Review Article

Review About Pharmacovigilance of Vaccine

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ABSTRACT

The pharmacovigilance of vaccine is defined as the science and activities relating to detection, assessment, understanding, prevention and communication of adverse events of immunisation or any other vaccine or issues related with immunisation. The strengthening of pharmacovigilance is very importance in every country because it helps professional health care workers to avoid the problems with immunisation, protect the health of people from adverse event during immunisation. The success of the immunisation is reducing morbility and mortality related to the vaccine. The vaccine is biological product used to prevent infectious diseases but sometimes the vaccines can cause some AEFI. The detection of adverse events followings correct immunisation is one very importance step for prevention of problems immunisation system.

Keywords: Vaccine and types, vaccine safety surveillance, pharmacovigilance method, communication in pharmacovigilance.

INTRODUCTION

The term vaccine has been derived from the Latin word (**vac** which mean **cow**).

The medical definition vaccines are pharmaceutical suspension or solution of immunogenic substance intended to induce active immunity.

The vaccine is defined as any substance which is used to stimulate the production of antibodies in turn providing immunity against one or few disease.

TYPES OF VACCINE:

- ✓ Inactivated-killed vaccine,
- ✓ Live-attenuated vaccine.

1. In activated-killed vaccine:

The vaccine is prepared either by killed or inactivating the pathogen using heat or some chemical thus altering its antigenicity these vaccines are first administered as primary dose and then as booster dose(s)

Bacterial vaccine:

- ❖ Typhoid vaccine
- ❖ Cholera vaccine
- ❖ Plague vaccine
- ❖ Haemophilus influenza vaccine
- ❖ Whooping cough vaccine
- ❖ Meningococcal infection

Viral vaccine:

- ❖ Rabies vaccine
- ❖ Influenza vaccine
- ❖ Hepatitis vaccine
- ❖ Polio vaccine

2. Live attenuated vaccine

Bacterial vaccine:

- ❖ Bacillus calmette guernine vaccine (BCS)

Viral vaccine:

- ❖ MMR
- ❖ Polio sabin

GENERAL PREPARATION OF VACCINE

Bacterial vaccine preparation:

Bacterial vaccine is prepared using the selected starch of bacteria. Thus, the bacteria first tested for purity and identify.

Steps:

1. Selected strains of bacteria cultivated on solid medium.

2. For 1-2 days and then washed with sterile normal saline

3. Suspension obtained is shaken for uniform distribution

4. Fragment on the medium are removed by centrifugation or sedimentation

5. Then suspension is sterile by heat treatment or by using alcohol or other bactericides.

6. Vaccine prepared from culture of non-sporing bacteria are sterilized in vaccine bath for an hour at 56-60° temperature to kill the bacteria.

7. Heat applied should kill the microorganism but should also test in antigenic properties

8. After sterilization.

9. Product filled into previously sterilized by container and sealed under aseptic condition.

10. The container should present the label.

Examples: BCG vaccine, Typhoid vaccine, Cholera vaccine...

VACCINE SAFETY SURVILLANCE

IMPORTANCE OF VACCINE PHARMACOVIGILANCE

- It is necessary to train health care workers, physicians of hospitals and Healthcare Centers, pediatricians, epidemiologists, pharmacists etc., involved in adverse events.[1]
- Effective communication in pharmacovigilance requires not only the knowledge of drugs, their impacts and effects, but also an understanding of the roles and responsibilities of the different stakeholders.[2]
- Every drug or vaccine must be tested before using for safety and efficacy.

ROLE OF PHARMACOVIGILANCE ON VACCINE CONTROL

- ✓ Pk and Pd studies
- ✓ Drug-Food interactions
- ✓ Drug-Drug interactions
- ✓ ADR-Monitoring
- ✓ Genetic variations
- These all are to improve the safety and efficacy of the product.

