Farm Hosp. 2011;35(5):236–243

Farmacia HOSPITALARIA

www.elsevier.es/farmhosp

ORIGINAL ARTICLE

Adverse Drug Reactions Which Provoke Hospital Admission☆

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Received 17 May 2010; accepted 8 August 2010

KEYWORDS
Adverse drug reactions;
Medication errors;
Pharmacotherapy monitoring;
Iatrogenic disease-Epidemiology;
Cost;
Emergency department;
Hospital admissions

Abstract
Objective: To identify, classify and quantify the frequency of negative clinical adverse drug reactions (ADR) resulting in hospital admission from the emergency department (ED). To determine ADR preventability, identify ADR-related admission factors, calculate related costs and recognise which drugs are the most often involved.
Method: Cross-sectional, prospective and observational study of patients who were admitted to hospital from the ED. We used the Dader method to detect ADR. We classified ADR in accordance with the Tercer Consenso de Granada (third Granada consensus), and calculated ADR preventability using the Schumock and Thornton scales (modified by Otero et al.), and ADR severity according to Schneider. We considered the direct costs generated during the hospital stay for the economic study. We analysed the correlation between ADR and age, sex, kidney and liver failure, and drug use. We used multiple logistic regression analysis to identify risk factors.
Results: 19.4% of admissions were the direct consequence of ADR, 65% of which were preventable. Antineoplastic therapy and immunosupressants caused 38% of ADR. 20.4% of admissions had to be transferred to the intensive care unit (ICU) or caused permanent damage. We found statistical significance between ADR and patients undergoing hormonal therapy, 'high risk' drugs and those admitted to the endocrinology department. The ADR-associated cost was €237,377.
Conclusions: ADR-related admission is a problem with a high prevalence, and most cases are preventable.

☆ Please cite this article as: Pérez Menéndez-Conde C, et al. Resultados negativos asociados al uso de medicamentos que motivan ingreso hospitalario. Farm Hosp. 2011;35:236–43.

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2173-5085/$ – see front matter

PALABRAS CLAVE
Resultados negativos asociados con la medicación;
Errores de medicación;
Seguimiento farmacoterapéutico;
Patología iatrogénica-epidemiología;
Coste;
Servicios de urgencias;
Ingresos hospitalarios

Resultados negativos asociados al uso de medicamentos que motivan ingreso hospitalario

Resumen
Objetivo: Identificar, clasificar y cuantificar la frecuencia de los resultados clínicos negativos asociados al uso de medicamentos (RNM) como motivo de ingreso hospitalario desde el servicio de urgencias (SU). Determinar el carácter prevenible de los RNM, identificar factores que predisponen al ingreso por RNM, determinar los costes asociados y conocer qué medicamentos se ven implicados con mayor frecuencia.
Método: Estudio transversal, prospectivo y observacional en pacientes que ingresaban desde el SU. Se aplicó el método Dáder para la detección de RNM. Los RNM se clasificaron según el Tercer Consenso de Granada, la evitabilidad se determinó aplicando el algoritmo de Schumock y Thornton, modificado por Otero et al. y la gravedad según Schneider. Para el estudio económico se consideraron los costes directos generados durante el ingreso. Se analizó la asociación entre los RNM y edad, sexo, insuficiencia renal y hepática, y consumo de medicamentos. Se utilizó la regresión logística múltiple para identificar los factores de riesgo.
Resultados: El 19,4% de los ingresos fueron consecuencia directa de RNM, siendo evitables el 65%. El grupo de terapia antineoplásica e inmunosupresores causó el 38% de los RNM. El 20,4% de los ingresos requirieron traslado a la UCI o provocaron daño permanente. Se encontró una asociación estadísticamente significativa entre los RNM y los pacientes en tratamiento con terapia hormonal, fármacos de «alto riesgo» o ingresados en el servicio de endocrinología. El gasto ocasionado por los RNM fue de 237.377 €.
Conclusiones: Los ingresos por RNM son un problema de elevada prevalencia, y la mayoría son evitables.

Introduction

Adverse drug reactions (ADRs) are events which can affect the health of people who consume drugs for therapeutic, diagnostic or prophylactic purposes.[1] An ADR, or a combination of multiple ADRs, can lead to treatment failure or even trigger new medical problems which may be as harmful as the original disease being treated.[2]

Morbidity associated with drug treatment is a severe public health problem that creates a significant demand for care and generates high healthcare costs. It is one of the leading causes of death in developed countries.[3]

According to data from various authors, the frequency with which ADRs appear is between 2.6% and 50%.[4–6] Santamaría-Pablos et al. state that 16.6% of all hospital admissions are primarily caused by an ADR.[7]

Regarding mortality, a study carried out in the United States listed drug-induced iatrogenesis as between the fourth and the sixth most common cause of death in hospitals,[8] meaning that between 43 000 and 98 000 patients die yearly as the result of a medication problem.[9]

Meanwhile, ADRs take a heavy toll on health and social resources, that increases both hospital stays and their associated costs.[10,11] In the hospital context, Bates et al.[10] and Classen et al.[11] calculate that the direct costs generated by ADRs in hospitals in the United States range between 1.6 and 4bn dollars per year.

Data published in the literature coincide in stating that ADR can be avoided in most cases. It is estimated that up to 80%[12,13] of ADRs are avoidable or preventable. Gaining a better knowledge of ADRs and the factors that tend to cause them will therefore contribute to detecting them at an earlier point in time. As a result, patients will have fewer health problems and enjoy better quality of life.[14]

In general, results from different studies on ADR are difficult to extrapolate to the general public, as they are gathered from very concrete contexts with reduced number of patients. In contrast, hospital emergency departments (ED) allow us to study larger number of patients. Even more importantly, they provide data that approach the likely situation in the general population, which is a crucial step towards identifying and preventing drug-induced iatrogenesis.[15,16]

Although some studies have analysed adverse drug effects in patients attended to in the ED,[5,13,17,18] few studies evaluate ADRs that result in admission to hospitals. Such studies would be extremely useful for detecting the most severe incidents that occur in the primary care setting, where more than 90% of all medications are prescribed.

The main aim of this study was to identify, classify and measure the frequency of the adverse drug reactions that lead to hospital admissions through the ED.

Our secondary objectives are to determine how preventable ADRs are, identify factors that make patients more likely to be admitted due to ADR, determine costs associated with admissions of this type and which medications are the most frequently involved.

Method

Cross-sectional, prospective, observational study was done over a 12-month period.