

## Review

**Importance of ADR Monitoring in Elderly Population- A Review**Lakshmi Prasanna.T<sup>1</sup>, Stalin.C<sup>1</sup>, Rajesh Kumar.G<sup>2</sup><sup>1</sup>Patient Safety- Pharmacovigilance Associate, Pharmacovigilance programme of India (PVPI), Indian Pharmacopoeia Commission.<sup>2</sup>Assistant Professor, Dept. of Pharmacology, Govt. Kilpauk Medical College- Chennai.

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The need for the use of drugs in the elderly population has increased in recent times. Polypharmacy due to multiple diseases and potentially inappropriate medications is common in the elderly. Hence the elderly patients are more prone to develop drug-drug interactions (DDI), drug disease interactions (DDE) and adverse drug reactions (ADR) than younger patients. Moreover medications are brought to market with limited information regarding the safety profile in these special populations. During pre-marketing clinical phase the studies are conducted in small number of people, particularly excluding the elderly patients. This article concludes that there is a need for health care professionals to pay special attention to Identify the adverse effects and reporting them in order to maintain a favourable risk-benefit balance.

**Keywords:** Adverse reactions; Elderly; Polypharmacy.**Introduction**

The World Health Organization defines adverse drug reactions (ADRs) as any noxious, unintended, and undesired effect of a drug, excluding therapeutic failures, intentional and accidental poisoning, and drug abuse [1]. Adverse drug reactions represent a major burden in the community causing significant morbidity, mortality, and health care costs [2]. Reports show that the hospital admissions due to ADRs have ranged from 6% to 12% of all admissions in older patients. The main reasons for ADR-related admissions were advanced age, Polypharmacy, comorbidity, and potentially inappropriate medications. Among the elderly people, individuals can vary greatly from others of a similar age in terms of health, disability and physiologic reserves [3]. For this reason, The International Conference on Harmonization considers older people a 'special population', as they differ from younger adults in terms of comorbidity, Polypharmacy, pharmacokinetics and greater vulnerability to adverse drug reactions [4]. Hence it is important to show special attention to prevent ADR-related hospitalization in older patients.

**Altered Metabolism**

Ageing is associated with physiological changes that affect how medicines are handled, including alterations in Absorption, volumes of drug Distribution, Metabolism and Clearance which can prolong half-life resulting in the increased potential for drug toxicity and the likelihood of adverse drug reactions. Elderly patients may also

have altered drug responsiveness, due to reduced homeostatic reserve in different organ systems. The main contributors to altered pharmacokinetics are changes in organ mass and its function like Reduction in liver size, deterioration in renal function etc [5].

**Type of ADR's**

The majority of ADRs in older people are Type A reactions i.e. they are attributable to a predictable known pharmacological effect of a drug. Type A adverse drug reactions are usually avoidable and typically involve commonly prescribed medications [6].

**ADRs causing hospitalization**

Advancing age can contribute to a significant increase in sensitivity to particular drugs and a corresponding increase in the incidence of ADRs [7]. Older patients demonstrate an exaggerated response to central nervous system-active drugs (eg, benzodiazepines, anesthetics, opioids) and a decreased response to some cardiovascular agents (eg, beta-adrenergic agents)[8]. Also, the most important pharmacokinetic changes in older people include a decrease in the excretory capacity of the kidney, rather than a decline in the rate of hepatic drug metabolism [9]. The most frequent ADRs causing hospital admission in older patients are typically gastrointestinal disorders and cardiovascular and metabolic/ endocrine complications. A summary is shown in Table 1.

Most common ADRs	Examples
Gastrointestinal complications	Gastrointestinal bleeding, peptic ulcer, erosive gastritis, nausea, vomiting
Cardiovascular disorders	Hypotension, bradycardia, falls, arrhythmias
Metabolic/endocrine Complications	Hypoglycemia
Renal and urinary Disorders	Renal impairment, acute renal failure
electrolyte disorders	Hypokalemia, hyperkalemia, hyponatremia
Nervous system Disorders	Depressed level of consciousness, mental status changes

Table 1: Most common ADRs causing hospitalization in the elderly

## Conclusion

It is clear that older patients are at significant risk for ADRs and many such ADRs occurring in this population are considered preventable. Pharmacokinetics change with ageing and drug doses often need adjustment to avoid adverse drug events. Good communication between healthcare providers and patients or patients caretaker is key to managing medicines well.

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