaluation of the awareness of information sources (Table 3) revealed that almost 90% of pharmacists commonly use the VIDAL Book (the French reference formulary) to assess the risk associated with drugs during pregnancy. The large majority of technicians use just the information available on line.

Table 2: Participants' opinion about the teratogenic risk of each therapeutic class based on the trimester of pregnancy.

Therapeutic class	Dangerous						Safe	
	First trimester		Second trimester		Third trimestre			
	Pharm	Tech	Pharm	Tech	Pharm	Tech	Pharm	Tech
Antidiabetic drugs	75%	42%	75%	42%	75%	28%	25%	58%
P	0.06		0.06		0.06		0.05	
Anti-epileptic drugs	95%	57%	95%	64%	95%	74%	5%	26%
P	0.06		0.06		0.23		0.17	
Antidepressants	100%	92%	100%	91%	100%	92%	0%	8%
P	0.06		0.06		0.06		0.041	
Neuroleptics	83%	100%	83%	100%	83%	100%	17%	0%
P	0.56		0.56		0.56		0.14	
Benzodiazepine	98%	94%	98%	94%	98%	94%	2%	6%
P	0.28		0.28		0.28		0.98	
Penicillins	8%	57%	8%	57%	21%	57%	92%	43%
P	0.024		0.024		0.97		0.96	
Aminoglycosides	100%	94%	100%	92%	100%	92%	0%	6%
P	0.06		0.06		0.06		0.65	
Tetracyclines	100%	91%	100%	91%	100%	91%	0%	9%
P	0.14		0.14		0.14		0.74	
NAISD	25%	85%	16%	85%	90%	85%	1%	15%
P	0.16		0.026		0.06		0.09	
Glucocorticoïds	8%	98%	16%	98%	75%	98%	0%	2%
P	0.04		0.03		0.02		0.32	
Vitamin K Antagonist	95%	83%	95%	83%	95%	83%	0%	0%
P	0.09		0.18		0.4		-	
ACE Inhibitors	16%	97%	94%	97%	94%	97%	6%	3%
P	0.03		0.23		0.23		0.9	
Central alpha agonists	8%	100%	16%	100%	16%	100%	84%	0%
P	0.04		0.03		0.03		0.04	

Table 3: Pharmacists' opinion about the information source to assess the risk associated with drugs during pregnancy

Information sources	Frequency (%)
VIDAL	91.70%
Initial training during pharmaceutical studies	30%
Scientific literature	21.80%
Continuing education programs	45.90%

DISCUSSION

This study is the first survey evaluating risk perception of pharmacists and technicians pharmacy regarding drug exposures during pregnancy in Morocco.

The major findings of this study suggest that overall knowledge regarding maternal-fetal medicine is low. It was also found that professional staff of pharmacy use different learning resources to answer drug information requests for pregnant women.

More than 80% of the respondents were aware of the teratogenic risk associated with Retinoids, tetracyclines, valproic acid and glucocorticoids, however it was higher than the value reported for retinoids 89%, valproic acid 62%, glucocorticoids 45.2% respectively, by Damas-Michel et al. [5]

Our results demonstrate the overestimation of teratogenic risk associated with antidepressants. These findings are similar to those reported by Einarson A et al., where it was reported for many pharmacists in Córdoba, in Argentina, advised pregnant women to stop fluoxetine. [6] Selective serotonin reuptake inhibitors (SSRIs) were the most widely used antidepressant class in pregnancy [1,7]. Numerous data are available and a recent comprehensive meta-analysis documented more than 56,000 exposed pregnancies. This analysis found no overall increased risk of major congenital malformations (OR 1.07, CI 0.99-1.17) [4].

The risks of congenital malformations associated with exposure to oral antidiabetic agents (OAAs) and anti-epileptic drugs (AEDs) were underestimated by pharmaceutical technicians.

Administration of an oral anti-diabetic agent instead of insulin appears to be tempting, but there is a paucity of data on the exposure of fetus to their mother's OAAs during pregnancy. Insulin is not transferred through placenta and therefore, remains the optimal anti-diabetic treatment during pregnancy [8].

Adequate seizure control in pregnant women with epilepsy is vital, as frequent and prolonged maternal seizures may have deleterious consequences. However, the treatment of epilepsy during pregnancy is complicated by the teratogenicity of some antiepileptic drugs (AEDs), especially carbamazepine, valproate and phenytoin and by potential pregnancy-induced changes in the pharmacokinetics of AEDs [9,10].

The difference in perception of the teratogenic potential for Non-steroidal anti-inflammatory drugs (NSAID) and Central alpha agonists between pharmacists and pharmacy technicians is noteworthy for several reasons: Non-steroidal anti-inflammatory drugs carry increased risk for premature closure of ductus arteriosus when used in the third trimester, and are contraindicated for use near delivery [11].

Concerning Central alpha agonists, the methyldopa is recommended as first line for antihypertensive therapy in pregnancy [12].

Our survey demonstrated a better knowledge at the pharmacists compared to pharmacy technicians. These findings are similar to those reported by Švitrigailė Grincevičienė. Researchers interpreted these results with difference of educational background [13]. This is an indication that training is necessary for technician's pharmacy to be able to provide quality pharmaceutical care to patients including pregnant women [14].

Conflicting information between various sources cited by pharmacists can also be a limiting factor in decision making when a drug is required during pregnancy [15].

A search of the Internet with the search engine Google may have an important influence on technician's perception of risk. . Unfortunately, technician who read this information are not aware that this is most often not peer-reviewed evidence-based information as anyone can post information on the Internet [16].

Good proportion of the study sample had a misperception (overestimation or underestimation) regarding the possible teratogenic risks of common drug exposures. However a recent study has shown that 57% of the women need information about medications in pregnancy and cited pharmacists among the three most used sources of information, a systematic organization of the counselling service provided to pregnant women by the pharmacists would be of the general importance and is needed in all countries. This might negatively affect the role of Community pharmacists in patient counseling and education [11].

CONCLUSION

In conclusion, this study comes with a number of recommendations: (1) establish and install a teratogen information service for assisting community pharmacists in Morocco; (2) introduce an obligatory course regarding safety of drugs during pregnancy into the pharmacy curriculum; (3) establish a pharmacy continuing education center with a structured education programs; and finally (4) design strategies to support professional development among pharmacy technicians.

LIMITATION OF THE STUDY

Our study has few limitations summarized in the inclusion of less than one third of community pharmacists in Casablanca. Furthermore, the fact that the type and nature of questions used to test perception risk and knowledge were built by the authors might affect the validity of the scores.

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