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PHARMACOVIGILANCE: AN OVERVIEW

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ABSTRACT

Pharmacovigilance is defined by WHO as the science and activities relating to the detection, assessment, understanding and prevention of the adverse effects of drugs or any other possible drug-related problems. Adverse drug reactions (ADRs) are ranked as the top 10 leading causes of mortality and morbidity in the world. Pharmacovigilance is concerned about evaluating and monitoring the safety of medicine in clinical practice to improve patient's safety. Pharmacovigilance promotes safety and efficacy of the drug. The preliminary essential steps of pharmacovigilance is the reporting of suspected adverse drug events. PV evidence of medicine related problems like poor quality drugs, treatment failure, drug interaction. The Pharmacovigilance exertion in India is organized by The Indian Pharmacopoeia Commission and conducted by the Central Drugs Standard Control Organization (CDSCO). The fundamental aim of PvPI is to collect data, method, analyze it and provide necessary interventions to Health care professionals to minimizing the potential risks associated with the drug or blood and blood products. Pharmacists contribute to the drug safety by preventing, identifying, documenting, and reporting of ADRs.

KEYWORDS: Pharamacovigilance, adverse effects, importance, PvPI.

INTRODUCTION

Pharmacovigilance is defined by WHO as the science and activities relating to the detection, assessment, understanding and prevention of the adverse effects of drugs or any other

possible drug-related problems.[1] Adverse drug reactions (ADRs) is defined as any reaction to a drug that is noxious, unintended, and which occurs at doses which is normally used as prophylaxis in human, diagnosis or therapy of disease or for the modification of a physiological function.[4] Adverse drug reactions (ADRs) are ranked as the top 10 leading causes of mortality and morbidity in the world. Pharmacovigilance is concerned about evaluating and monitoring the safety of medicine in clinical practice to improve patient's safety.[5]

Pharmacovigilance promotes safety and efficacy of the drugs by a) the early detection of unknown ADRs and interactions b) to assess the benefit, harm, effectiveness and risk of medicine c) to improve the understanding, education and training to the health professionals and the public.[2] The preliminary essential steps of pharmacovigilance is the reporting of suspected averse drug events. The adverse reactions which can arise from: use of approved drug, overdose or off label use, medication error, occupational exposure.[8] The under-reporting of adverse drug reactions is a intimidate task in pharmacovigilance.[7] A serious adverse event (SAE) is any unwanted medical experience at any dose in which :

- Results in death
- ls life-threatening
- Results in significant disability
- Is a congenital anomaly/birth defect
- Prolongation of existing hospitalization[9].

The Pharmacovigilance exertion in India is organized by The Indian Pharmacopoeia Commission and conducted by the Central Drugs Standard Control Organization (CDSCO).[9] To execute the Pharmacovigilance the complete understanding of safety reporting and postmarketing surveillance that promote rational and safe use of medicine. The main aim of pharmacovigilance is to improve the patient's safety and care, assesment of benefit, harm & effectiveness of medicine. It identify patient related risk factors of ADR and to promote education & clinical trials.[12] The major challenges are globalization, web-based sales and information, broader safety concerns, public health versus pharmaceutical industry economic growth, monitoring of established products, developing and emerging countries, attitudes and perceptions to benefit and harm, outcomes and impact.[6] Pharmacovigilance involves consumers, health care professionals (HCPs), pharmaceutical companies, and global regulatory agencies, each of whom plays a unique and critical role in this process.[3]

Healthcare professionals play a significant role in the pharmacovigilance system. They require considerable knowledge and expertise in the field of medication safety which will successfully contribute to this area through early recognition, management, and reporting of the adverse effects.[13]

AIM

Thalidomide tradedy evidence the importance of effective drug monitoring system. The main aim of pharmacovigilance includes:

- Improvement of patient care and safety in relation to the use of medicine thereby enhance public health and safety.
- It assess the benefit, harm, effectiveness and risk of medicines that propagates the needful information to facilitate proper drug prescription and regulation.
- It provides the effective communication to health professionals and the public by strengthen the education, knowledge and clinical trials in pharmacovigilance.
- Early detection of unknown ADR and interaction and also identify the increase in the frequency of know adverse effects and their risk factors.[5]

IMPORTANCE OF PHARMACOVIGILANCE

The Pharmacovigilance ensures patient safety throughout the development of drug and also after the drug reaches the market. It is used to identify the adverse effects of drug that enables the wellbeing of public. It provides evidence of medicine related problems like poor quality drugs, treatment failure, drug interaction. Promote safety to vulnerable groups such as Pregnant women & breastfeeding mother, elderly, young children.[1]

Drug Regulation

A new medicine must pass three hurdles before its approval by the national drug regulatory authority. Sufficient evidence is required to show the new drug to be

- Of good quality,
- Effective, and
- Safe for the purpose or purposes for which it is proposed.

