Importance of Adverse drug reactions (ADR) / Adverse drug event (ADE) reporting

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Abstract: -

Adverse Drug Reaction (ADR) is a deleterious response to a drug which is unexpected. This occurs at doses normally used in human for diagnosis, prophylaxis, or therapy of a disease or for modulation of physiological function of the body. An adverse drug event (ADE) is any indecent medical occurrence in a patient or patient or healthy person administered a pharmaceutical product and which does necessarily have to have a causal relationship with treatment.

ADRs and ADEs can lead to significant mortality and morbidity. Timely and Proper reporting of Adverse Drug Reactions (ADRs) and Adverse Drug Events (ADEs) is important for ensuring safety of patient, improving pharmacovigilance, and enhancing the quality of healthcare.

By systematically collecting and analysing ADR / ADE data, healthcare professionals can find new or unknown side effects, decide the risk to benefit ratio of medications, and take appropriate measures to alleviate risks. In this article authors have tried to highlight the importance of ADR/ADE reporting. We focus on its role in identifying drug-associated risks, averting harm, and notifying clinical decision-making.

Despite its importance, underreporting is still a problem, particularly in the Ayurvedic profession. To promote more thorough recording of ADR and ADE, it is crucial to raise awareness, educate people, and streamline reporting procedures. At the end, better ADR/ADE reporting can improve patient outcomes and confidence in our healthcare system by encouraging a culture of alertness and accountability.

Keywords: - Adverse Drug Reaction (ADR), Adverse drug event (ADE), Ayurveda pharmacovigilance

Introduction: -

According to WHO definition of ADRs, which has been in use for about 30 years, is "a response to a drug that is noxious and unintended and occurs at doses normally used in man for the prophylaxis, diagnosis or therapy of disease, or for modification of physiological function".

An adverse drug event (ADE) is when a medication causes harm to someone. ADEs include allergic reactions, side effects, over medication and medication errors. **(1)**

Adverse drug reactions (ADRs) significantly impact health globally, causing significant morbidity and mortality. Hospitalizations resulting from ADRs place a considerable economic strain on both developing and developed nations, with significant costs associated with treatment and care. **(2)**

In India, as per the annual report released in pharmacovigilance program of India (PvPI) for period between April 2020 to March 2021, 52810 ADRs were reported of which 28.10% were serious events. **(3)**

As ADRs are an inevitable part of treatment, healthcare professionals (HCPs) are encouraged to identify and spontaneously report individual case safety reports (ISCRs) using a predesigned suspected ADR reporting form.**(4)**

Studies have shown that under-reporting of ADR is widespread. **(5,6)**

A recent systematic review estimated the median incidence of ADRs that led to hospitalization and those that developed during hospitalization as 2.85% and 6.34% respectively **(7)**.

A study conducted by Rajakannan et al. valued the total cost of ADRs to the hospital as INR 1567397. The average cost of management of a patient hospitalized with an ADR was around INR 5000 (USD 115). The costs were found to be significantly burdensome for a country where the per capita annual expenditure on health is nearly USD 109 **(8)**. ADRs increase the length of hospital stay, add to treatment costs and are a burden on the healthcare system of a country.

Pharmacovigilance (PV) is the process to monitor patient safety in practical condition and analyse adverse events during the entire life cycle of a drug beginning from its trial phase to post-marketing of the drug.

PV is a specific domain of pharmacological sciences that deals with the drug safety information (DSI) of medicinal products. It is defined as the science and activities relating to

the detection, assessment, understanding, and prevention of adverse effects or any other possible drug-related problem.**(9,10)**

2. Methodology

Reviewing research publications, review articles, and other resources from online sources was part of the methodology. ADR/ADE reporting analysis and significance were found by carefully searching a number of papers, articles, and reports. The information gathered made it easier to comprehend the state of pharmacovigilance in India and other nations, as well as its history. The process also found a number of variables contributing to the underreporting of ADR and its importance.

A) The Purpose of Reporting in Pharmacovigilance: -

1) Discovering New Hazards

Continued monitoring can reveal previously undetected adverse effects or interactions. Continuous monitoring is indeed a critical process in identifying adverse effects or interactions that may not be immediately apparent during controlled clinical trials or initial phases of drug administration. The prospective supervision and observation inherent in monitoring can provide valuable insights into the efficacy of a drug and its potential to cause harm, allowing for timely adjustments in treatment. **(11)**

Continuous monitoring is crucial in identifying adverse drug effects and interactions that may not be fully identified during preliminary clinical trials. Effective monitoring schemes are necessary to ensure drug safety and efficacy while minimizing the risk of harm to patients. This particularly consider the prevalence of drug-drug interactions and the influence of genetic factors on drug responses.

