

EDITORIAL

RISK FACTORS FOR EARLY PREDICTION OF ADVERSE DRUG EVENTS RELATED TO HOSPITALIZATIONS

FACTORES DE RIESGO PARA LA PREDICCIÓN DE EVENTOS ADVERSOS DE MEDICAMENTOS RELACIONADOS CON LA HOSPITALIZACIÓN

The prevalence of hospital admissions because of possible adverse drug events (ADEs) vary from 0.56% to 54.5% in Brazil. In addition, nearly 43% of inpatients may develop adverse drug reactions (ADRs) during their hospital stays (1, 2). Clinical outcomes arising from drug-related problems are almost never identified by health professionals because the signs and symptoms are nonspecific and may mimic pathologies (1-3).

The failure of primary and secondary health care providers to identify ADEs in a timely fashion results in inappropriate management by therapeutic guidelines and clinical treatments (1, 2). Health professionals should be aware of the risk factors related to ADEs, the drugs involved, and clinical manifestations. This would allow them to predict side effects and improve patient safety.

Overall, the primary risk factors associated with hospitalizations arising from ADRs are (1-5):

- a) Age: The elderly and children are more susceptible to the negative effects of drugs because of their peculiar physiologic characteristics.
- b) Sex: Women have a greater predisposition toward ADEs. Several explanatory hypotheses include hormonal and cultural differences.
- c) Polypharmacy: The concomitant use of multiple drugs increases the risk of ADEs. Concurrent prescriptions for several drugs increase the likelihood of drug interactions, complex therapeutic regimens, and non-compliance with pharmacotherapy.
- d) Tobacco and alcohol use: Participation in these social practices may interfere with pharmacokinetics and pharmacodynamic parameters.
- e) Specific pathologies: Patients with liver or kidney diseases are more susceptible to the effects of drugs. Therefore, dose adjustments are necessary to avoid ADRs.

Several therapeutic classes of drugs are responsible for ADEs. For instance, omeprazole, analgesics, antihypertensive agents (captopril), insulin, simvastatin, and formoterol have been identified as the primary drugs related to hospitalizations for drug-related problems (1-3). In one of ten inpatients, the use of drugs with narrow therapeutic ranges is associated with hospital admissions for possible drug interactions (5).

The length of hospital stay is also an important issue related to ADEs and hospital admissions. Data show that inpatients diagnosed with ADRs stay three days longer than others (6). Findings portray three situations: 1) patients stayed longer because of the failure to detect ADRs; 2) events were classified as serious, demanding more complex treatments; or 3) management of the identified problem was inappropriate.

Few economic studies on the impact of ADEs in Brazil have been conducted (7). In 2005, the Hospital Information System of the Unified Health System (SIH/SUS) recorded 21,500 hospitalizations (59 admissions daily) from problems associated with drug use. Total cost was R\$8,300,000 (US\$2,500).

Pharmacoeconomic studies showed that deployment of strategies to prevent ADEs reduced the costs to health institutions by 13.7% to 30% (4). These strategies promoted active searches for ADEs,

management of patient safety using multidisciplinary teams, use of computers to detect ADE risks, and educational interventions.

As a consequence, the number of ADEs related to hospital admissions may be used as a quality indicator of the health care provided in primary and secondary settings. Additionally, implementation of pharmaceutical care programs at these levels may contribute to the prevention and/or reduction in the prevalence and incidence of potential and real drug-related problems and their negative clinical outcomes. Therefore, the impact to public health will be mitigated because the practice of pharmaceutical care could contribute to minimizing morbidity and mortality resulting from pharmacotherapy, overhead in the tertiary sector of hospitalizations related to the use of drugs, and unnecessary spending by health institutions on preventable events.

Patricia de Carvalho Mastroianni, Fabiana Rossi Varallo

School of Pharmaceutical Sciences, Department of Drugs and Medications, Araraquara/SP, Brazil, Universidade Estadual Paulista Júlio de Mesquita Filho (UNESP) patriciamastroianni@yahoo.com.br

REFERENCES

1. Mastroianni PC, Varallo FR, Barg M, Noto AR, Galduróz JCF. Contribuição do uso de medicamentos para a admissão hospitalar. *Braz J Pharm Sci.* 2009 Jan-Mar; 45 (1): 163–170.
2. Varallo FR, Planeta CS, Mastroianni PC. Hospitalização por reações adversas a medicamentos: a importância da farmacovigilância para detecção dos fármacos envolvidos, dos fatores de risco e dos resultados clínicos negativos à saúde do paciente. *Perspectiva* 2010 Nov; 11 (13): 50-59.
3. Varallo FR, Capucho HC, Planeta CS, Mastroianni PC. Possible adverse drug events leading to hospital admission in a Brazilian teaching hospital. *Clinics (São Paulo)* 2014 Mar; 69 (3): 163-167.
4. Varallo FR, Mastroianni PC. Farmacovigilância para promoção do uso correto de medicamentos. Porto Alegre, Brasil: Artmed; 2013, 184p.
5. Varallo FR, Costa M, Mastroianni PC. Potenciais interações medicamentosas responsáveis por internações hospitalares,” *Ver Ciênc Farm Básica Apl.* 2013 Jan-Mar; 34 (1): 79–85.
6. Hug B, Keohane C, Seger D, Yoon C, Bates D. The costs of adverse drug events in community-hospitals. *Jt Comm J Qual Patient Saf.* 2012 Mar; 38 (3): 120-126.
7. Mastroianni PC, Abjaude SAR, Varallo FR. Avaliações farmacoeconômicas em vigilância de medicamentos. *Rev Saude Cien Online* 2014; 3 (2): 43–57.