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Knowledge, Practice and Attitude of Adverse Drug Reaction Reporting and Pharmacovigilance among Hospital and Community Pharmacists in Dhaka City of Bangladesh

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Abstract

Adverse drug reaction (ADR) is a response to a medicinal product which is noxious and unintended. Spontaneous reporting of ADRs has remained the basis of pharmacovigilance and is important in maintaining patient safety. Therefore, we aimed to assess knowledge, practice and attitude of the pharmacists towards pharmacovigilance and ADR reporting. A time series study was used to evaluate pharmacist knowledge, practice and attitude toward ADRs reporting. A structured questionnaire was developed for this purpose and a total of 50 pharmacists were participated in this study. The majority of pharmacists have insufficient awareness and lack of knowledge about pharmacovigilance and ADRs reporting. When pharmacists were asked about what they must do if they want to report an ADR, approximately 86% of pharmacists admitted that they did not know from where they could get the ADRs reporting forms and almost all of them (96%) did not report any ADR. When they were asked about the way that would increase ADR reporting rates, almost all of them claimed that training on ADR reporting would improve it and additionally they told that they would prefer to get a feedback about the reports. These results suggest that Bangladeshi pharmacists have little knowledge about the concept and process of pharmacovigilance and spontaneous ADRs reporting system. However the pharmacists had positive attitudes toward pharmacovigilance, but very little experience with reporting.

Keywords: *Adverse drug reaction, Pharmacovigilance, Hospital and Community pharmacist.*

I. Introduction

World Health Organization (WHO) defines that adverse drug reactions (ADRs) are noxious and unwanted effects produced by the drug, when it is applied for the ailment of disease or diagnosis (Shukla SS *et al.*, 2012). The most common examples of drugs that produce ADRs include paracetamol and nimesulide (hepatotoxic effects) (Rehan HS *et al.*, 2002). Adverse Drug Reactions (ADRs) are associated with a significant morbidity and mortality (Lazarou J *et al.*, 1998, Upadhayai JB *et al.*, 2006). Recent estimates suggest ADRs to be the fourth major cause of death in the Unites States of America (USA) (Bandekar MS *et al.*, 2010). It is a well-known fact that no drug is completely free from side effects. Before executing any new drug in the market, its clinical trial and safety database are validated for the safety profile of the drug. In various countries, whether developed or developing, the issue of ADRs is accepted to effortlessly, and thus it becomes a prime duty to develop awareness among patients about ADRs. When the Food and Drug Administration (FDA) approves a new drug for marketing, its complete adverse advents profile may not be known because of the limitation of pre- approval clinical trials. Typically, clinical trials for new drugs are of short duration and are conducted in populations that number up to 5000, therefore, the most common dose related ADRs are usually detected in the pre-marketing phase while ADRs which are rare and those detected on long term use are not. A case in point is the development of brownish blue pigmentation of nails of a patient on atenolol for 3 years. Another patient on amlodipine for 8 years developed Schamberg's like purpuric pigmentation (Classen DC *et al.*, 1997). Thus reporting of ADRs is considered to be an important step in maintaining and achieving a safe drug therapy use. There are a bunch of examples of drugs, which have been detached as well as outlawed from the European market owing to reported adverse effects of drugs. Rosiglitazone holds the first position in the market; other well-known drugs including terfenadine, cisapride, phenylpropanolamine, rofecoxib, cerivastatin, gatifloxacin, cisapride, sibutramine and

