

## PROSPECTIVE FEATURES OF PHARMACOVIGILANCE

Damal Rahul Ramesh<sup>1</sup>

<sup>1</sup>Shri Amlok Jain Vidya Prsarak Mandal's College Of Pharmaceutical Science And Reaserch Centre Kada, India.

### ABSTRACT

Pharmacovigilance play an important versatile role in the healthcare system through monitoring and interaction of drugs and there effects in the human body. Pharmacovigilance are integral part of clinical trials. Pharmacovigilance “is defined as the pharmacological science concerned with the identification assessment, understanding and prevention of side effects, particularly long-term and short-term adverse drug reactions. This is about what exactly pharmacovigilance is. What we know about the benefits, risks, challenges and future of pharmacovigilance in Indian medicine here the focus is on the objectives and role of pharmacovigilance in regulating medicines and their partners. In this article includes good manufacturing practices (GMP) and (ICH) guidelines for pharmaceuticals for human use are examined as an important aspects in the transformation of clinical trial to the objective of pharmacovigilance In pharmaceutical production India becomes third largest country in the world.Pharmacovigilance promotes the appropriate and safe use of medications. Pharmacovigilance essentially sheets safety of medicine. Pharmacists have key roles in wellbeing frameworks to keep up the reasonable and safe utilization of medicine for they are medicate specialists who are unequivocally prepared in this field.The safety concern of drug is now becoming the priority area. The drug safety issues were globalised, strength and systematized after the establishment of World Health Organization (WHO) Programme for International Drug Monitoring in 1968. Appropriate and effective monitoring of ADRs, i.e. pharmacovigilance, is the only best way to safeguard the public health. Spontaneous reporting system (SRS) are first and most widely used method to report ADRs in spite of under-reporting as a major limitation. In this article includes good manufacturing practices (GMP) and (ICH) guidelines for pharmaceuticals for human use are examined as an important aspects in the transformation of clinical trial to the objective of pharmacovigilance In pharmaceutical production India becomes third largest country in the world.Nowadays in India pharmacovigilance gives awareness about adverse drug reactions (ADR) this review gives information about implementation for solving current problems. This article summarized objective and Date 2024-02-14 Words 340 Characters 2666 Page 1 of 2 methodology used in pharmacovigilance with their review of existing in India and their challenges and future major problem

**Keyword:** Safety, efficacy, pharmacovigilance, clinical research, drug security, Adverse drug reaction, prevention, medicine.

### 1. INTRODUCTION

The latin term pharmacovigilance in dissociate in two word pharmacon mean,s- drug & vigilance mean,s- to watch or to monitre . pharmacovigilance is term from the drug body interaction,drug-drug interaction & drug food interaction.pharmacovigilance are the basement of to prevent unwanted,undesire effect on human body from drug from the drug.every drug show therapeutic use or pharmacological action in human body with same side effect or unwanted effect then prevent unwanted effect of drug by using supervision of drug from intake in human body , that's concept is called as pharmacovigilance. Pharmacovigilance as per WHO pharmacovigilance has the science & activities relating to their detection, assessment, understanding & prevention of ADR effect. as per the europian commission pharmacovigilance as the process & science of monitoring the safety of medicine & taking the action to reduce the risk & increase the benefit of medicine.The main aim of pharmaceutical company is innovate new drugs in market, the company has to conduct clinical trials as per ICH GMP guidelines .pharmacovigilance are integral and important part of clinical trials. “The assessment of the risks and side effects potentially associated with drug. Pharmacovigilance is a very important and integral part of clinical research. According to one definition, an ADR is "an appreciably harmful or adverse reaction, resulting from an invention related to the use of a medicinal product, which predicts risk from future administration and prevention or specific treatment, or alteration of the dosage regimen, or withdrawal of the product. It is an important component of pharmacovigilance, contributing to better evaluation of the risk-benefit profiles of medicines and evaluating ADR reports in early warning systems and for regulatory purposes. Phase refers to the four phases of clinical research and development: I – small safety trials early on in a drug's development; II – medium-sized trials for both safety and efficacy; III – large trials, which includes key (or so-called "pivotal") trials; IV – large, post-marketing trials. Pharmacovigilance is the science activities related to the detection, assessment, understanding or prevention of adverse reaction or any other possible drug-related problems. Spontaneous reporting system of adverse events and adverse drug reactions is the common method utilized for generating safety data. The

studies related to pharmacovigilance indicate then what are the possible risks associated with the medicine. Even drug can be associated with possible adverse reactions, intended or unintended.