A. *Cl inical Trial Regulation*

For drug regulators, the changing trends over recent years in the conduct of clinical trials present special and urgent challenges, particularly in ensuring that the rights and health of patients and their communities are protected. As the increasing complexity of clinical trials

presents further challenges to regulators that results in increased number of study designs.[10] Local ethics committees and drug regulators are not always aware of patients and investigators experiences. This may affects the safety of patients and therefore Safety monitoring during clinical trials is considered as one of the major concerns for new drug development. This is currently being addressed by a CIOMS working group and it results in:

1) The collection of adverse experience information
2) Assessment/monitoring of clinical data
3) Reporting/communication of clinical data[5,1]

B. *Post-marketing safety monitoring*

The stronger the national system of pharmacovigilance and ADR reporting, the more likely it is that reasonable regulatory decisions will be made for the early release of new drugs with the promise of therapeutic advances. It plays an important role in the introduction of generic medicines, and in review of the safety profile of older medicines already available, where new safety issues may have arisen. Post marketing safety monitoring stimulate the • Detection of drug interactions • measuring the environmental burden of medicines used in large populations • assessing the contribution of 'inactive' ingredients (excipients) to the safety profile • systems for comparing safety profiles of similar medicines • surveillance of the adverse effects on human health of drug residues in animals, e.g. antibiotics and hormones[1,2]

C. *Promotional activities*

Promotional activity issues suggest the requirement for more thorough monitoring of drug safety and scrutiny of advertizing. Resources and expertise are necessary to ensure that promotional materials contain accurate and balanced information, and that practices are ethical. The involvement of regional or international collaboration in the implementation of a regulatory code of practice for advertizing medicinal products would help the situation.[11]

D. *International harmonization of drug regulatory requirements*

Harmonization activities related to drug regulation are being pursued in all WHO regions. The ICH initiative, which started in 1990, is an inter-regional venture covering seventeen high-income countries. This helps to increase the global trade in pharmaceutical products and the growth in complexity of technical regulations related to drug safety and quality.[1]

E. ***Pharmacovigilance and the national drug regulatory authority***

The ultimate aim of National drug regulatory authority is to ensure the quality, safety and efficacy of all marketed products across the country. It includes:

- Promoting medicine safety by collecting and managing reports of ADRs, medication errors, and suspected substandard products.
- Collaborating and harmonizing with existing ADE reporting and collection activities within the country (e.g., national disease control programs, Ministry of Health) as well as international cohorts monitoring ADEs in defined patients or populations.
- Identifying safety signal (e.g., unknown or poorly characterized adverse events) in relation to a medicine or a combination of medicines.
- Undertaking a risk assessment and developing options for risk management.
- Identifying quality problems with medicines resulting in ADEs and supporting the identification of medicine quality issues in general.
- Providing effective communication on aspects of medicine safety, including prompt notification of confirmed safety and quality problems and dispelling unfounded rumors of toxicity attributed to medicines and/or vaccines.
- Applying PV information for the benefit of public health programs, individual patients, and national medicine policies and treatment guidelines.
- Developing and maintaining drug utilization information
- Identifying issues associated with inappropriate prescribing and dispensing of medicines[14]

F. ***Promoting communication in the field of drug safety***

For the communication of adverse reactions or any other safety finding to regulators, health professionals and patient. Pharmacovigilance provide significant ability and resources to evaluate and make suggestion on drug safety and efficacy .The major challenges for National centers, is to promote and maintain effective and open communication of information regarding the benefit, harm, effectiveness and risk of medicines, including the uncertainty of knowledge in this area, with the public and the health professions. The 1998 Erice Declaration on Communicating Drug Safety Information called for a united effort on the part of all interested parties in establishing a new culture of transparency, equity and accountability in the communication of drug safety information.[1,15]

G. *Risk and crisis management*

World Health Organization (WHO) defines a crisis as any unplanned event or succession of events which lead to interruption or destabilization of the normal operations or activities of an organization.[18] Prevention of occurring drug safety problems is an essential section of drug safety crises management. This could be useful for reducing drug related morbidity and mortality.[16] Risk Management Plans(RMP) and Risk Evaluation and Mitigation Strategies(REMS) are now a standard part of pharmacovigilance planning. The aim of both the RMP and the REMS is to reduce the risks related to a medicinal product through interventions and to disseminate those risks to patients and healthcare providers. Medication guides, a detailed communication plan about safety issues, specific elements to assure safe use of a product such as required laboratory testing or prescriber training, an implementation plan and a timetable for assessment.[17]

H. *Herbal and Traditional Medicines*

Misuse of the wrong species of medicinal plants, inappropriate dosing, errors in the use of herbal medicines by healthcare providers and consumers, interactions with other medicines results in Adverse effects. The purpose of pharmacovigilance is to detect, assess, and understand, and to prevent the adverse effects or any other possible drug-related problems, related to herbal, traditional, and complementary medicines. In order to provide consistency in the naming of herbs in adverse reaction (AR) reports, the WHO Collaborating Centre for International Drug Monitoring has recommended the use of proper scientific binomial names for herbs used in medicine, including the use of such names (where this information is available) in the coding of AR reports. This will assure the comparability between reports from various international pharmacovigilance databases. To handle herbal medicines and, in particular, to analyze the causes of adverse events, the national pharmacovigilance centers (or equivalent institutions) will include trained personnel in the relevant technical areas and facilities to analyze the products concerned, for which there is often insufficient information and lack of access to reliable information support.[19,20,21]

