

Pharmacovigilance

Basic concepts and an overview of the system in Oman

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ACCORDING TO THE WORLD HEALTH ORGANIZATION (WHO), the original definition of adverse drug reaction (ADR) is “a response to a drug that is noxious and unintended and occurs at doses normally used in man for prophylaxis, diagnosis or therapy of disease, or for modification of physiological function”.¹ ADRs pose a common clinical problem and a significant cause of morbidity and mortality.² Pharmacovigilance is defined as “the science and activities relating to the detection, assessment, understanding and prevention of adverse effects or any other drug-related problem”.³

NEED FOR PHARMACOVIGILANCE

When a new medication is released in the market, information about its adverse effects becomes available, which may result in its withdrawal, restrictions in use and labelling changes. Some adverse effects are a cause of concern among healthcare professionals and the public. Data on drug efficacy and safety are usually based on the experience of thousands of people who participated in controlled clinical trials.⁴ Rare adverse events may not always be identified in clinical trials because of the lack of long-term safety data and unforeseen interactions with coexisting clinical conditions or other drug therapies.^{2,4} Risks and benefits associated with medications can be better understood only after their use by a wider group of people and monitoring for a longer period.² Characterisation of a new drug’s complete safety profile relies on clinicians’ careful observation of its effects in the ‘real world’ practice; pharmacovigilance is the observational science that helps in this process.⁴ Pharmacovigilance helps identify the safety concerns associated with medications and helps regulatory agencies or manufacturers make decisions regarding withdrawal, restrictions in use or labelling changes for medications.

PHARMACOVIGILANCE SYSTEMS AND SPONTANEOUS REPORTING

Pharmacovigilance employs various methods to monitor the safety of medications with spontaneous reporting being the most common one. Spontaneous reporting is done by people who make a connection

between a drug and a suspected drug-induced event. This data about suspected ADRs are collected in a central database.⁵ Although spontaneous reporting is critical for drug safety monitoring and should be considered a professional responsibility, under-reporting of ADRs is a limitation of current pharmacovigilance systems.² Despite the inherent limitations of spontaneous reporting, it provides crucial evidence for generating a hypothesis regarding the association between a drug and an adverse event.⁵ Carefully planned post-marketing studies and ongoing systematic evaluation using linked databases can help construct efficient pharmacovigilance systems.²

Pharmacovigilance serves as an indicator of clinical care standards that are practised within a country.⁶ Every country has its own pharmacovigilance programme due to the differences in several factors—including predominant diseases, prescribing practices, the genetic composition of the population, diet, and people’s traditions. These factors can influence the pattern, presentation and incidence of ADRs.⁷ In response to the thalidomide disaster in 1961, the WHO initiated the Programme for International Drug Monitoring (PIDM) and has an active WHO Collaborating Centre for International Drug Monitoring (Uppsala Monitoring Centre, Sweden), which promotes pharmacovigilance at the country level. The WHO programme is a worldwide collaboration of 140 full- and 30 associate-member countries and contributes towards patient safety worldwide.⁸ Safety information received from pharmacovigilance centres helps design drug utilisation practices, essential drugs programmes, standard treatment guidelines and national and institutional formularies.⁶ Regulatory authorities maintain databases of adverse event reports and analyse them systematically for new safety signals; one striking case report, an unusual pattern of adverse events or a collection of adverse event reports exceeding the expected level in usual clinical experience which might initiate a targeted and comprehensive investigation and analysis.⁴

PHARMACOVIGILANCE IN PRACTICE

A healthcare system that includes pharmacovigilance promotes the safety of medications by minimising

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ADRs' occurrence and provides a warning network of various healthcare providers, regulators, manufacturers and consumers to take remedial actions in a timely and orderly manner.⁹ The key stakeholders involved in pharmacovigilance are patients, healthcare professionals, governments and pharmaceutical companies.² Among these stakeholders, healthcare professionals play the most significant role.

Pharmacovigilance is a multidisciplinary approach that includes the collaboration of multiple disciplines such as clinicians, pharmacists, nurses and dentists. A clinician's role in handling ADRs is essential not only for patients' safety but also for drug safety monitoring at the population level.⁷ Pharmacists monitor the ongoing safety of medicines and are the most responsible members of the multidisciplinary team to establish and maintain an effective pharmacovigilance programme in a practice setting. Pharmacists provide information related to medication safety after critical evaluation.⁹ The exclusive role of nurses in pharmacovigilance is identifying ADRs, which is difficult for other healthcare providers.¹⁰ Dentists may help build a better pharmacovigilance system by adopting pharmacovigilance practices and reporting ADRs that are useful for dentistry as a whole.¹¹

Pharmacovigilance education and training in healthcare professionals helps construct a better pharmacovigilance system in clinical practice.⁶ Key pharmacovigilance aspects should be integrated into existing programmes as well as courses for medical, pharmacy, dentistry and nursing education.¹² Although basic knowledge about ADRs can be acquired through undergraduate pharmacology textbooks and curricula, additional educational efforts are needed to inculcate the habit of drug safety and pharmacovigilance among medical students.^{2,7} These students should be trained so that they could be able to report ADRs in their area.⁷ Competence in handling ADRs in clinical practice is also important for drug safety monitoring at the population and individual patient levels.¹² Healthcare professionals should possess the skills required to critically evaluate drug information and decide how a drug's safety profile might be applied to a particular patient.⁶ Educating and training healthcare professionals and linking the clinical experience of drug safety with research and health policies can enhance effective patient care.⁹

