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Review on Pharmacovigilance Method, Recent Developments, Future Perspective and Software

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Abstract: ***Pharmacovigilance starts in the clinical stage and continues the entire drug's life cycle. Pharmacovigilance is the study, identification, and prevention of potential drug-related issues and side effects, with an emphasis on the acute and long-term impacts of pharmaceuticals, biological products, herbal remedies, and traditional treatments. Pharmacovigilance has changed recently, becoming more and more crucial to improved clinical practice and public health research. Pharmacovigilance employs a range of techniques, including focused clinical investigations, stimulated reporting, passive and active surveillance, comparative observational studies, and descriptive research. New advances in pharmacovigilance are crucial to meeting patient needs and maintaining their health. Three papers in pharmacovigilance are available for future guidance: Waller and Evans' Erice Manifesto for Global Reform of the Safety of Medicines in Patient Care; the Erice Declaration on Transparency; and the Erice Declaration on Transparency. Pharmacovigilance in the future must be able to identify safe problems quickly in order to persuade the patient about the drug's safe use. Additionally, pharmacovigilance techniques can be used to determine which patients are susceptible to adverse drug reactions (ADRs) and how those reactions might occur. The use of patients as information sources in the pharmacovigilance sector is crucial for this process. The majority of software uses are for ADR administration and reporting. The programmes that are most frequently used include repClinical, PvNET, Oracle Argus Safety, ArisG, and Oracle adverse event reporting.***

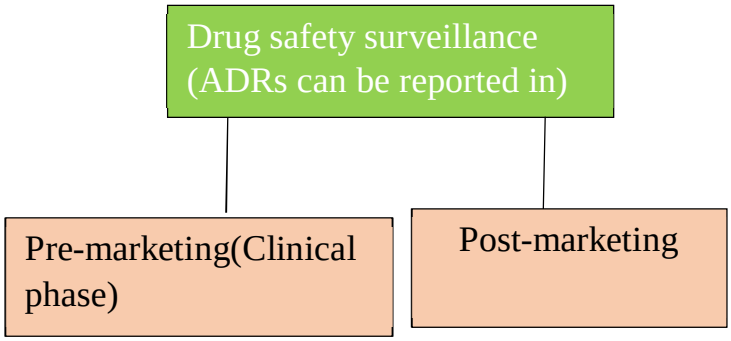
Keywords: Pharmacovigilance, Active surveillance, adverse effects, reporting.

I. INTRODUCTION

Pharmacovigilance is the study, identification, and prevention of potential drug-related issues and side effects, with an emphasis on the acute and long-term impacts of pharmaceuticals, biological products, herbal remedies, and traditional treatments. It is crucial to the decision-making process in pharmacotherapeutics. (3, 9)

It encourages sensible and safe drug usage by:

1) Improving the prompt identification of medication interactions and ADRs that were not previously known.
2) Identifying the risk factors for ADR development.
3) Evaluation of the benefit/risk analysis's quantitative components.
4) Sharing knowledge to enhance medication prescription and regulation. (4) Pharmacovigilance starts in the clinical stage and continues the entire drug's life cycle. (9)



Pharmacovigilance has changed recently, becoming more and more crucial to improved clinical practice and public health research. However, in order to create a better healthcare system globally, pharmacovigilance is facing several obstacles these days.

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The main obstacles encountered in pharmacovigilance are as follows:

a) Online-based sales and data
b) Globalisation
c) More general safety issues
d) Evaluation of well-known items
e) Public health economic growth compared to the pharmaceutical industry
f) Views of risk and benefit. (10)

II. METHODS OF PHARMACOVIGILANCE

1) Passive surveillance
2) Active surveillance
3) Stimulated reporting
4) Comparative observational studies
5) Targeted clinical investigations-
6) Descriptive studies

A. Passive Surveillance

This kind of spontaneous reporting system, known as pharmacovigilance, places the onus of detecting and reporting adverse drug reactions (ADRs) on healthcare personnel. (11) The most popular reporting technique is thought to have been established as:

1) Effortless
2) Least expensive of all the techniques.

However, in comparison to other approaches, this spontaneous method has an extremely low reporting rate. In districts where there is not enough funding or staff to conduct active surveillance, spontaneous reporting can be carried out using National ADR reporting forms. (12)

B. Active Surveillance

To find the unfavourable occurrences, proactive steps are implemented. (13) The patient's follow-up following medication is the foundation of this pharmacovigilance approach. One way to identify the negative medication effects is by:

1) Asking patients directly
2) Reviewing patient records for irregularities. (12)

A detailed analysis of each AE report may be possible. (13)

C. Stimulated Reporting

Health practitioners are encouraged to report new goods using this approach. The reporting method consists of:

1) Online adverse event reporting
2) Systematic incitement of unfavourable outcomes.