## 2. AIMS OF PHARMACOVIGILANCE

1. To improve the patient care.
2. To provide medicine & all medical with para medical service safe.
- 3 nn.To improve public health service.
4. Promote the rational and safe use of medicines.
5. Promote clinical education and training.
6. Pharmacovigilance monitors any severe side effects of medications.
7. The identification of important drug-drug interactions in co-therapy and novel products.
8. The identification and quantification of previously un-recognized adverse drug reaction (ADR).
9. The detection of inappropriate prescription administration.
10. The identification of sub-groups of patients at particular risk of ADRs (the risk relating to dose, age, gender and underlying disease).

### HISTORY & DEVELOPMENT OF PHARMACOVIGILANCE /HISTORICAL BACKGROUND OF PHARMACOVIGILANCE:

The safety of drug was not the early concern in the history of drug. The thalidomide tragedy of 1960's opened the eyes of drug regulations as well as other concern healthcare professionals to establish a way to ensure drug safety<sup>1</sup>

The mile stone in the drug safety was the publication of chloroform related death on The Lancet journal for the first time in 1893 . Onwards, safety of drug became the global concern and different initiatives were taken by different country to safeguard the public health safety.

The US Federal, Food and Drug (FDA) act was passed in 1906 for the first time, but it was proposed to control misbranding of ingredients and false advertising claims after the deaths associated with sulphanilamide elixir

There were 107 death by the use of diethylene glycol as a solvent for sulphanilamide elixir. There were radical changes in the drug safety issues after the worldwide thalidomide tragedy which was first reported by an Australian obstetrician, William McBride in 1961

He reported thalidomide associated "seal limbs" in the baby, used in pregnancy. This drug had not been adequately screened for teratogenic effects, but similar malformations were subsequently shown the rabbit and (at high dose) to the rat.

In West Germany 4000 individuals were affected. The tragedy made the world to be more concern about the drug safety, as efficiency was first parameter to see the effect of drugs. Immediately after the tragedy the US FDA act was amended to compulsory premarketing submission of both efficiency and safety data in 1962

The UK Medicines act was enforced in 1968, however, safety monitoring via "yellow card system" was introduced in 1964

The drug safety issues were globalised, strengthen and systematized after the establishment of World Health Organization (WHO) Programme for International Drug Monitoring in 1968

The Uppsala Monitoring Centre (UMC) located at Uppsala, Sweden co-ordinates the International Drug Monitoring program. Till now there are 104 official member countries and 33 associate members throughout the world, including developed, developing and under-developed country 6 . Year Events 1747 was first reported clinical trials by James Lind, proving the effectiveness of lemon juice in preventing scurvy

1937 Death of 107 children due to sulfanilamide toxicity. 1950 Aplastic anemia reported due to chloramphenicol.

1961 Global disaster due to thalidomide toxicity.

1963 16th first World Health Assembly recognize important to rapid action on ADR.

1968 (WHO) commercial research project for international drug monitoring.

1996 Clinical research of global standards started in India joined WHO Adverse Drug Reaction Monitoring programme.

1998 Pharmacovigilance started in India. 2002 67th National Pharmacovigilance Center established in the India.

2004 National Pharmacovigilance Program launched in India. 2005 Conduct of structured clinical trials in to the India.

2009-2010 PVPI Initiated.

---

#### STEP IN PHARMACOVIGILANCE PROGRAM / PROCESS :

1. Pharmacovigilance Process (Stage 1): Detection. - Collection of Individual Case Safety Reports (ICSRs)
2. Pharmacovigilance Process (Stage 2): Assessment.
3. Pharmacovigilance Process (Stage 3): Understanding the drug safety profile.
4. Pharmacovigilance Process (Stage 4): Prevention of adverse effects.

#### IMPORTANCE OF PHARMACOVIGILANCE :

1. Complete safety data (especially for unexpected and serious adverse events) can only be captured through pharmacovigilance
2. It cannot be captured through clinical trials which are conducted in an "artificial environment.
3. Safety monitoring of medicinal products.
4. Product surveillance, Post marketing.
5. Adverse drug reaction reporting.
6. Legislation.
7. Pharmacovigilance supports safe and appropriate use of drugs.
8. Pharmacovigilance is the science and activities relating to the detection, assessment, understanding and prevention of adverse effects or any other medicine/vaccine related problem.