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tegaserod were withdrawn because of their adverse reactions. For every drug in the market, the adverse events, if any, should be inspected in detail, and the facts should be conveyed to the people or public for elucidation of the information (Hampton T, 2005, Lisa A *et al.*, 2003). Most countries developed their national pharmacovigilance systems after the thalidomide disaster in 1960s (Rawlins M.D., 1995). World Health Organization (WHO) has established the definition of pharmacovigilance as "the science and activities relating to the detection, assessment, understanding and prevention of adverse effects or any other possible drug-related problems" (WHO, 2002). Pharmacovigilance plays an essential role in the reduction of ADRs, thus the evolution and growth of this science are critical for effective and safe clinical practice. ADRs spontaneous reporting systems are the basic components for the comprehensive post-marketing surveillance of drug-induced risks (Stricker B.H. *et al.*, 2004). These systems are inexpensive and simple to operate and they enable the generation of signals indicating potential problems, allowing the identification of new and rare ADRs, but also enable continuous monitoring of all drugs used in real life situations from the time they are first marketed. However, their strength is tightly connected to the actual reporting rate by health care professionals (Green C.F. *et al.*, 2001). Pharmacovigilance plays several roles such as recognition, observation, assessment and documentation of drug based problems and understanding the factors producing adverse effects (Ravi Shankar P *et al.*, 2006, Rohilla A *et al.*, 2012). Here we tried to summarize about ADRs, and how it can be monitored by pharmacovigilance to minimize the adverse effects of drugs. Hence, this review will provide adverse events about ADRs along with the complete information of medication errors. Effective and safe pharmacological treatment process requires a team work of the patient and healthcare professionals. Pharmaceutical care includes considering these risks on a patient-oriented basis by "identifying and solving (or avoiding)" drug therapy problems. Although the prescription is written by medical doctors in most countries, pharmacists and nurses have a crucial role in monitoring the treatment and determining the drug related problems and maintaining the safety of medicines. Pharmacovigilance is the science dedicated to the safety of drugs as used in the clinical practice, based on experiences from the clinical practice, thus generating knowledge on the harmful effects of drugs, both at the individual and the population level, that will eventually be applied in the clinical practice and thus lead to a safer use of drugs (Van Grootheest AC *et al.*, 2012). The implementations of pharmacovigilance need enough relevant knowledge about safety of drugs. Satisfactory reporting of suspected adverse drug reactions (ADR) reported by healthcare professionals is all important in this issue. Other than the number of reports, the quality of the reports and assessment of these reports should be conducted in order to alert drug safety professionals to new and potentially important information concerning drug associated adverse reactions. Especially pharmacists, physicians and nurses can play an important role in the detection and reporting of suspected ADR. For instance greater participation by pharmacists in ADR reporting could be an important tool to counter under-reporting of ADRs. It is crucial to encourage pharmacists and other health care providers around the world to report ADR (World Health Organization Collaborating Center for International Drug Monitoring, 2002). Therefore, the community pharmacists should understand their pivotal role in the surveillance of the safe use of medicines in especially outpatients whereas the role of nurses is more apparent for inpatients. Actually, all healthcare professionals need to be actively involved in the surveillance of drug safety issues within the context of their practices. Although their role in pharmacovigilance may vary from country to country, the professional responsibility is the same, regardless of jurisdiction (Aagaard L *et al.*, 2012, FIP, 2006). Drug safety are among the priority issues in medicine (Akici A *et al.*, 2007, Barker KN *et al.*, 2002, Kayaalp S, 2009, Leape LL *et al.*, 1995, Lesar T *et al.*, 2003, Sodha M *et al.*, 2002). Ours is a pilot study which was planned with the aim to investigate knowledge, attitude and practice of the hospital and community pharmacist working in various hospital and community pharmacy in Dhaka city about pharmacovigilance, adverse drug reaction and event reporting.

II. Materials and Methods

Study design, settings and study subjects

This is a time series study that was conducted in the Dhaka city of Bangladesh. The study commenced in September, 2016 and continued for three months. Fifty pharmacists (both community and hospital pharmacists) were included in the study. Each pharmacist was asked to fill a structured questionnaire delivered by hand. The participated pharmacists were from independent and chain pharmacies as well as from

different hospitals. Four hospitals (Square hospital, Popular hospital, Labaid hospital, Apollo hospital) and sixteen community pharmacy in Dhaka city was covered in this study.

III. Questionnaire

The form of the questionnaire consisted of pharmacist demographic data, and some relevant questions that covered three main areas of interest. These areas included: (1) assessment of pharmacist knowledge regarding pharmacovigilance and ADRs reporting, (2) pharmacist's attitude and practice toward ADRs reporting process and (3) pharmacists' recommendations and suggestion to improve the drawback in the system.

IV. Results

Fifty pharmacists (both hospital and community pharmacist) participated in this study. The demographic details of the pharmacists included in the study are shown in Table 1. The majority pharmacists were approximately 20-30 years old (64%) and most of the pharmacist's working experience was one to five years (74%). Mainly B grade pharmacist (44%) involved in this sector where only 22% of A grade pharmacist. In this study, 76% of pharmacists were community pharmacists while 24 % were hospital pharmacists. Males accounted for 96% of pharmacists.

This questionnaire contained two open-ended questions in which the pharmacists were asked to define the terms 'pharmacovigilance' and 'adverse drug reaction'. Of the responding pharmacists, only 24% defined 'pharmacovigilance' correctly while 72% defined ADR correctly. Some pharmacovigilance and adverse drug reaction related questions are answered correctly which 32% and 78% respectively. Only 32% had attended a workshop regarding how to report an ADR. The results are presented in Table 2.

The overall rate of ADRs reporting by pharmacists is shown in Table 3. It is obvious that about 74% of the pharmacists had noticed that they do not get any ADR report from the patients. When pharmacists were asked about what they must do if they want to report an ADR, approximately 86% of pharmacists admitted that they did not know from where they could get the ADRs reporting forms and almost all of them (96%) did not report any ADR. When pharmacists were asked about their preferred method of reporting, 42% of them believed that informing the representative of the drug company verbally, while 28%, 24%, and 6% preferred to report via phone calls to the drug company, using a specific form or by using internet respectively.