2) Assessment of Risk-Benefit Profile: -

Data from reported cases help in evaluating the overall safety and efficacy of medications. The importance of PV has been underlined by the rapid development and approval of drugs, precisely through the COVID-19 pandemic, where hastened pathways have brought drugs to market with limited clinical data, thus increasing the reliance on post marketing surveillance.

Data from reported cases are indeed instrumental in evaluating the safety and efficacy of medications. Pharmacovigilance (PV) systems, which include the collection and analysis of

adverse event reports, play a critical role in this process. These systems are designed to detect, assess, and prevent adverse effects or any other drug-related problems. **(12)**

3) Disciplinary Actions by Regulators: -

Information from ADR/ADE reports can trigger regulatory bodies to take actions such as changing labelling information, restricting drug use, or withdrawing drugs from the market.

Reports on adverse drug reactions (ADRs) and adverse drug events (ADEs) are crucial instruments used by regulatory bodies to keep an eye on the safety of drugs after they are sold. These findings may result in changes to drug labels, limitations on drug usage, or, in extreme cases, the calling back drug from market if needed. **(13,14)**

The pharmacovigilance systems, which include the collection and analysis of ADR/ADE reports, play a major role in identifying and preventing risks associated with drug use.

ADR/ADE reports are critical for identifying dangers associated with drugs and have the potential to trigger important regulatory actions that protect patient safety. So, continuous efforts to improve the pharmacovigilance system and the quality of ADR/ADE reporting are necessary to increase drug safety.

4) Patient Safety Enhancement: -

Prompt identification and communication of drug-related risks can avoid damage and enhance patient outcome.

The information and communication technologies (ICTs) are now identified as an important tool to improve the sharing of information about ADEs. Patients and Health Professionals believe that the benefits of information sharing exceed the risks of privacy breaches, especially when it comes to improve patient safety. Additionally, the proactive management of patient safety has advanced significantly with the use of real-time risk identification tools.

B) ADR/ADE Reporting Difficulties: -

Despite the acknowledged importance of reporting, several challenges hinder effective ADR/ADE reporting:

1. Underreporting: -

The literature supports the claim that a significant number of Adverse Drug Reactions (ADRs) and Adverse Drug Events (ADEs) go unreported, citing time limitations, lack of awareness, and concern over potential legal repercussions as major factors. Research shows

that underreporting behaviours are associated with healthcare professionals' (HCPs) lack of knowledge regarding pharmacovigilance systems and ADR reporting. **(15,16,17,18)**

Another study conducted in Madhya Pradesh demonstrated that the gap between the number of ADRs experienced and the frequency of reporting them, was huge, especially among dentists and nursing professionals who had hardly reported an ADR in their career. **(19)**

It may be possible to increase reporting rates and improve patient safety by addressing the cited barriers such as raising awareness through education, simplifying reporting procedures, and mitigating fear of legal repercussions.

2. Reporting System Variability: -

Different countries and institutions have varying systems and standards for reporting, leading to inconsistencies in data collection and analysis.

Judson et al. (2022) highlights the varied COVID-19 reporting practices in African countries, with differences in the extent of data provided, such as risk assessment and response data, which were less commonly reported. **(20)**

To address these challenges, there is a need for enhanced international collaboration and the adoption of standardized reporting guidelines.

3. Training deficiency: -

Insufficient training and education on adverse drug reactions (ADRs) and adverse drug events (ADEs) are indeed significant factors contributing to poor reporting. Healthcare providers (HCPs) often lack clarity on what constitutes an ADR/ADE, the process for reporting, and the importance of such reporting for patient safety and pharmacovigilance.

Additionally, some HCPs may not receive regular updates or refresher training, which can lead to outdated knowledge and practices. **(21,22,23)** It has been reported that about 50% of the clinicians had never received any training on ADR surveillance methods. **(24, 25)**

4. Health care professional's Attitude towards ADR reporting: -

Healthcare professionals often complain of lack of time and in addition, there is also a lack of interest and/or time to get the appropriate reporting form. (**26**,**27**)

Some studies have also highlighted the perception that managing individual ADRs is more important than reporting them. **(26, 28)** This is compounded by the fact that they are

expected to fill additional forms for reporting ADRs. This results in lethargy and procrastination in reporting (**26**,**27**,**29**)

Some studies have also highlighted the perception that managing individual ADRs is more important than reporting them. **(26, 28, 30).**

5. Involvement of Patients: -

Patients may not always recognize or report adverse effects, leading to gaps in data collection. Patients' recognition and reporting of adverse effects are crucial for effective pharmacovigilance and healthcare delivery.