RESPONSIBILITIES OF PHARMACOVIGILANCE

- The responsibilities of vaccine pharmacovigilance are,
  - ✓ Publication & reporting of adverse events
  - ✓ Gathering of information on and reporting of cases of adverse events
  - ✓ The recording of evaluations of clinical cases
  - ✓ Comparing, analyzing of adverse events and forming an evaluation
  - ✓ The identification of the "noise" from the signal.

SAFETY & EFFICACY RELATED TO PEDIATRICIAN USE

- During times when vaccines were in use, at least 4000 children divided in 3groups were monitored:

  - infants from 2 months old to 2 years old (500)
  - Children from 2 years old to 9 years old (500)
  - Children/Teens from 9 years old to 18 years old (3000)

- These children were included in a safety group and followed up at least for the next 6- months after their last dose.[3]

SAFETY OF VACCINE, SIGNAL

Detection of signal is the identification of unknown adverse events. The evaluation of data collected at this stage is very important.

- Signal would not elude.
- Signal would be detected early
- "False" signal would be kept to a minimum. Do not publish before explanation of the case.
- Recording the information related to possible causes between vaccines and adverse events.
- Previous unknown relationship or gaps in the documentary
- Serious adverse events or reactions that result in one's death or hospitalization, the inability to work or lawful inability (for example paralization).

STEPS OF VACCINE PHARMACOVIGILANCE

- Detect signal suggesting AEFI is related to vaccine.
- Develop hypothesis about casual association between an AEFI and vaccination.
- Test hypothesis through appropriate epidemiological methods.

HOW TO ENHACE VACCINE SAFETY

- ❖ Enhance timely detection and verification of vaccine safety signals.
- ❖ Improve causality assessments of vaccines and related AEFIs.
- ❖ Improve scientific knowledge about why and among whom vaccine adverse reactions occur.
- ❖ Improve clinical practice to prevent, identify and manage vaccine adverse reactions.
- ❖ Enhance collaboration of vaccine safety activities.

DOCUMENTING & REPORTING ADVERSE EVENTS DUE TO IMMUNIZATION

- Documenting and reporting AEFI is teamwork, and seamless flow of information involves the role of different stakeholders, as follows,
  - ✓ Peripheral health workers
  - ✓ Peripheral medical officers
  - ✓ Private practitioners
  - ✓ DIOs
  - ✓ State immunization officer
  - ✓ Role of AEFI secretariat
  - ✓ Role of national AEFI committee
  - ✓ Role of marketing authorization holder (MAH).

- Many countries carry out monitoring of AEFI by an effective national AEFI surveillance system.

GLOBAL SCENARIO

- ✓ The Vaccine Adverse Event Reporting System is a national program to monitor the safety of US-licensed vaccines. This program was commenced in 1990 and co-sponsored by the United States Food and Drug Agency and the Centers for Disease Control and Prevention.[4]
- ✓ The Canadian Adverse Events Following Immunization Surveillance System is the post marketing safety monitoring system of marketed vaccines in Canada.[5]
- ✓ In the United Kingdom, the Medicines and Healthcare products Regulatory Agency (MHRA) is at the helm of monitoring the safety of all marketed medicines including vaccines. The suspected AEs following the use of vaccines can be reported to the MHRA through the Yellow Card Scheme. [6]

COMMON REASON FOR VACCINATION FAILURE:

1. Lack of maintenance of cold chain from the time of manufacture till vaccination. Cold chain is the system of transporting and storing vaccines within the temperature range of 2 to 8 degree Celsius.
2. Poor quality of vaccine – Quality will deteriorate if repeatedly thawed and cooled.
3. Poor immune response in weak and improperly fed individual.
4. Lack of herd immunity due to only a few people being vaccinated.

VACCINE FAILURE CAN BE:

1. Host related

2. Vaccine related

3. Manufacturing problems

HOST RELATED REASONS:

Host related reasons may be defined as immunodeficiency or insufficient immune response like age related, maturation problem of immune responsiveness, waning immunity, suboptimal health status and immunological interference

VACCINE RELATED REASONS:

The main vaccine related reason is that vaccines are not 100% efficacious against all included antigen. Moreover, there may be incomplete coverage of strains, serotypes, genotypes, antigenic variants, or escape mutants which can cause a vaccine preventable disease.