D. Comparative Observational Studies

The primary purpose of these research is validation of signals derived from case series or spontaneous reports. It is a conventional approach to assessing adverse medication occurrences. (15)

Comparative observational research projects:

1) Cross-sectional studies
2) Case-control studies
3) Cohort studies

E. Targeted Clinical Investigations

Studies on pharmacokinetics and pharmacodynamics are carried out. When risk factors are found in pre-approval clinical studies, additional trials are conducted to assess the mechanism of action of ADRs. (14)

F. Descriptive Studies

The background rate of outcome events is obtained by establishing the prevalence of drug use in a given community. (13)

III. RECENT DEVELOPMENTS IN THE FIELD OF PHARMACOVIGILANCE

New advances in pharmacovigilance are crucial to meeting patient needs and maintaining their health. Three pharmacovigilance publications are available for future guidance.

The three publications are made up of

A. Included in the Erice Declaration on Transparency are the Following Claims

1) Information on drug safety must be provided to the public in order to support their health.

2) Disseminating additional safety information or information about the proper and safe use of the drugs to the greatest number of members of the public and medical professionals.

3) Studies that compare observational data Studies that are cross-sectional Case-control research Studies using cohorts Introspective Potential Studies that are descriptive The natural progression of illness study on drug use

4) All available evidence needs to be adequately evaluated in order to comprehend the benefits and hazards.

5) In order to guarantee the accessibility of data on the safety of all medications, which is gathered and subsequently assessed, each nation needs to establish a framework with impartial knowledge. (4)

6) New advancements in medication safety monitoring are necessary to ensure accurate and timely problem identification as well as effective communication of treatment options.

B. The Erice Manifesto calls for a Worldwide Overhaul of Pharmaceutical safety in Patient care. Comprises the following Claims

1) Both the general public and patients should actively participate in the discussion of the advantages and disadvantages of the medications as well as in the decision-making process regarding their own care. (7)

2) New methods for gathering, analysing, and disseminating information regarding the efficacy and safety of medications must be devised. A candid debate must also be held before a decision is made.

3) Professional, official, and public collaboration should be learnt along with the ways that pharmacovigilance approaches need to be enhanced.

4) Due to the pharmacovigilance's observable benefits to the public, lawmakers, officials, scientists, physicians, patients, and the general public must all support it. (16)

C. Waller and Evans: Consists of

They discussed how they thought pharmacovigilance should be conducted going forward. The fundamental principles of pharmacovigilance are

1) Excellence, which is the highest achievable outcome

2) The scientific approach

3) Openness and honesty.

IV. FUTURE PERSPECTIVES

In order to establish pharmacovigilance as a science, it is imperative to create new techniques that may be applied to strengthen the existing system.

Pharmacovigilance, as we are all aware, is all about

1) Finding fresh ADRs
2) To implement the necessary regulatory measures to safeguard the public's health by
a) Modifications to the SPCs, or summary of product features or
b) Drug taken off the market (2)

The primary goal of pharmacovigilance is to communicate information that can assist healthcare professionals in making decisions regarding the use of drugs. An emphasis has been placed on this process of generating information. First of all Early in the drug development process, active surveillance is used to obtain information regarding the safety of the drug for use. However, when collecting information in the post-marketing phase of active surveillance, it is important to remember to collect the data on time. Although there aren't many publications that discuss spontaneous reporting, it was helpful in the creation of signals. As a result, it becomes harder to detect ADRs when risk factor identification is poor. (16). Individual risk variables are identified by pharmacogenetics for the incidence of specific ADRs. It has been noted that the patient's role is gradually changing these days. (17) Patients today are well informed about the disease and actively participate in treatment, but in the past, they were not very aware of it and their participation was also relatively low. Patients have the ability to report adverse drug reactions (ADRs) in several countries; this trend will continue in the future and serves as a valuable information source. Since its introduction in the 1960s, the field of pharmacovigilance has experienced remarkable growth. (15) Major changes have been made to pharmacovigilance systems to ensure they meet future standards. The discipline of intensive monitoring contributes to the innovation required in this industry. Pharmacovigilance in the future must be able to identify safe problems quickly in order to persuade the patient about the drug's safe use. Additionally, pharmacovigilance techniques can be used to determine which patients are susceptible to adverse drug reactions (ADRs) and how those reactions might occur. The most crucial element in this process is using patients as information sources for pharmacovigilance. First of all

V. SOFTWARE USED IN THE FIELD OF PHARMACOVIGILANCE

A. Software used in Pharmacovigilance

1) Oracle Argus Safety

It is an extensive platform mostly utilised to meet pharmacovigilance needs. Pharmacovigilance is currently dealing with issues such as a rise in case volume, complicated business, difficulty analysing safety data, and inconsistent data sources. It is therefore made to handle the needs.

The advantages of Argus safety are as follows:

a) Monitoring of regional data elements
b) Capabilities for risk management
c) Benefits of a product: risk profile
d) Multiple search functions
e) Enhanced medication safety
f) Examining traces

2) ArisG

The software that pharmaceutical companies use the most frequently has the capability needed to handle adverse event reporting. ArisG manages adverse medication reactions with sophisticated automated features and a flexible workflow. ArisG forms a fundamental part of the risk management system, which enables organisations to actively detect risk factors and monitor products with ease.

