Cutaneous Adverse Drug Reaction in Morocco – Evaluating the Knowledge of Pharmacists

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Abstract

Background. Pharmacy professionals, as the most available members of medical team, have an important role in educating patients about Cutaneous Adverse Drug Reaction (CADR). Our aim was to evaluate pharmacists' knowledge of the cutaneous drug reaction, and their recommendations under hypothetical situations, through a written questionnaire. **Methods.** based cross-sectional study was conducted among community pharmacists working at the private sector of the rabat-salé-zemmour-zaer region using a structured interviewing questionnaire. **Results.** Ninety- eight pharmacists completed the questionnaire (response rate 48%). The mean overall score was 52.87 ± 23.19% correct answers. The majority of pharmacists (66,32 %) estimated that they view more than a Patient with CADR each month, and only forty-seven pharmacists underwent CADR related training during the year preceding the survey. Pharmacists obtained the highest correct scores on the true/false statements inquiring about Cutaneous reaction due to drugs definition, classification and the most common medication classes implicated in Cutaneous reaction due to drugs, Overall, the true/false questions were relatively easier to address, compared with the multiple choice questions (63.60 ± 13.15% vs. 51.18 ± 24.12%, respectively; $p < 0.01$). Only 14 pharmacists were familiar with Cutaneous reaction due to drugs sach as (Drug Reaction With Eosinophilia, contact dermatitis, Nail Disorders, bullous pemphigoid). Longer time since training completion was associated with a lower total score (38,77 ± 9% vs. 61,22 ± 11% for the pharmacists who were in practice 5 years or less and those with longer time in practice, respectively; $p < 0.05$). **Conclusion.** Pharmacists were knowledgeable regarding some aspects of CADR. However, our study, as in previous studies among health care professionals, identified some gaps in knowledge. These findings indicate the need for better education of pharmacists regarding CADR and its supported.

Keywords: *Cutaneous Adverse Drug Reaction, Pharmacists, Knowledge, Questionnaires*

Introduction

Any unintended harmful reaction to a medicine or drug is known as an adverse drug reaction (ADR) according to the definition by the World Health Organization [1] . The term Cutaneous Adverse Drug Reaction (CADR) is used for dermatoses with involvement of the skin, mucosas, and/or skin appendages, caused by the effect of a substance, usually a drug, which comes into contact with the organism by a range of pathways. Serious cutaneous drug reactions are immunemediated events that are classed as unexpected ADR [2] .

They are the cause of hospitalization in dermatology services for about 1.5% of patients in France [3] , 4.11% in Tunisia [4] , 27% in Togo [5] , 10.40% patients in

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Guinea [6] and have a high degree of semiological variability. Two per cent of these can be severe, with severe sequelae or life threatening [7] . They can occur in all individuals without distinction of age; however, they are less frequent in children with an incidence of 0.9% in the Thiesen et al series in England [8] .

Nowadays, consumers' demand on CADR information is very high and pharmacists, if knowledgeable, are in an ideal position to address this demand. They are the third largest regulated healthcare professional groups in the world [9] . A 2012 report conducted in 90 countries stated that 55% of pharmacists were working in community pharmacies [10] .

To our knowledge, few studies have been published on diseases pharmacists' knowledge, in particular in the past few decades [11,12] . This study was therefore intended to assess the knowledge regarding CADR in a low-income country setting. The findings will support the design of educational programs and objectives by pharmacy schools and professional organizations.

Materials and Method

§ Study Design

This was a cross-sectional study conducted from January 2018 to March 2018, among community pharmacists in the private sector of the rabat-salé-zemmour-zaer region. Data were collected by the authors during the day time working hours and mostly in the morning.

§ Study Tool

A questionnaire was developed by three clinical pharmacists from the coauthors.

The questionnaire consisted of four sections.

The first section collected demographic data of the respondents such as gender, age, the number of years practicing as pharmacist, highest qualification related to pharmacy, Country of academic studies, Estimated number of Patient with CADR /month view in the pharmacy and CADR training over the past year.

In the second section, respondents were questioned about definition of ADRs and CADR, the different categories of CADR and the most medication classes implicated in CADR. the answer in this section was from true/false reponce.

In the third section, respondents were questioned about the pharmacists' possible actions in theoretical situations involving the different types of Cutaneous adverse drug reaction such as Definition, Pathogenesis, Clinical Manifestations: (Onset, Symptoms, Signs), Diagnosis: (Clinical Diagnosis, Differential Diagnosis), Prognosis, Treatment: (Definitive, Symptomatic, Prevention).