The highly rated reasons for under-reporting were ignorance of reaching ADR reporting forms, "ADR reporting not being mandatory", "lack of time", "lack of clinical knowledge" and "refraining the legal liability" (Table 4). When they were asked about the way that would increase ADR reporting rates, almost all of them claimed that training on ADR reporting would improve it and additionally they told that they would prefer to get a feedback about the reports (Table 5). Table 6 demonstrates the thoughts of pharmacists about the importance of ADR reporting. Most of the pharmacists were agreed that ADR reporting is very important because it helps to determine the side effects of newly marketed drugs as well as incidence of any side effects.

V. Discussions

The main aim of this study was to evaluate the attitudes and knowledge of pharmacists toward pharmacovigilance and spontaneous ADRs reporting. There are several reports from different countries which commonly emphasize the problem of the ADRs under-reporting among pharmacists (Generali J.A. *et al.*, 1995, Granas A.G. *et al.*, 2007, Lee K.K. *et al.*, 1994, Toklu H.Z. *et al.*, 2008). To the best of our knowledge, this cross-sectional survey is the first study to evaluate this issue in Bangladesh. The results of the present study firstly demonstrated that the majority of pharmacists have insufficient knowledge and lack of awareness about pharmacovigilance and ADRs reporting systems. The results of this study were consistent with a previous report by Toklu and Uysal in which they showed that 82.5% of the pharmacists were not aware of the concept of pharmacovigilance. Despite the lack of knowledge in the majority of pharmacists, the study showed that the awareness of hospital pharmacists was better compared to community pharmacists which may be related to the fact that hospital pharmacists are in direct contact with other health care professionals such as physicians and nurses who are more often involved in the identification of potential ADRs, thus they are more exposed to situations where there is a need to manage or to report such adverse effects.

Spontaneous reporting of ADRs is an indication of pharmacovigilance awareness, because they are effective for distinguishing serious unexpected ADRs,

medication errors, therapeutic inefficiency and disagreement in drug quality, besides its low cost. Despite the fact that practice of pharmacovigilance varies from country to country, the pharmacists' primary responsibility is the benevolence of each individual, so they are more likely to early detect ADRs than other healthcare professionals. As future pharmacy practitioners, pharmacy students need to be well trained on how to recognize, prevent, and report ADRs, since the involvement of pharmacy students in ADRs reporting has led to a significant increase in the number of documented ADRs in a previous study (Wiholm B.E *et al.*, 2002). Few studies have been carried out to evaluate pharmacy students' knowledge and attitudes toward ADRs reporting (Cullen DJ *et al.*, 1995, Elkalmi RM et al., 2011).

Lack of knowledge is considered the starting point to deal with the problem of under reporting of ADRs, since it was previously shown that pharmacist knowledge exerted a strong influence on ADRs reporting (Herdeiro M.T. *et al.*, 2006). Accordingly, we can expect to have a low rate of ADRs reporting secondary to poor knowledge of reporting procedures, which is consistent with what we found in our study. The rate of reporting of ADRs was extremely poor. The main reason for this low rate of reporting is the lack of knowledge, in which a large number of study participants admitted that they did not know how to report an ADR and if there is a legal authority to report to, they also did not know from where they could get the ADRs reporting forms. Regarding pharmacist perception and attitude toward ADRs reporting, pharmacists showed almost positive attitude toward ADRs reporting process despite the low reporting rate, a pattern similar to other studies (Van Grootheest AC *et al.*, 2012, WHO, 2002). Attitudes are potentially modifiable variables exerting a strong influence on ADRs reporting (Upadhayai JB *et al.*, 2006), the greater the patient attitude the more positive influence on the overall ADRs reporting rate. This issue was proved previously by (Granas *et al.*, 2007) in which they have shown that an educational program can significantly modify pharmacists' reporting-related attitudes and influence the ADRs reporting behavior in a positive manner (Stricker B.H. *et al.*, 2004).

In the present study, almost all the participants agreed that training on ADR reporting would increase the overall reporting rates. They further suggested that making ADR reporting mandatory, promoting ADR reports, providing feedback about it and improving communication between healthcare professionals would improve the number and quality of reporting.