MANUFACTURING PROBLEMS:

The problems about manufacturing may also lead to vaccine related vaccination failure. The definition of a confirmed clinical vaccine failure is the occurrence of the specific vaccine preventable disease in an appropriately and fully vaccinated person after sufficient time has elapsed for the antigens of vaccine to develop.

EXAMPLE:

Conversely, at the same season, iiv [inactivated influenza virus] showed an insignificant effect against influenza B or influenza A [H3N2] but a significant effect [100%] against influenza A [H1N1].

It showed that the,

- Shelf life of the vaccine influences its effectiveness and vaccine loss potency before expiry date. Ineffective when used after expiration.

- Vaccines are best when used before the expiry date provided by the manufacturer along with proper storage and transportation.

EFFICACY OF VACCINE INFLUENCED BY:

Influenced by their quality [ex; potency]

Vaccines normally function better in lab than in the field because the settings are cleaner and animal used in research are frequently devoid of specific pathogens and have not been exposed to other immunosuppressive agents.

One common argument frequently found in anti-vaccination literature is that people still get the disease after vaccination.

- That means the lack of vaccine efficacy

- Lack of adequate protection are the reasons for the vaccine failure.

Also, failure indicates that, vaccine has not administered appropriately.

VACCINATION EFFICACY IS DETERMINED BY:

Vaccination efficacy can be determined based on obtained results, such as disease prevention, reduction in the clinical course of the disease or immune response.

TWO SUBGROUPS:

Within the failure of the vaccine, two subgroups were distinguished.

1. The first one was related to incorrect usages, such as the wrong vaccine dose or administration route, lack of booster, inappropriate storage conditions or vaccine use beyond the expiry date.
2. The second mentioned group includes such issues as low vaccine potency, the imperfect antigenic match between field and vaccine [strain, serotypes, genotypes, or antigenic variants], interfere with co administered vaccines or some manufacturing problems.
3. Apparently, failure to vaccinate is greater than a problem than vaccine failure.

TYPES OF VACCINATION FAILURE:

1. Primary failure
2. Secondary failure

Theoretically, 2 types of vaccination failures can be distinguished:

Primary failures, due to complete non responsiveness to the vaccine. Secondary failures, in which adequate immunity is not maintained despite initial response to vaccination. [7]

ADVERSE EVENTS FOLLOWING IMMUNISATION

Adverse Events Following Immunization (AEFI) Vaccines, being biological products, are expected to result in some adverse events. Vaccine safety concerns are not new. With rising number of vaccines for human use, these concerns are also on rise globally. Adverse event following immunization (AEFI) is 'any untoward medical occurrence which follows immunization and which does not necessarily have a causal relationship with the use of the vaccine'. The adverse event may be 'any unfavourable or unintended sign, an abnormal laboratory finding, a symptom or a disease'. The characteristics of AEFIs include: temporality, strength of association (epidemiological, statistical significance, not by chance), biologic plausibility, consistency of evidence, specificity, and possible dose response with the vaccine/vaccination.[8]

Immune Mediated Reactions

These reactions are induced by the antigen and/or any vaccine constituent through the innate and/or adaptive immunity pathway. Anaphylaxis is an example of type-I (immediate) hypersensitivity reaction, mast cells and basophiles activation through the IgE, its high-affinity receptors which release histamine, tryptase, carboxypeptidase, proteoglycans and other inflammatory markers [9]

Viral/Bacterial Activity

The inherent property of the live attenuated bacterial and viral vaccines may cause conditions like Bacillus Calmette Guraine (BCG) disease or osteitis and vaccine-derived poliomyelitis. The vaccine manufacturing defects involving incomplete inactivation of the bacteria or virus may lead to the disease or altered manifestation, like the Cutter incident[10]