In the last section entitled ''comments'' respondents are invited to add comments about Cutaneous adverse drug reaction.

Then, a pilot survey of the questionnaire was carried out with pharmacy department staff. Finally, necessary modifications were made based on the comments received from the pilot survey.

§ **Data collection**

The questionnaire was presented to pharmacists in the private sector of the rabat-salé-zemmour-zaer region. Fifteen minutes were allotted to complete the questionnaire. Pharmacists were not supposed to consult any information resources when they were taking the quiz. We could not validate that the other pharmacists did not use information resources. No financial incentives were offered to encourage participation. However, a document containing detailed answers to the study questions was prepared and distributed among members of the organizations participating in the study.

§ Data analysis

The final score was expressed as the percentage of correct answers of each pharmacist. The option ''I don't know'' was considered a separate category, and included in the estimation of the score per question as a wrong answer. Responders were grouped into one of two categories of duration since graduation from training (five years or less and longer than five years) and of countries in which the Pharm degree was obtained (Morocco, other). Descriptive statistics were obtained for the various variables. Response patterns were evaluated using the two-tailed Mann–Whitney test, the Kruskal–Wallis test, and the Pearson correlation (SPSS software. 10 at the Laboratory of Biostatistics and Clinical Research of the Faculty of Medicine and Pharmacy of Rabat), as appropriate. The results are reported as mean ±standard deviation (SD), unless otherwise indicated. A p-value ≤ 0.05 was considered significant.

Results

A total of 98 pharmacists completed the questionnaire. The response rate was 48%. The compiled demographic data are presented in **Table 1**.

Table 1 Characteristics of study participants.

Parameter		No. (%)
Total participants		**98**
Age (years) [mean ± SD, (range)]		48,5 ± 8.1 (30–64)
Sex	Men	22 (22,45%)
	Women	76 (77,55%)
Country of academic studies	Morocco	72 (73,46%)
	Other	26 (26,53%)
Highest academic degree	PharmD	98 (100 %)
	Other	00 (0 %)
Duration since graduation (years)	0-2	08 (8,16 %)
	3-5	30 (30,61 %)
	6-10	25 (25,51 %)
	11-20	19 (19,38%)
	>20	16 (16,32%)
Occupation	Community/retail pharmacy, full time	92 (93,88 %)
	Community/retail pharmacy, part time	06 (6,12 %)
	Other	00 (0 %)
Estimated number of Patient with CADR view/month	0	27 (27,55 %)
	1-5	30 (30,61%)
	6-10	25 (25,51%)
	11-20	07 (7,14%)
	>20	03 (3,06%)
	Not indicated	06 (6,12%)
CADR training over the past year	None	49 (50 %)
	Academic	43 (43,88 %)
	Other	04 (4,08 %)
	Not indicated	02 (2,04 %)

Most responders were women (77,55%). The majority of pharmacists (66,32 %) estimated that they view more than a Patient with CADR each month, and only forty-seven pharmacists underwent CADR related training during the year preceding the survey. The mean score was 52.87 ± 23.19% (**Table 2**). Overall, the true/false questions were relatively easier to address, compared with the multiple choice questions (63.60 ± 13.15% vs. 51.18 ± 24.12%, respectively; $p < 0.01$).

Table 2 Total scores across all responders.

Selected variables	n = 98, (n [%])
Definition of ADRs and CADR	76 [77.55]
Categories of CADR	43 [43,87]
The medication classes implicated in CADR	68 [69,38]
urticaria	72 [73,46]
angioedema	45 [45,91]
Anaphylaxis	65 [66,32]
bullous pemphigoid	14 [14,28]
pemphigus vulgaris	12 [12,24]
vasculitis	76 [77,55]
Fixed Drug Eruption	92 [93,87]
Pigmentary Disorders	85 [86,73]
Nail Disorders	11 [11,22]
Noncicatricial Alopecia	48 [48,97]
Pruritus Without Rash	78 [79,59]
morbilliform rash	45 [45,91]
contact dermatitis,	18 [18,36]
photosensitivity dermatitis	68 [69,38]
Erythema Multiforme	68 [69,38]
Stevens-Johnson syndrome	35 [35,71]
toxic epidermal necrolysis	34 [34,69]
Drug Reaction With Eosinophilia	15 [15,30]
Acute Generalized Exanthematous Pustulosis	72 [73,46]

Pharmacists obtained the highest correct scores on the true/false statements inquiring about CADR definition, classification and the most common medication classes implicated in CADR. Only 14 pharmacists were familiar with CADR sach as (Drug Reaction With Eosinophilia, contact dermatitis, Nail Disorders, bullous pemphigoid). Across all questions and all study participants, the option ‘‘I don’t know’ was selected in 5.0% of cases. Across all questions and all study participants, the option ‘‘I don’t know ’’ was selected in 2.04% of cases.