Table 1: Demographic characteristics of the study sample. (N=50)

Parameter		N (%)
Age (years)	20-30	32 (64)
	31-40	13 (26)
	41-50	05 (10)
	51-60	00 (00)
Gender	Male	48 (96)
	Female	02 (04)
Qualification (Pharmacist Grade)	A grade	11 (22)
	B grade	22 (44)
	C grade	17 (34)
Working experience (years)	Less than 1	08 (16)
	01- 05	37 (74)
	06 - 10	04 (08)
	Above 10	01 (02)
Site of work	Community pharmacist	38 (76)
	Hospital pharmacist	12 (24)

Table 2: Assessment of pharmacist knowledge about pharmacovigilance and ADR concept. (N=50)

Parameter		N (%)
Have you ever heard about the concept of pharmacovigilance?	Yes	48 (96)
	No	02 (04)
What is the definition of pharmacovigilance?	Correct	12 (24)
	Incorrect	38 (76)
What is the definition of adverse drug reaction?	Correct	36 (72)
	Incorrect	14 (28)
Knowledge about pharmacovigilance	Correct	16 (32)
	Incorrect	34 (68)
Knowledge about ADR	Correct	39 (78)
	Incorrect	11 (22)
Have you ever had a course/ attended a workshop about pharmacovigilance?	Yes	16 (32)
	No	34 (68)

Table 3: Pharmacist practices toward ADRs reporting procedure. (N=50)

Parameter		N (%)
How often do the patients report you ADRs?	More than once a week	00 (00)
	Once in 15 days	01 (02)
	Once a month	05 (10)
	A few times a year	07 (14)
	Never	37 (74)
Have the patients reported you any ADR during the last year?	Yes	12 (24)
	No	38 (76)
Do you exactly know how/where can you get the ADR reporting form?	Yes	07 (14)
	No	43 (86)
Do you report ADRs?	Yes	02 (04)
	No	48 (96)
Do you know to whom you should report the ADRs?	Yes	06 (12)
	No	44 (88)
How do you prefer to report the ADRs?	A phone call to drug company	14 (28)
	Verbally inform the representative of the drug company on routine visits	21 (42)
	Mail via internet	03 (06)
	Using adverse drug reaction reporting form	12 (24)

Table 4 : Distribution of reasons for under-reporting of adverse drug reaction. (N=50)

Parameter		N (%)
ADR reporting is not necessary	Agree	02 (04)
	Disagree	39 (78)
	Uncertain	09 (18)
ADR reporting is not mandatory	Agree	05 (10)
	Disagree	32 (64)
	Uncertain	13 (26)
ADR reporting forms are too complicated	Agree	08 (16)
	Disagree	28 (56)
	Uncertain	14 (28)
I don't have enough time to report	Agree	03 (06)
	Disagree	41 (82)
	Uncertain	06 (12)
I don't have enough clinical knowledge about it	Agree	09 (18)
	Disagree	26 (52)
	Uncertain	15 (30)
ADR reporting is the responsibility of the prescriber	Agree	13 (26)
	Disagree	19 (38)
	Uncertain	18 (36)
I avoid the professional liability	Agree	02 (04)
	Disagree	47 (94)
	Uncertain	01 (02)

Table 5: How should the adverse drug reaction (ADR) reporting rate be increased? (N=50)

Parameter		N (%)
ADR reporting training	Agree	47 (94)
	Disagree	01 (02)
	Uncertain	02 (04)
Make ADR executively mandatory	Agree	34 (68)
	Disagree	13 (26)
	Uncertain	03 (06)
Improve communication	Agree	43 (86)
	Disagree	02 (04)
	Uncertain	05 (10)
Giving feedback to ADR reports	Agree	37 (74)
	Disagree	09 (18)
	Uncertain	04 (08)
ADR reporting should be promoted	Agree	39 (78)
	Disagree	06 (12)
	Uncertain	05 (10)

Table 6: Why is adverse drug reaction (ADR) reporting important? (N=50)

Parameter		N (%)
To determine the side effects of newly marketed drugs	Agree	41 (82)
	Disagree	03 (06)
	Uncertain	06 (12)
To determine the incidence of any adverse effect in the population	Agree	40 (80)
	Disagree	03 (06)
	Uncertain	07 (14)
To determine the incidence of adverse expected effects	Agree	40 (80)
	Disagree	03 (06)
	Uncertain	07 (14)
To determine the incidence of adverse unexpected effects	Agree	41 (82)
	Disagree	02 (04)
	Uncertain	07 (14)
To determine the differences between generics	Agree	37 (74)
	Disagree	04 (08)
	Uncertain	09 (18)

VI. Conclusions

These results suggest that Bangladeshi pharmacists have little knowledge about the concept and process of pharmacovigilance and spontaneous ADRs reporting system. However the pharmacists had positive attitudes toward pharmacovigilance, but very little experience with reporting. Educational programs are needed to increase pharmacists' role and their knowledge about the reporting process and its requirements, and thus to have a positive impact on patient caring process. As evidenced in the developed countries, training will definitely help to increase the quality of reports besides the quantity of reports. As pharmacovigilance system works successfully and achieves its goals, this will contribute better patient safety and also help pharmacovigilance related other problems.

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