For instance, an observational study found that older patients admitted to a hospital could often correctly identify when they were experiencing side effects from drugs, but severe adverse drug reactions were not easily recognized by many them.

On the other hand, while some patients struggle to recognize or report adverse effects, others may be aware of them but lack the proper channels or knowledge to report. **(31)**

The doctors, nurses, and pharmacists who directly deal with patients are liable for reporting ADRs and ADEs. Patients should be advised to report any adverse effects that they may be experiencing from taking a medication, and they should be send to appropriate department or facility where they can do so.

Nonetheless, the information gathered from the questionnaire-based research involving pharmacists showed that there was, in fact, very little connection between them and their patients.

While the remaining pharmacists did not educate their patients about the anticipated therapeutic effects of the medications they would be taking, 58% of them did. According to 48% of pharmacists, they advise patients on the possible adverse effects of the medications they are taking. 37% of pharmacists reported that patients do not communicate with them on side effects, whereas 45% of pharmacists stated that patients tell them about any discomfort and adverse effects they experience during or after a medication. **(32)**

6. Other Factors

ADR reporting is voluntary in most countries. It was observed that some physicians do not report ADRs because of the lack of incentives or because they feel they should rather collect

the data and publish themselves. They also have an opinion that only safe drugs are available in the market and one report of adverse effect would not make any difference. **(33)**

C) Ways to Improve ADR/ADE Reporting

ADR/ADE reporting can be made more effective by implementing a few tactics in order to overcome its limitations.

1. Education and Training:

Awareness about ADR/ADE and reporting rates can be improved by Frequent training programs for healthcare professionals.

Regular training programs are indeed recognized as a crucial factor in enhancing the awareness and reporting rates of adverse drug reactions (ADR) and adverse drug events (ADE) among healthcare professionals. Studies have shown that educational interventions can significantly improve knowledge, attitudes, and practices regarding ADR/ADE reporting. **(34)**

Similarly, systematic reviews have identified educational intervention as one of the key motivators for healthcare professionals to report ADEs. **(35)** By focusing on educational interventions and continuous professional development, healthcare systems can foster a culture of safety and vigilance that is conducive to the timely and accurate reporting of ADRs/ADEs. **(35,36)**

Educational interventions can be targeted at multiple points in the profession like curriculum, internship training, seminars and Continuing Medical Education programmes. **(35,36)** Students should be taught principles of drug safety and rational drug use in their undergraduate and postgraduate curriculum. **(37)**

2. Streamline Reporting Systems : -

Easier-to-use, more efficient reporting systems may reduce the workload for medical professionals and foster more regular reporting.

The findings suggest that user-friendly, streamlined reporting systems could indeed alleviate some of the burdens faced by healthcare providers. Interestingly, while checklists and

error reporting systems have been shown to improve hospital patient safety, their effectiveness is contingent upon factors like organizational culture and resources. **(38)**

Additionally, the use of technology in healthcare such as cashless hospital services and e-hospitals has been linked to increased satisfaction and efficiency, suggesting that user-friendly technical developments could have an effective impact on the quality of healthcare. **(39,40)**

3. **Promoting Reporting Culture**

A culture of safety can be promoted by establishing a non-punitive atmosphere that promotes reporting without fear of blame or legal implications. This is essential for identifying and addressing systemic issues that compromise patient safety. **(41,42)**

Studies have shown that punitive reporting systems are associated with under-reporting and may reflect a culture of blame, hindering the identification of factors contributing to safety concerns (Feeser et al., 2020). Conversely, nonpunitive reporting is linked to a positive safety culture, where the focus is on learning from events to improve safety. **(43,44)**

The literature supports the notion that a non-punitive environment is conducive to a culture of safety by promoting open communication and reporting of adverse events.

By using this strategy, healthcare institutions can enhance patient safety and learn from mistakes.

4. **Education of Patients: -**

Patient safety can be increased by teaching patients the value of reporting adverse reactions and the appropriate procedures for doing so.

Pharmacists should extend their role from just dispensing to a responsible pharmacist who is willing to inform patients about the expected therapeutic effects, dosage regimen, directions for use and possible side effects of drugs.

Conclusion

Reporting of ADRs and ADEs is a fundamental aspect of ensuring patient safety and advancing pharmacovigilance. Despite the obstacles, promoting reporting practices through education, streamlined systems, and a nurturing reporting culture can lead to substantial improvements in drug safety. Detailed and precise reporting of ADRs/ADEs not only aids in

pinpointing and addressing risks, but also contributes to the development of safer medications, better prescribing practices, and improved patient outcomes. By emphasizing and enhancing ADR/ADE reporting, healthcare systems can guarantee higher standards of care and build trust among patients and providers.

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