Incidence of Adverse Drug Reactions in Alkarak Hospital: A Pilot Study

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Abstract

Objective: Adverse Drug Reactions (ADRs) are common and represent a major clinical issue. The majority of ADRs are mild, however, sometimes can be severe and cause death, lead to extend the length of stay in hospitals, and increase the health care costs. The aim of this prospective observational study was to assess the prevalence and impact of ADRs in Alkarak hospital.

Methods: The study was carried out on two hospital wards (internal medicine and Intensive Care Unit (ICU). Patients admitted to these wards over a 4-week period were assessed for ADRs through a daily ward visit. Suspected ADRs were recorded and then analyzed for causality, severity and possibility of avoidability.

Results: Sixteen out of 200 patients (8%) suffered from one or more ADRs. Most ADRs (n=11, 68.8%) were classified as type A (Augmented) reactions. Causality assessment showed that 12 (75%) of the ADRs were defined as "probably drug-related", while 4 (25%) were classified as "possibly drug-related". Two (12.5%) of the reactions were assessed as "definitely avoidable", whereas 6 (37.5%) were classified as "possibly avoidable". One patient died during admission and his death was contributed to an ADR.

Conclusions: ADRs are an important cause of morbidity and mortality. Many of these reactions may be preventable. Measures are needed in order to detect, prevent these adverse reactions, and therefore reduce the burden caused by ADRs on health care system and improve drug safety.

Keywords: Adverse Drug Reactions**,** Adverse Effects.

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Introduction

Adverse Drug Reactions (ADRs) are common and represent a major clinical problem. Although many ADRs are mild, sometimes they can be severe, life-threatening and can cause death. [1] It is an important issue for the detection and prevention of ADRs to recognize the factors that may predispose to ADRs. Many factors may predispose an individual to ADRs and these include age, sex, environmental factors, multi-drug therapy, drug-drug interactions and genetic factors. [2- 3] ADRs are more likely to develop in the elderly which may be related to decrease their metabolism of drugs**.** [4- 5] In addition, the incidence of ADRs is more likely to increase in patients with liver diseases and in patients with impaired renal function**.** [6] ADRs can cause patients to be admitted to hospitals or may occur after admission to hospitals.

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Furthermore, ADRs increase the length of hospitalization of patients and the costs of patient care in hospitals. [7] In the United Kingdom, it has been estimated that ADRs cost the National Health Service (NHS) of approximately £0.5 billion annually. [8] Moreover, ADRs are of major concern to many pharmaceutical companies. ADRs are the most common causes of drug withdrawal from the market.[2] In the United Kingdom, about 4% of drugs introduced in the market between 1974 and 1994 had to be withdrawn because of ADRs. [9] The aim of this pilot study was to assess the incidence and impact of ADRs in Alkarak Hospital.

Methods

Patients Identification and Assessment

This pilot study was conducted on two wards (internal medicine and Intensive Care Unit (ICU)) of Alkarak Hospital. Informed consent was obtained from each participant. Patients admitted to these wards over a 4-week period in June 2008 were assessed for ADRs. The two wards were attended daily by a clinical pharmacologist. Medical notes of patients were reviewed. All patients with suspected ADRs were interviewed to obtain further details about the reactions, and drug details as well as the nature of the reaction which were recorded in an ADR reporting form. An ADR was defined according to the definition of the World Health Organisation (WHO) "any response to a drug which is noxious, unintended, and that occurs at doses normally used in man for prophylaxis, diagnosis, or therapy of diseases" and in accordance with the known adverse effect profile of the drug according to the Jordan National Drug Formulary. [10-11] ADRs were classified according to the classification of Rawlins and Thompson. Type A reactions are predictable, dose related and represent an augmentation of the known pharmacological effect of the drug. By contrast, type B reactions are bizarre or idiosyncratic, not dose dependent and cannot be predicted from the known pharmacology of the drug. [12]

Suspected ADRs were analyzed for causality using the Naranjo algorithm to determine the likelihood of whether an ADR is actually due to the drug rather than the results of other factors. [13] Assessment of avoidability of the ADRs was also performed using the criteria outlined by Hallas et al. [14] Severity of the reactions was determined using the Hartwig scale. [15]

Results

Sixteen of 200 patients (8%) experienced one or more ADRs. More male (n=9, 56.2%) than female (n=7, 43.8%) developed an ADR. The median age of patients who suffered an ADR in this study was 45 years. Most ADRs (n=11, 68.8%) were classified as type A reactions and 5 (31.2%) were type B reactions. Causality assessment showed that 12 (75%) of the ADRs were defined as "probably drug-related", while 4 (25%) were classified as "possibly drug-related". In term of prevention, 2 (12.5%) of the reactions were recognized to be "definitely avoidable", and 6 (37.5%) were classified as "possibly avoidable", while 8 (50%) of the reactions were assessed as "unavoidable." According to the Hartwig severity scale, most ADRs (n=11) required that treatment with the suspected drug should be discontinued, or otherwise changed but there was no need to increase the length of stay in hospital, no antidote or other treatment was required, and thus were classified at level 2. One adverse reaction led directly to death of one patient and therefore was classified as level 7. This ADR was classified as "definitely avoidable." A summary of the ADRs and their causative drugs are shown in Table (1). The most frequent reactions identified were gastrointestinal bleeding and increased anticoagulation associated with the use of warfarin and skin rash due to the use of antibiotics.

Table (1): Drugs implicated in causing ADRs.