### 3. ROLE OF PHARMACOVIGILANCE

Pharmacovigilance has been widely accepted to Possess a significant role in early observation of The risk associated with the drug. All the Medicines are tested on a concerned small ratio Of population before it is approved for post Marketing surveillance. The pharmacovigilance are known to possess various roles like, Identification, quantification and documentation Of drug-related problems; contribution towards Reducing the risk of drug-related problems in Healthcare systems; and enhancement of Knowledge and understanding of factors and Mechanisms which are responsible for drugRelated injuries. [6] However, in order to fulfill Various roles of pharmacovigilance, the Interactions and influence of many stakeholders In society with decision-making powers has been Required, which include, politicians at national, Regional and local levels; healthcare Administrators; drug regulatory authorities; Pharmaceutical companies; healthcare Professionals like physicians, dentists, Pharmacists and nurses; academic institutions; Media representatives; health insurance Companies; lawyers; and patient group.

#### ADVERSE DRUG REACTION:

Adverse drug reactions (ADRs) are common, often unrecognised and typically under-reported. However, update knowledge and skills related to detection, assessment, prevention, management and transparent notification / reporting of ADR is essential for an efficient Pharmacovigilance every where on the globe. Classification of adverse reactions : # Type A: Augmented pharmacologic effects. #Type B: Bizarre / Idiosyncratic effects. # Type C: Chronic effects. # Type D: Delayed effects. #Type E: End-of-treatment effects. # Type F: Failure of therapy. \* SIDE EFFECT : event secondary to the therapeutic effect which may actually be beneficial. \_ Side effects, also known as adverse reactions, are unwanted undesirable effects that are possibly related to a drug. \_ Unwanted or Unexpected Drug Reactions.

#### MONITORING OF ADRs:

The process of continuously monitoring adverse drug reactions (ADRs) is known ADRs monitoring. Pharmacovigilance is crucial to the role of ADR monitoring, If any of the adverse events are not disclosed, the therapeutic products have unpleasant and detrimental effect. Thus carrying out ADR monitoring programmes correctly will contribute to minimising the negative effects of medicinal drugs. Benefits of ADR monitoring It provides details on the reliability and security of medicinal product. Plans for risk management are started. It aids in measuring ADR adherence and prevents the predictable adverse effects. It raises awareness of adverse drug reactions and educates the health care team, including patients, pharmacists, and nurses, about adverse drug reactions. ADR monitoring's primary goals are to detect the risk variables that can result in adverse reactions, as well as to disclose the kind, quantity, and frequency of ADRs.

#### FACTORS OF ADR REPORTING:

Adverse drug reactions have emerged as a noteworthy clinical and general medical issue responsible for around 5 to 35% of healing center confirmations in both created and creating nation. In the US and EU, adverse drug reactions are among the main ten reasons for fleeting ness and in addition rising the expense of consideration. Fast revealing of ADRs to medicate administrative bodies is a critical medication safety check yet under-detailing is a noteworthy test even in created nations with satisfaction human and material assets to stand up to the issue.9 Variables that may add to

underreporting among HCPs incorporate learning, carelessness, absence of time and drive. Absence of institutionalized revealing procedures and holes in human services data frameworks additionally causes underreporting. 10 Studies recorded ADEs in outlines to help dauntlessness of consideration however never announced them to outside organizations. Suppliers confronted time imperatives and detailing would have required duplication of documentation. Reviews of human services suppliers in intense healing centers have discovered that medical caretakers are bounded to report episodes than specialists and that there are different subtleties for staff not revealing, including not realizing report events, time, limitations, vulnerability about what to report, the desire for fault or discipline and a discernment that detailing occurrences does not result in enhancements.

#### POSSIBLE MECHANISMS OF ADRS:

Abnormal pharmacokinetic mechanisms due to • Genetic factors • Abnormal drug metabolism may be due to included factors of other different Phase I oxidation or Phase II conjugation

- Phase I: inheriting abnormal alleles of Cyp450 can alter drug metabolism; inheriting abnormal pseudocholinesterase may affect metabolism of drugs like succinylcholine
- Phase II: inheriting abnormal N-acetyltransferase which conjugated some drugs to facilitate excretion they affect the metabolism of INH, hydralazine, and procainamide
- Comorbid disease states: Various diseases especially those that cause renal or hepatic insufficiency may alter drug metabolism.
- Counterfeit drugs
- Pharmacodynamic mechanisms due to synergistic effects between
- A drug and a comorbid disease state
- 2 drugs given simultaneously