Longer time since training completion was associated with a lower total score (38,77 ± 9% vs. 61,22 ± 11% for the pharmacists who were in practice 5 years or less and those with longer time in practice, respectively; $p < 0.05$). In contrast, the total score was not affected by the setting in which the questionnaire was distributed, gender, the country in which the Pharm degree was obtained (Morocco vs. others); whether they underwent some form of training about CADR over the year prior to the survey ($p > 0.05$; data not shown). In addition, the total score was not associated with the number of Patient with CADR seen monthly by the pharmacist ($p > 0.05$) and did not correlate with the responders’ age ($r =-0.1596$, $p > 0.05$).

Nineteen of the pharmacists included in this study added comments under the ‘‘Comments’’ sections of the questionnaires. four comments related to lack of the responder’s knowledge, two stated the need for more extensive education, six referred to the availability of data sources. and the remainder of comments were related to the wording of the statements or the answers.

Discussion

Pharmacists constitute a valuable source of information for patients and prescribers. As such, they should be familiar with various aspects of CADR, including actions taken in theoretical situations involving CADR therapy, and be able to consult patients.

Unfortunately, CADR patients’ knowledge regarding their illness and its treatment is unsatisfactory. Furthermore, pharmacists can be the first to recognize conditions in which the physician should be contacted as soon as possible. Yet, our study found significant knowledge gaps among pharmacists, including those who see Patient with CADR frequently; the mean

score of surveyed pharmacists was only 52.87%. Several responders checked the ‘‘I don’t know’’ option or commented that they don’t know the answer, implying that they were able to admit that they have gaps of knowledge.

Pharmacists obtained the highest correct scores on the true/false statements, in fact pharmacists in this study had good baseline knowledge of definition of ADRs and CADR, the different categories of CADR and the most medication classes implicated in CADR. these elements are very interesting because they facilitate the pharmaceutical management of CADR afterwards.

The duration since professional training completion and a PharmD degree were the only predictors associated with overall score. Longer duration since graduation could be associated with the absence of updated knowledge about CADR. In addition, there was a partial overlap between shorter duration since graduation and a PharmD degree.

The majority of Moroccan pharmacists with a PharmD degree graduated over the past four years from a single Faculty of pharmacy, in which personalized medicine has been an important component of the curriculum. Thus, for both comparisons, the greatest gaps were detected in questions related to Drug Reaction With Eosinophilia, contact dermatitis, Nail Disorders, and bullous pemphigoid. Interestingly, there was no relationship between larger numbers of Patient with CADR seen each month and scores. This is may be explained by reliance on computerized resources and minimal time for interacting with patients and actually consulting them. The setting in which the questionnaire was presented, and therefore the time allowed for their completion and the percentage of practicing pharmacists among the participants, did not affect the scores. Intriguingly, recent training about CADR was not shown to increase performance in completing the questionnaire, although the type of training was not detailed. It is necessary to consider the optimal type of education that may efficiently improve pharmacists’ knowledge and actions. The major limitations of our study are related to potential selection bias, to the partial validation of the questionnaire. The majority of our participants were pharmacists who attend meetings and training courses, who may be more knowledgeable than other pharmacists. Among those who attended the university diploma in pharmacovigilance at the poison center of Morocco, low response rate may further increase the bias towards those who may be willing to answer the questionnaire because they felt more comfortable with

their degree of knowledge. Yet, participants pointed out that the questionnaire was difficult, and that the given options in the situation-related multiple choice questions did not fully reflect the possible options the pharmacist encounters at work as described above. The limited response range also reflects another limitation of the study: asking a clinical question via a multiple choice question.

However, no significant differences were found between the scores of participants in the

various settings of the study. Therefore, our work may be of wider relevance to the healthcare professionals involved in the management of Patient with CADR.

Conclusion

Pharmacists were knowledgeable regarding some aspects of CADR. However, our study, as in previous studies among health care professionals, identified some gaps in knowledge. These findings indicate the need for better education of pharmacists regarding CADR and its supported.

Ethical Clearance: Compliance with Ethical Standards

Source of Funding: Self

Conflict of Interest: We declare that we have no conflict of interest.

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