Drug	***No (%) of cases***	***ADR***
Warfarin	*3 (18.8)*	*Lower GI Bleeding, high INR*
Diclofenac	*2 (12.5)*	*Skin rash, itching, shortness of breath, renal impairment*
Ranitidine	*2 (12.5)*	*Skin rash, itching, dyspnea*
Piroxicam	*1 (6.3)*	*Lower GI Bleeding leading to death*
Metylase	*1 (6.3)*	*Subconjuctival hemorrhage*
Fexofenadine	*1 (6.3)*	*Itching, urticaria, shortness of breath*
Cefuroxime	*1 (6.3)*	*Skin rash*
Ciprofloxacin	*1 (6.3)*	*Skin rash*
Maxipime	*1 (6.3)*	*Skin rash*
Dopamine	*1 (6.3)*	*Nausea, tachycardia*
Glyceryl trinitrate	*1 (6.3)*	*Hypotension*
Prednisolone	*1 (6.3)*	*Constipation, cushignoid face (moon face)*

GI=gastrointestinal bleeding, INR=international normalized ratio.

Discussion

Adverse drug reactions represent a significant cause of morbidity and mortality. Data relating to ADRs are often poorly documented in medical notes and may not be recognized by healthcare professionals.[16] Moreover, there are no data on the epidemiology of ADRs in Jordan. Therefore, this pilot study was conducted to investigate the incidence and impact of ADRs in Alkarak Hospital. According to our results, 16 out of 200 (8%) patients experienced an ADR. This figure is consistent with previous studies published in the literature. In the UK, a prospective analysis of 18,820 patients showed that 6.5% of hospital admissions were due to ADRs, ADRs led directly to admission in 80% of cases, 72% of ADRs were classified as avoidable; and the overall death rate was 0.15%.[8] A meta-analysis of 39 prospective studies by Lazarou et al. suggested that 6.7% of hospital inpatients experienced serious ADRs, ADRs caused over 100 000 deaths, and thus ADRs were ranked between the fourth and sixth leading causes of death in the United States in 1994.[17]

Although 8% of patients in this study developed an ADR, the majority of the reactions were mild and required only the suspected drug to be discontinued. Most ADRs identified were type A reactions (68.8%), which can be predicted from the known pharmacology of the drug and 50% of the reactions were classified as "definitely or possibly avoidable". Our results are in consistence with previous reports in the literature. A recent study by Davies et al. showed that 24 out of 125 (19%) patients developed ADRs as in-patients. They reported that 60% of these ADRs were definitely or possibly avoidable. [18] Therefore, in order to recognize ADRs, measures need to be deployed to detect, prevent these reactions and ultimately reduce the incidence and burden of ADRs on health care system. Prevention of ADRs requires familiarity with the drug and potential adverse effects. Physicians should report most suspected ADRs. Nurses, pharmacists, and other health care professionals should also report ADRs. Better communication between health professionals and patients about benefits and the potential risks of medicines is essential. Forms and information about reporting ADRs should be available in hospitals, primary care centres and clinics. Only through such reporting can suspected ADRs be identified and investigated. A larger prospective multicentre study is needed to provide a better estimate of the burden of ADRs on the health care system in this country.

In conclusion, the importance of ADRs is often underestimated. They are common and can be life threatening. Vigilance by all health care professionals in detecting, diagnosing and reporting ADRs is important for reducing the incidence of ADRs and improving drug safety.

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الآثار الجانبية للأدوية في المرضى داخل مستشفى الكرك الحكومي

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الملخص

الهدف: معرفة مدى انتشار الآثار الجانبية للأدوية في المرضى داخل مستشفى الكرك الحكومي.

الطريقة: أجريت هذه الدراسة على200 مريض أدخلوا في قسم الباطنية العامة وقسم العناية المركزة خلال فترة 4 أسابيع في شهر 2008/7 تمت معاينة المرضى الذين حدثت لهم آثار جانبية بعد استعمال الدواء من قبل الطبيب الأخصائي ثم قام الطبيب الباحث بتسجيل معلومات عن جميع الأدوية التي استخدمها المريض والأعراض التي حدثت بعد تناول الدواء. تم تحليل العلاقة بين الدواء المسبب والأعراض مدى خطورة هذه الأعراض وإمكانية تفاديها.

النتائج: تبين أن 16 مريضاً من اصل 200 (8%) قد حدثت لهم أعراض جانبية نتيجة استعمال الأدوية. 68% من هذه الآثار كانت من نوع (A) وهي الآثار التي يمكن التنبؤ بحدوثها من طريقة عمل الدواء. 75% من الآثار الجانبية كان لحدوثها علاقة بالدواء.

12.5% من الآثار الجانبية كان من الممكن اجتنابها او تفاديها. وقد أدت الآثار الجانبية مباشرة إلى وفاة احد المرضى.

الخاتمة: معظم الأدوية لها آثار جانبية غالبا تكون ليست بالخطرة ولكن في بعض الأحيان قد تكون خطيرة وأحياناً قد تسبب الوفاة .

توصيات للتقليل من نسبة حدوث هذه الأعراض

1. يجب على الأطباء والكادر الطبي معرفة أهمية هذه الأعراض ومدى خطورتها وتوقع حدوثها.
2. التقليل من عدد الأدوية المعطاة للمريض وإعطاء المريض اقل جرعة ممكنة خاصة كبار السن والأطفال.
3. توفير استمارة في أقسام الطوارئ وجميع الأقسام في المستشفيات والمراكز الصحية والعيادات الخارجية تعبأ عند حدوث آثار جانبية نتيجة استعمال الأدوية، تشمل نوع الدواء والجرعة التي أعطيت وجميع الأدوية التي استعملها المريض والأعراض الجانبية التي حدثت بعد تناول الدواء.

الكلمات الدالة: الآثار الجانبية للأدوية، الأعراض الجانبية.