#### Major challenges in pharmacovigilance:

Pharmacovigilance facing the problem in healthcare delivery system because of not getting priority. Buisness of drug in healthcare delivery system is also big issue . Poor staffing, poor funding and mostly political pressures creating barrier in implementing of pharmacovigilance programme. Other challenges are associated with health professionals are few in number but many prescriber. Lack of continuing medical education and difficulties in availability of drug information is another big issue. Some drug use problems contributing to the barriers in pharmacovigilance programme in India are availability of many types of drugs in households and dispensing the drugs by untrained persons Some other drug use problems are wide spread use of injections, high levels of antibiotic use, improper treatment guidelines, poor prescribing 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. Due to the above reasons risk of adverse drug reaction events are very highly. So following challenges can be avoided by implementing proper rule and regulation of pharmacovigilance programme strictly overall. Improvement of communication regarding pharmacovigilance between public health professionals creates awareness and adverse occurring can be minimized. Proper knowledge of pharmacovigilance are help to health professionals to understand the effectiveness or risk of medicines that they prescribe and ensure a better healthcare to patient.

#### 4. APPLICATION

Pharmacovigilance in Clinical Practice : Safe monitoring of medicines in common use should be an integral part of clinical practice. The degree to which physicians are informed about the principles of pharmacovigilance and practice according to a large impact on the quality of health care. Education and training of health professionals in drugs safety. exchange of information between national pharmacovigilance centers, the coordination of such exchange and the linking of clinical experience of drugs safety with research and health policy. all serve to enhance effective patient care problem. A regular flow and exchange of information this way means that national pharmacovigilance programmers are ideally placed to identify gaps in our understanding of drugs-induced diseases. Pharmacovigilance in disease control health programme: The monitoring of medicine safety in countries where there is no safety monitoring system in place of any health care vigilance or infrastructure, has been identified as a matter for concern problem. The problems are especially apparent that situations that involve the use of medicines in specific communities, for example: for the treatment of tropical diseases such as malaria, leishmaniasis and schistosomiasis and for the treatment of HIV/AIDS and tuberculosis. Pharmacovigilance that are priority for country with a public health services control programme.

#### GOOD PHARMACOVIGILANCE PRACTICE:

Risk assessment and risk minimization form food drug administration (FDA) calls risk management. It is an iterative process

- Making adjustments as appropriate to the risk minimization tools to further improve the benefit-risk balance.
- Evaluating tool effectiveness and reassessing the benefit-risk balance.
- Assessing a product's benefit-risk balance.
- Good pharmacovigilance practices (GPP) are a set of measures drawn up to facilitate the performance of pharmacovigilance in the European Union (EU).
- GPP apply to marketing-authorisation holders, the European Medicines Agency (EMA) and medicines regulatory authorities in EU Member States.
- They cover medicines authorised centrally via the Agency as well as authorised medicine at national level.

## 5. NEED OF PHARMACOVIGILANCE

It is widely accepted that clinical drug development is a complex and time-consuming process. Once a drug is brought to market it leaves the safe or economic environment of clinical trials and becomes available for free consumption to the general public. At this time, the safety and effectiveness of most medications are only tested in the short term on a limited number of carefully selected people.

It is therefore necessary to introduce pharmacovigilance, in particular to ensure the early detection of new adverse reactions or subgroups of patients with exceptional susceptibility; and take measures to manage these risks. In addition, it is important that new and medically evolving treatments are monitored once they come to market to determine their effectiveness and safety in practice. In addition, more data are generally needed on use in specific population groups such as children, pregnant women and the elderly, as well as on the effectiveness and safety of chronic use in combination with other drugs. Subsequently, numerous adverse events, drug interactions, and risk factors were reported during the years of drug introduction.

### Jobs in pharmacovigilance :-

There are a number of job roles that are within drug safety, each with various tasks and levels of responsibility. Exact duties will depend on environment you are working within the pre-approval or post-approval stages of pharmacovigilance, and the type of company you are employed by. Some roles you might want to consider include: PV Associate – a many more entry level role that involves providing support in all administrative aspects of safety information, including capturing adverse event information and entering data from trials. PV Support – usually responsible for supporting the collection and tracking of pharmacovigilance requirements as well as interacting with vendor to support the handover of PV activities. PV Manager – generally prefer the role of project manager, provides advice on PV strategies and coordinates regulatory documents for products. PV Specialist / Scientist – involves monitoring and processing incoming safety data from various sources, entering data and providing information to marketing partners/third-party partners. Clinical Scientist – a medical and healthcare professional who supports other clinical staff in their work with patients.