Injection Related Reactions

Errors in vaccine storage, handling, preparation/ reconstitution, administration and ignoring the contraindications, may cause exaggerated local reaction, cellulitis, abscess, toxic shock syndrome, sepsis, nerve injury, blood-borne infections and even death. These errors are preventable and all efforts must be made to reduce/avoid these

Psychological Reactions

A range of symptoms related to anxiety may arise around immunization, known as 'immunization anxiety-related reaction' including dizziness, vasovagal syncope, heart racing, nausea, blurred vision, sweating, hyperventilation, pseudo seizure, and conversion reaction. The manifestations are usually seen in adolescents and adults and its severity depends on the recipient's biological, psychological and social factors and the vaccination site environment

The study participants were observed for 30 min post vaccination to look for any immediate adverse events. A trained interviewer conducted a telephonic interview to assess the adverse events following the Covaxin vaccination. The telephonic follow up was conducted once between the 7th and 10th day of vaccination. Solicited local adverse events like pain at the injection site, tenderness/soreness, erythema, swelling/induration, pruritus associated with injection, and solicited systemic adverse events like pain, fever, nausea/vomiting; headache, fatigue, myalgia, acute allergic reaction, rash, and joint pain were assessed. All the unsolicited adverse events reported by the study participants were also reported. The adverse events were graded based on the US Food and Drug Administration (FDA) document for the toxicity grading scale for healthy volunteers in preventive vaccine trials. The adverse events were graded as mild, moderate, severe, and potentially life threatening based on the severity [11]

PHARMACOVIGILANCE METHODS:

Passive Surveillance

Passive surveillance means that no active measures are taken to manage the adverse effects other than the encouragement of health professionals and others to report safety concerns. In this the reporting is completely dependent on the initiative and motivation of the potential reporters.

It is also called spontaneous or voluntary reporting and the most common form of pharmacovigilance. Clinicians, pharmacists and community members should be trained on how, when and what to report.

SPONTANEOUS REPORTS AND CASE SERIES:

An unsolicited communication by the health care expert or consumers that describes one or more ADR in a patient who was administered one or more medical products that is not derived form a study or any organisation data collected scheme is called a spontaneous report.

Reporting Requirements:

According to WHO criteria, the following basic information is required before a report is acceptable:

1) A source of information that can be identified.

2) A patient that can be identified.

3) Name(s) of the suspected product(s) and

4) The suspended reaction description

STIMULATING REPORT:

Stimulated reporting is a method used to encourage and facilitate reporting by health professionals for new products, or for limited period. Types of methods have been used to confirm and simplify reporting by health experts in specific situation for new product or for partial time duration. Such systems comprise online reporting and methodical motivation of reporting of adverse event based on a per designed method.

Importance of Reporting

Clinical trials are not able to explain all adverse reactions associated with medication due to limited sample size, controlled environment, and limited time of drug exposure. Additionally, special types of the population are not exposed to the drug in clinical trials. Therefore, post marketing safety surveillance systems are needed to find out unreported safety concerns during the pre-marketing phase5. Prompt reporting is important for drug safety monitoring. Under-reporting delays early detection of drug safety issues. For instance, about seven million patients were exposed to fenfluramine before identification of valvular heart disease (VHD) associated with this medication, which subsequently led to the withdrawal of

The drug from the market. From the Indian database of ADRs from January to December 2018, only 0.01% were new safety alerts.[12]

Few new drug safety alerts namely artemether +lumifantrine induced Steven Johnson Syndrome (SJS), and lamivudine induced hearing loss were identified as global drug safety signals by World Health Organization. However, these alerts are still not accepted as safety signals in the Indian context due to underreporting[13]

Furthermore, reporting helps to detect or hypothesize rare and delayed potential hazards with medications. Contributing large database will in turn help to enhance patient care and also help healthcare professionals better understanding the rational use of medications. In light of the under-reporting of ADRs being an important concern, we aim to discuss strategies that can improve reporting by stimulating healthcare professionals and substantiate [14]

ACTIVE SURVEILLANCE DEFINITION:

The WHO defined active surveillance as the collection of case study information as a continuous pre-organized process. It involves identifying adverse events that are likely to be associated with medical products. Active surveillance identifies cases screening through hospital admission records, emergency department logs, medical wards, and intensive care units and out-of-hospital facilities, including nursing homes, radiology centers, and physicians' offices. Screening is the essential step in active surveillance. Active surveillance involves visiting health facilities, talking to healthcare providers and reviewing medical records, to identify suspected cases of disease. It involves physical review of medical records and registers, interviews with health workers and visit to relevant outpatient clinics and hospital wards under surveillance. When a case is found, the active surveillance staff investigate it, document clinical and epidemiological data, arrange to send appropriate laboratory specimens and report the information rapidly.

CIOMS DISTINGUISHED THREE TYPES OF ACTIVE SURVEILLANCE:

- (The Council for International Organizations and Medical Sciences)

  1) Drug based : Identifying adverse events in patients taking pharmaceutical products.

- 2) Setting based: Identifying adverse events in certain health care settings where patients are likely to present for treatment (emergency departments, etc).

- 3) Event based: Identifying adverse events that are likely to be associated with medical products (e.g., acute liver failure).

ADVANTAGE:

- More targeted/ detailed/ specific data.
- May facilitate timely collection of data.

DISADVANTAGE:

- More expensive than passive surveillance

METHODS:

Some of the methods to yield comprehensive data through active surveillance are;

- Sentinel sites
- Drug event
- Registries

SENTINELSITES:

Active surveillance can be attained by revising medical records or questioning patients and/or physicians in a section of sentinel sites to guarantee that comprehensive and precise data on reported adverse events are collected from the sites. The selected sites can deliver information, such as data from specific patient subgroups, which would not be accessible in passive spontaneous reporting system.

Active surveillance with sentinel sites is most effective for those medicines used primarily in institutional settings such as hospitals, nursing homes and hemodialysis centers. Sentinel surveillance is the monitoring of rate of occurrence of specific diseases/ conditions through a voluntary network of doctors, laboratories and public health departments with a view to assess the stability population. It also describes the study of disease rates in a specific cohort such as geographic area or subgroup to estimate trends in larger population.

LIMITATIONS:

- Selection bias
- Small number of patients
- Augmented cost

DRUG EVENT MONITORING:

In this system, patients are first identified from electronic prescription data or automated health insurance claim. A follow up questionnaire can then be sent to each prescribing physician or patient at a pre-specified intervals to obtain outcome information.

Drug event monitoring can be divided into:

A. Medicine event monitoring

B. Cohort event monitoring

A) MEDICINE EVENT MONITORING:

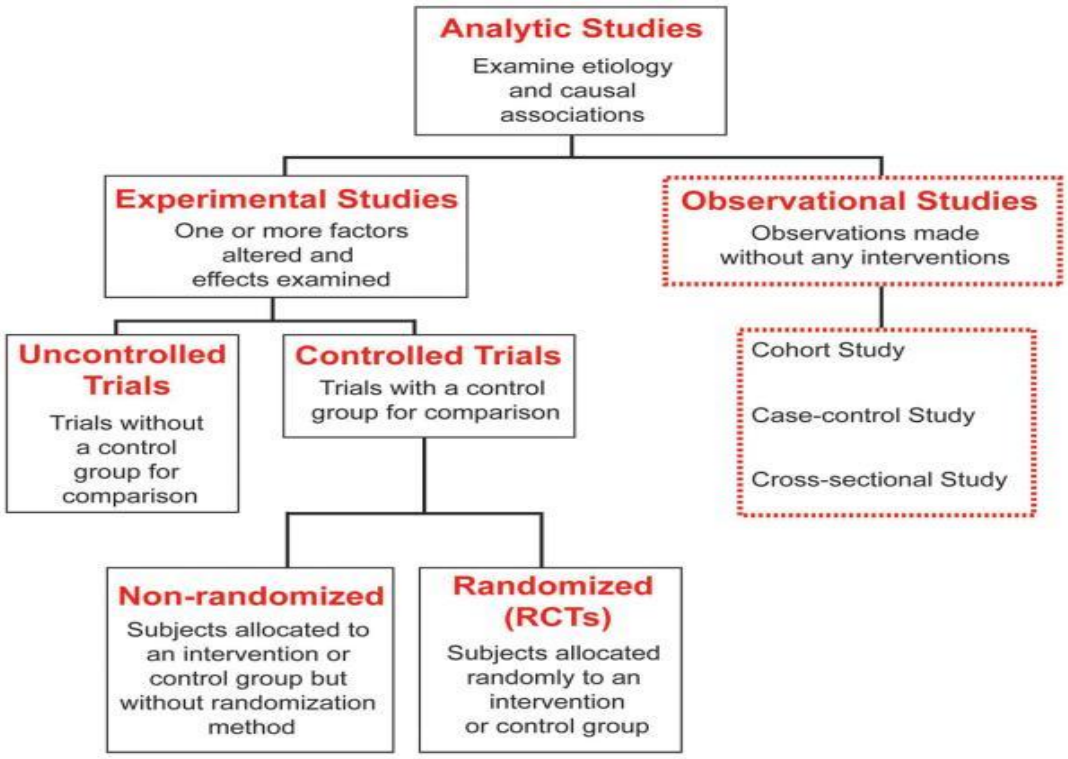
This a process of active pharmacovigilance surveillance. Studies using this process are cohort-based and prospective and observational. For medication event monitoring, patients can be acknowledged from electronic or automated health insurance claims. A single prescription or a series might be composed over the period of monitoring. A follow up questionnaire sent to each prescribing physician or patient. Requests for data on patient demographics, indication for treatment, duration of therapy, dosage, clinical events, reasons for termination and applicable past history can be involved in the questionnaires.

B) COHORT EVENT MONITORING:

In a cohort study, a population at risk for the disease or event is monitored over time to record the occurrence of the disease or event. A prospective, longitudinal, observational study for defined group of patients to identify ADR associated with one or more monitored medicine. Patient on a specific drug initially recruited follow up by clinic, home visit, phone calls, questionnaire fill at initial a post treatment, complete follow up is taken by sop of cohort.

REGISTRIES:

A registry is a list of patients prescribing with the identical representatives. This representative can be a disease (disease registries) or a specific exposure (medicine registries) Patient registries are organized systems that use observational methods to collect uniform data on a population defined by a particular disease, condition or exposure, and that is followed over time. A registry is a collection of information about individuals, usually focused around specific diagnosis or a condition.[15]



COHORT STUDY

The term "cohort" is derived from the Latin word *cohors*. Roman legions were composed of ten cohorts. During battle each cohort, or military unit, consisting of a specific number of warriors and commanding centurions, were traceable. The word "cohort" has been adopted into epidemiology to define a set of people followed over a period of time. W.H. Frost, an epidemiologist from the early 1900s, was the first to use the word "cohort" in his 1935 publication assessing age-specific mortality rates and tuberculosis. The modern epidemiological definition of the word now means a "group of people with defined

characteristics who are followed up to determine incidence of, or mortality from, some specific disease, all causes of death, or some other outcome."

Cohort studies can be prospective or retrospective. Prospective studies are carried out from the present time into the future. Because prospective studies are designed with specific data collection methods, it has the advantage of being tailored to collect specific exposure data and may be more complete. The disadvantage of a prospective cohort study may be the long follow-up period while waiting for events or diseases to occur. Thus, this study design is inefficient for investigating diseases with long latency periods and is vulnerable to a high loss to follow-up rate. Although prospective cohort studies are invaluable as exemplified by the landmark Framingham Heart Study, started in 1948 and still ongoing, in the plastic surgery literature this study design is generally seen to be inefficient and impractical. Instead, retrospective cohort studies are better indicated given the timeliness and inexpensive nature of the study design.