I. *Vaccines and biological medicines*

Vaccine pharmacovigilance is defined as “the science and activities relating to the detection, assessment, understanding, prevention, and communication of Adverse Events Following Immunization (AEFI) or of any other vaccine or immunization-related issues. Vaccines and biologicals require modified systems of safety monitoring as they are often administered to

healthy children. The efficient regulation of these products is crucial in order to avoid potential harm to the public as a result of substandard manufacture or improper transportation and storage of imported vaccines and biologicals. The strengthening of pharmacovigilance is very important because it helps professional health care workers to avoid the problems with immunization, protect the health of people from adverse events during immunization.[22,23]

Pharmacovigilance Programme In India

Pharmacovigilance Programme of India (PvPI) The Central Drugs Standard Control Organization (CDSCO), Directorate General of Health Services under the aegis of Ministry of Health & Family Welfare, Government of India in association with Indian Pharmacopeia commission, Ghaziabad is initiating a nation-wide Pharmacovigilance Programme for protecting the health of the patients by promising drug safety. The Programmes shall be coordinated by the Indian Pharmacopeia commission, Ghaziabad as a National Coordinating Centre (NCC). The center will operate under the supervision of a Steering Committee. The Pharmacovigilance Programme of India (PvPI) was started by the Government of India on 14th July 2010 with the All India Institute of Medical Sciences (AIIMS), New Delhi as the National Coordination Centre for monitoring Adverse Drug Reactions (ADRs) in the country for safe-guarding Public Health.[9,19]

PvPI is one of the integral part of safety program. The fundamental aim of PvPI is to collect data, method, analyse it and provide necessary interventions to Health care professionals to minimizing the potential risks associated with the drug or blood and blood products or medical devices thereby it ensures the safety of public. The main objectives of PvPI includes:

1) To create a nation-wide system for patient safety reporting.
2) To identify and analyze the new signal ADR from the reported cases.
3) To analyze the benefit - risk ratio of marketed medications.
4) To generate the evidence-based information on safety of medicines.
5) To support regulatory agencies in the decision-making process on use of medications.
6) To communicate the safety information on use of medicines to various stakeholders to minimize the risk.
7) To emerge as a national centre of excellence for pharmacovigilance activities.
8) To collaborate with other national centres for the exchange of information and data management.

9) To provide training and consultancy support to other national pharmacovigilance centres located across globe[5]

CHALLENGES

The major challenge of PVPI is the underreporting of adverse effects and the factor such as heavy workload of health care professionals, lack of medical expertise in drug administration and inadequate nationwide awareness of PV. Another challenge for PvPI is that pharmacists need to be empowered to enhance ADR reporting. The infrastructure, wide time interval between guidelines and laws, conservative approach to new drug research, and PV and absence of proper regulatory inspections, inproper medical training are affecting the function of PV. Drug use problems such as wide spread use of injections, high levels of antibiotic use, inadequate treatment guidelines, poor prescribing and dispensing practices and using of herbal & traditional medicines. And also diseases like tuberculosis, HIV/AIDS, malnutrition requires multiple drug therapy and adverse event occurs due to drug interactions and can lead to severe health hazard. The PV system needs to be refined with the help of PV experts in collaboration with information technology.[29-32]

ROLE OF PHARMACIST

- Effective and safe pharmacological treatment process requires a team work of the patient and healthcare professionals. Pharmacists and nurses plays a crucial role in monitoring and identification of drug related problems; thus maintain safe use of medicines.
- Pharmacists contribute to the drug safety by preventing, identifying, documenting, and reporting of ADRs.
- To promote rational use of medicines by identifying whether the patients receive medicines appropriate to their clinical needs, in doses that meet their own individual requirements, for an adequate period of time, cost effective etc.
- Pharmacist plays a vital role in medication safety monitoring.
- Pharmacists can assure a positive environment to the patients in minimizing the medication errors, improve patient safety and quality of life during the counselling session.
- Developing communication materials like newsletters and other publications through the drug information and poison centres, whichare utilized by the health care professions.[33-36]

CONCLUSION

Pharmacovigilance act as a safeguard to the public health regarding the use of medicine. PV promotes medicine safety by collecting and managing the ADRs, medication errors. It ensures quality, safety and efficacy of all marketed products. It plays an important role in drug regulation as it collects adverse event information, assessment of clinical data and reporting of clinical data. PV monitors post marketing surveillance and the safety use of herbal & traditional medicines and vaccines. Pharmacovigilance programme in India will collect data, method, analyze the adverse effects and make necessary interventions to minimize the risks related to the medicine. The major challenge of PvPI is the underreporting of ADR. Pharmacist promote rational use of drugs by monitoring, identifying and evaluate the ADR and other drug related problems. Pharmacist provides communication materials to the health care professional and public.

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CONFLICT OF INTEREST

We declare that we have no conflict of interest.

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