Their work is very broad and can include laboratory and testing work, research and management. Clinical Research Associate – plans, prepares and carries out clinical trials in order to test new or existing drugs and measure their safety and benefits of use. Clinical Data Manager – responsible for ensuring that statistical information and results from clinical trials are recorded and reported accurately, both during and after they are complete

### The future of pharmacovigilance :-

The pharmacovigilance field is constantly evolving and adapting to changes in the healthcare problem. The future of pharmacovigilance will continue to be driven by advances in technology, changes in the regulatory environment, and the increasing global nature of drug development and drug use. Technology will continue to play a major versatile role in shaping the future of pharmacovigilance. The commercial of big data and real-world data are provide new opportunities for more effective and efficient monitoring of drug safety. New analytical methods, such as machine learning, will allow for a most complicated analysis of data, And mobile health technologies will enable patients and healthcare providers to report adverse events more easily and quickly. The regulatory environment is also likely to change in the coming years.

The European Union's new Clinical Trials Regulation, which is pass into effect in 2020, will have a major impact on clinical trial conduct and data sharing. In addition, the FDA is considering new regulations. that would require sponsors to submit electronic medical records for certain drugs undergoing post marketing studies. These changes could have a significant impact on the Future of Pharmacovigilance. Finally, the globalization of drug development and use will continue to present challenges for pharmacovigilance. As more drugs are developed and used internationally, it becomes increasing difficult to track safety information across borders. This challenge is surrounded by the fact that, oftentimes, different countries have different regulations regarding adverse event reporting.

## 6. CONCLUSION

The Indian pharmaceutical industry is the third largest industry next to number Overall, but thanks to concepts like pricing it is also the 13th . Mainly the real economy itself is controlled , even branded generics Which account for almost 70- 80% of both sectors . Therefore, a typical quality management system is required to both monitor the harmful effects of substances and ensure the health of the consumer. Despite all the efforts outside Cisco, an organization such as a global quality management system in the country overcome many difficulties that need to be overcome, from successful implementation, prevention and control to the lack of knowledge on the part of many pharmacies, care Staff, patients and professionals struggling with absenteeism, for example when reporting side effects, However increased awareness and training of public health services and medical professions, facing of strong regulations for reporting of ADRs, effective implementation and collaborative efforts between government, regulatory officials, pharmaceutical companies, health care professionals and patient may lead to an effective pharmacovigilance system in India to insure the availability of safe medicines to public. The only way to guarantee that a medicine is safe over its entire life cycle is through pharmacovigilance. That is extremely important since clinical studies often struggle to find unusual and extremely rare ADRs. There is a wealth of the information and knowledge accessible regarding the safety of any medicine, Drug regulators must make the right decisions to protect the public's health. The treatment outcomes of patients with rare diseases, early diagnosis, and natural history of rare diseases are the future research trends in this field. The four most compelling research hotspots are clinical trials of orphan drugs, postmarketing ADR surveillance for orphan drugs, management of rare diseases and orphan drugs, diagnosis and treatment of rare diseases. Compelling utilization of pharmacists' workforce will enhance the result of the pharmacotherapy and in addition decline worldwide wellbeing costs. Every reporting by healthcare professionals is Date 2024-02-14 Words 360 Characters 2644 important; even though, focus on the serious unlabelled type of ADRs is more important. There are significant efforts on the pharmacovigilance to make it the more watching after the concept has emerged and day by day we are closer to the destiny.

## 7. REFERENCE

- [1] Basile, A. O., Yahi, A., and Tatonetti, N. P. (2019). Artificial Intelligence for Drug Toxicity and Safety. *Trends Pharmacol. Sci.* 40 (9), 624–635. doi:10.1016/j.tips.2019.07.005
- [2] Bate, A., and Hobbiger, S. F. (2021). Artificial Intelligence, Real-World Automation and the Safety of Medicines. *Drug Saf.* 44 (2), 125–132. doi:10.1007/s40264-020-01001-7
- [3] Crisafulli, S., Ientile, V., L'Abbate, L., Fontana, A., Linguiti, C., Manna, S., et al. (2021). COVID-19 Patient Management in Outpatient Setting: A Population-Based Study from Southern Italy. *Jcm* 11 (1), 51. doi:10.3390/jcm11010051