CASE-CONTROL STUDIES

Case-control studies were historically borne out of interest in disease etiology. The conceptual basis of the case-control study is similar to taking a history and physical; the diseased patient is questioned and examined, and elements from this history taking are knitted together to reveal characteristics or factors that predisposed the patient to the disease. In fact, the practice of interviewing patients about behaviors and conditions preceding illness dates back to the Hippocratic writings of the 4th century B.C.

Reasons of practicality and feasibility inherent in the study design typically dictate whether a cohort study or case-control study is appropriate. This study design was first recognized in Janet Lane-Claypon's study of breast cancer in 1926, revealing the finding that low fertility rate raises the risk of breast cancer [16]

In the ensuing decades, case-control study methodology crystallized with the landmark publication linking smoking and lung cancer in the 1950s[17]

Since that time, retrospective case-control studies have become more prominent in the biomedical literature with more rigorous methodological advances in design, execution, and analysis.

TARGETED CLINICAL INVESTIGATION

Phase I Studies

Phase I, first-in-man studies refer to the first administration of a vaccine candidate to humans. The primary objective is to evaluate the safety and reactogenicity, while the secondary objective is collection of immune response. Often times, the dose, immunization schedule and mode of vaccine administration are also assessed.[18]

Phase II Studies

A candidate vaccine should proceed to Phase II clinical evaluation after achieving a satisfactory outcome in Phase I studies in terms of both safety and immunogenicity. The transition from a controlled clinical setting to field evaluation incurs much greater monetary investment, hence stringent go/no-go criteria are observed by the developers.[18]

Phase III Studies

Pivotal Phase III trials, essential for registration and approval to market of a vaccine, assess the effect of the final formulation. These trials are typically designed to evaluate efficacy and safety. Vaccine Efficacy (VE) is defined as the percent reduction in incidence (of disease or infection) among the vaccinated. If incidence of disease in unvaccinated subjects is Iu and in vaccinated subjects is Iv, then the VE is calculated [18]

COMMUNICATION IN PHAMACOVIGILANCE:

Pharmacovigilance communication is an interactive process in which information is exchange which can be beneficial for veterinarians and other health-care professionals for preventing and responding to any concerns that arises from pharmacovigilance. Communication to veterinarians and other health-care professionals, animal owners or veterinary medicinal products users can be defined as the transmission of information aiming to ensure safe and effective use of veterinary medicinal products.

Need to improve the communication

1) To improve patient care and understanding

2) To uphold transparency and liability.

Need of Communications in Drug Safety

1) For the welfare of millions of people worldwide.

2) To overcome severe risks of failure.

3) For improving the health care quality, communications are modified that are commonly poorly executed, second-rate and ineffective.

Effective Communication:

Effective communication in Pharmacovigilance Transferring information along with the evidence including that it has been received and understood, gave rise to some change and action. It has also produced feedback about the process. Principles of Effective Communications

1) To make an individual clear about the message and purpose.

2) To recognise the audience(s) empathy.

3) To choose appropriate methods/media

4) To provide the message with an impact.

The active, timely and effective communication plays a major role in issuance of updates on guidelines on drug

safety as per pharmacovigilance experts present in all around the world. Effective communication helps in creation of safety guidelines with the following statements:

The safety information on all the drug molecules must be sufficiently collected, assessed and made easily accessible to all by each country. Drug safety information must be able to improve health of the community. Health care providers and public must be educated regarding appropriate use of drug molecules along with safety information. Free access to all the evidences required to assess and understand risks and benefits of drug Information and remedies are efficiently communicated

These factors will definitely help in generation of drug safety guidelines and evaluation of risk vs. benefits ratio of drug molecules.