PHARMACOVIGILANCE SYSTEM IN OMAN

To address the need for an effective system for routine drug safety monitoring and to ensure public health protection in Oman, the Ministry of Health (MOH) joined the WHO PIDM in 1995.^{13,14} The background

activities were initiated in the International Communication Section under the Drug Control Department and all healthcare professionals working in both government and private sectors in Oman were involved in the programme. In 2015, the Department of Pharmacovigilance and Drug Information (DPVDI) was established as the National Pharmacovigilance Centre (NPVC), following a restructuring of departments in the MOH, Oman. Pharmacovigilance activities in DPVDI are based on the Directorate General of Pharmaceutical Affairs and Drug Control in the MOH [Figure 1]. DPVDI also collaborates with international stakeholders, such as the WHO and the Uppsala Monitoring Centre (UMC), Sweden, for matters related to the safety of medicines.

There are 34 regional pharmacovigilance centres and 80 sub-regional pharmacovigilance centres functioning under the NPVC in Oman. The ADR reporting algorithm of the Omani NPVC is depicted in Figure 2.¹⁵

The total number of ADRs reported at the NPVC in the initial years of the ADR monitoring programme was limited; however, it increased through constant awareness programmes, workshops and training focused on healthcare professionals at regional and institution levels. The total number of reports submitted to the UMC in 2019, 2018 and 2017 were 2,472, 1,703 and 2,196, respectively. The DPVDI was instrumental in developing guidelines such as the Guideline on Good Pharmacovigilance Practices in Oman, Guide for Reporting Adverse Drug Reactions and Quality Problems, Guide for Direct Healthcare Professional Communications and a Supplement to Chapter 11 that focused on Marketing Authorisation Holders and pharmaceutical manufacturing companies.^{15,16} These guidelines will facilitate the activities related to pharmacovigilance within the country.

Pharmacovigilance is an ongoing process during medication use and is an essential component of clinical practice that promotes safe medication use through prevention, identification, analysis, management and documentation of adverse effects and drug-related problems. Stakeholders involved in pharmacovigilance include patients, healthcare professionals, drug manufacturers and regulatory agencies. A multidisciplinary approach with healthcare professionals such as pharmacists, clinicians, nurses and dentists is essential for developing an effective pharmacovigilance system. Teaching pharmacovigilance aspects to future healthcare professionals as a part of their curriculum will ensure effective use of these aspects during clinical practice. Although Oman is a part of the global pharmacovigilance for several years and has an active pharmacovigilance system, continuing awareness and

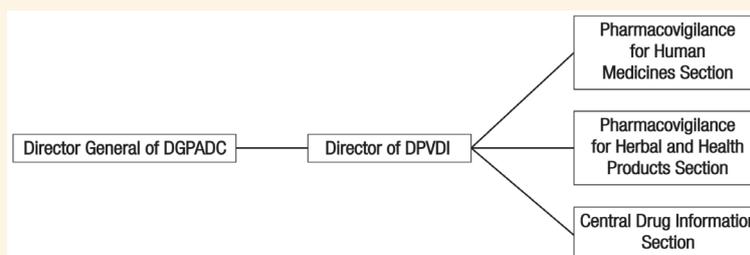


Figure 1: Organisational structure for pharmacovigilance activities in Oman.

DGPADC = Directorate General of Pharmaceutical Affairs and Drug Control; DPVDI = Department of Pharmacovigilance and Drug Information.

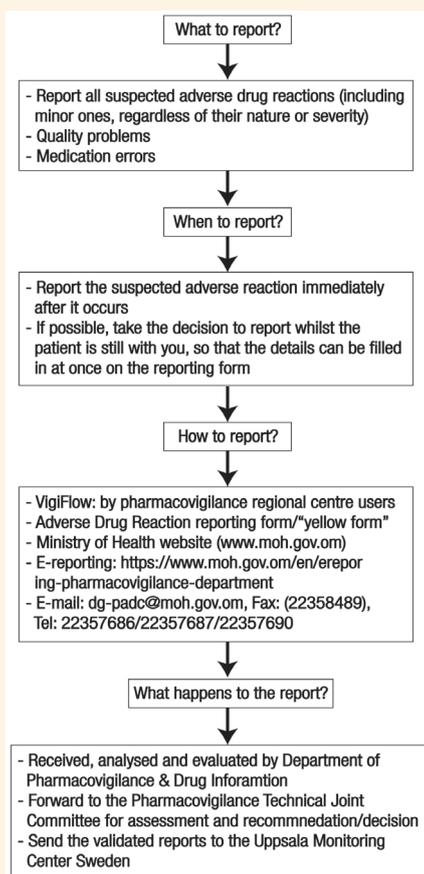


Figure 2: Adverse drug reactions reporting algorithm of the Omani National Pharmacovigilance Centre.¹⁵

training programmes for healthcare professionals are required to develop an effective system and make it a part of patient safety.

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