3) Oracle Adverse Event Reporting

Designed with ease of use by experts, Oracle AERS is accountable for the following:

a) ADR capture
b) ADR Management
c) ADR reporting
d) ADR analysis
e) Cases involving product compliance

4) PvNET

It is among the most crucial pieces of software for pharmacovigilance's adverse drug event reporting, ADR data management, and creation and examination of numerous regulatory reports. PvNET facilitates the incorporation of safety information, which in turn aids users of the software in making critically informed decisions. It can have more functionality added to it through addon modules. (18)

5) repClinical

This software, which is among the safest web-based services available, is primarily in charge of managing pharmacovigilance tasks in a timely and economical manner. It functions in a very straightforward and efficient way (18).

a) Gathering data about unfavourable events
b) Producing regulatory reports
c) Make changes to and add tracked cases to repClinical.

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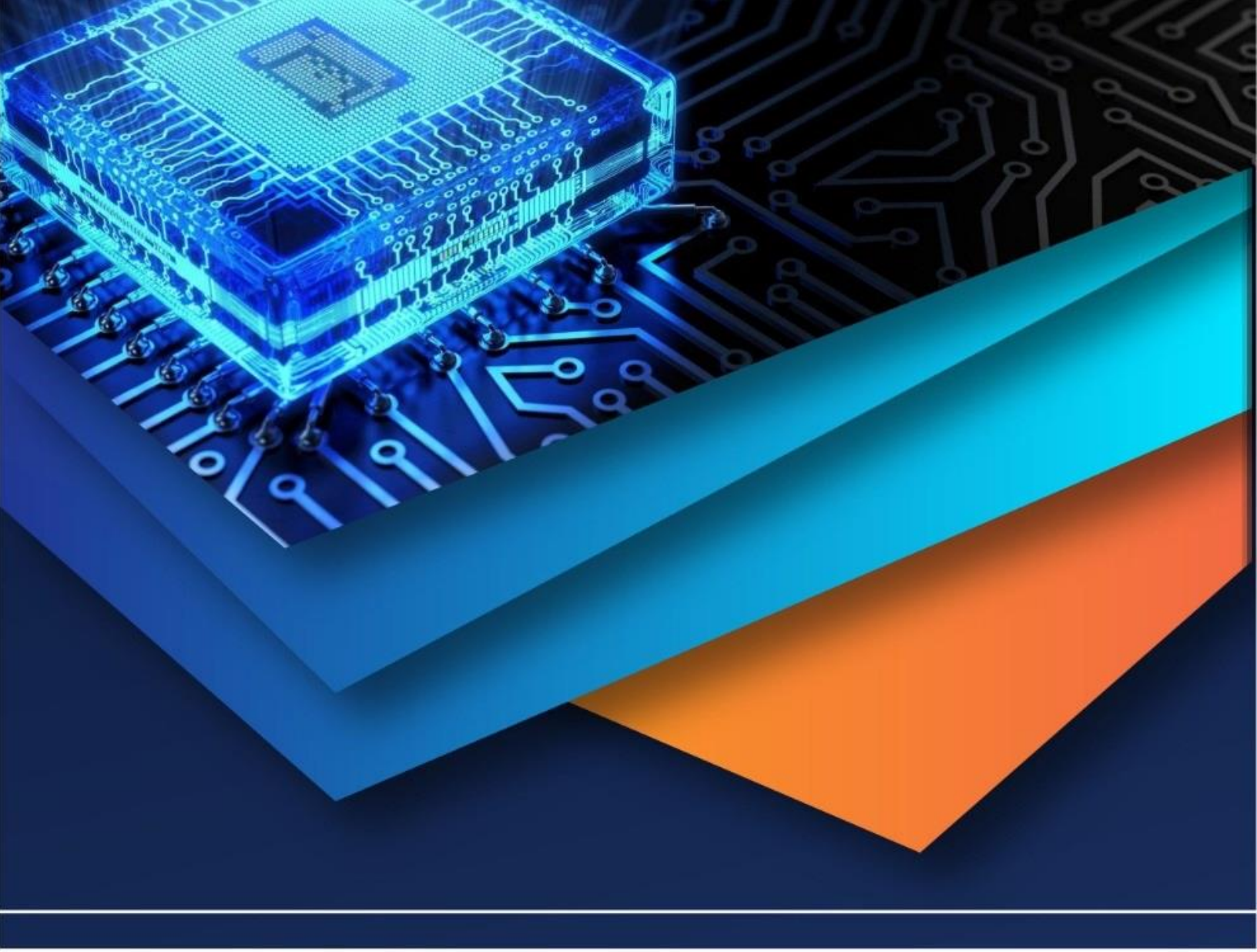

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