CRISIS MANAGEMENT:

World Health Organisation (WHO) defines a crisis as any unplanned event or succession of events which lead to interruption or destabilisation of the normal operations or activities of an organisation.[19]

Common Features of a Crisis :

1) Materialised condition.
2) Immediate decision required
3) Lesser time
4) Identification of definite threats
5) Receiving urgent demands for information
6) Sense of losing control is present
7) Pressure increase overtime
8) Increasingly difficult in routine business
9) To identify someone to blame certain demands are made
10) Unaccustomed interest is taken by outsiders
11) Suffering of reputation
12) Managing communications becomes increasingly difficult
13) An urge to defend and excuse is present. Prevention of problems affecting drug safety is an important part of drug safety crises management. Drug related morbidity and mortality can be reduced by carrying out the preventions

Crisis management is the process in which an organisation deals with a major unpredictable event that may affect the organisation, its stakeholders, or the general public.

Communication in Pharmacovigilance :(crisis management team) The role of the Crisis Management Team (CMT) within a business is a direct management process which should include the following points:

1) Establish what has happened.

2) Evaluate the impact.

3) Resolve any conflicts of interest.

4) Identify and prioritise action required.

COMMUNICATING WITH REGULATORY AGENCIES, BUSINESS PARTNERS HEALTHCARE FECILITIES AND MEDIA

Pharmacovigilance in the Regulation of Medicines:

The foundation for a national ethos of medicine safety as well as public confidence in medicines are given by robust regulatory arrangements. For being effective, the drug regulatory authorities should go further than the approval of new medicines, to include a wider range of issues related to the safety of medicines, that are namely:

1) Clinical trials

2) The safety of complementary and traditional medicines, vaccines and biological medicines.

3) The advancement of lines of communication between all parties which contribute in medicine safety, ensuring the efficient and ethical functioning of the drugs, mainly at the time of crisis.

Pharmacovigilance programmes and drug regulatory authorities should be supporting each other mutually in order to achieve their respective objectives. On one side, pharmacovigilance programmes require to maintain strong links with the drug regulatory authorities for ensuring that the latter are well described on safety issues in everyday clinical practice.

To conclude that whether these issues are relevant to future regulatory action or to concerns that arise in the public domain. On the other side, regulators require to understand about the specialized and pivotal role played by pharmacovigilance to ensure the ongoing safety of medicinal products.

Pharmacovigilance in Clinical Practice

Observation of the medicines in common use should be the fundamental part of clinical practice. The degree to which clinicians are informed about the principles of pharmacovigilance, and practice according to them, has a great effect on the quality of health care. To enhance effective patient care, the education and training of health professionals in medicine safety, exchange of information between national pharmacovigilance centres, the coordination of such exchange, and associating clinical experience of medicine safety with research and health policy are required. Therefore, a continuous flow and exchange of information means that the national pharmacovigilance programmes are ideally placed to identify gaps for understanding medicine-induced diseases.

Pharmacovigilance in Disease Control Public Health Programmes

In countries having no regulatory or safety monitoring system, and in rural areas having little or no health care surveillance and infrastructure; evaluation of medicine

safety is recognised as a matter for concern. Therefore, the problems are influenced in these situations which involve the use of medicines in treatment of specific communities, e.g., in the treatment of tropical diseases like malaria, Leishmanio sisans schistosomiasis, HIV/AIDS and tuberculosis.

The administration of medicines to large communities in settings several of disease control initiatives are being implemented within the same population along with little knowledge and concern regarding the interaction of the medicines with each other. Along with the public health disease control programme, pharmacovigilance should be a priority for every country.

Communication with Media

Who are the Media

1) Print: magazines, newspapers, community newspapers.

2) Electronic:radio, TV, internet.

3) Local and national levels.

Some Basic Questions a Reporter will Ask You

1) Who is affected, responsible? 2) What has happened and what is being done about it? 3) Where has it happened? 4) When did it happen? 5) Why did it happen? 6) Will it happen again?

CONCLUSION

The pharmacovigilance play a crucial role in monitoring the safety and effectiveness of vaccines. Througth robust surveillance systems and reporting mechanisms, adverse events associate with vaccines can be identified, investigated, and managed effectively. This continuous monitoring ensures that vaccines are safe for use and helps build public trust n immunization programs.

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