

Ensuring patient safety in an emergency primary health care service

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Objective: Clinical safety and the risks affecting patients in their relations with the health care system have long been discussed in the health sciences. Certain settings, such as critical care units, are highly susceptible to error because of the many drugs and procedures they manage. Our main objective was to initiate analysis of adverse events in an emergency primary health care service, as well as to facilitate the identification and prevention of such events.

Methods: A working group was formed in November 2007 in our emergency primary health care service and charged with defining situations in which there is risk of adverse events, preventing such events, and analyzing and correcting those that occurred with a view to making ongoing improvements in patient care. We undertook a retrospective study of adverse event reports in 2008.

Results: We attended 75 525 consultations, and found 11 incidents (0,15‰). Nine were caused by errors in identifying the onset of the episode (referral errors) and 2 were events with scarce clinical consequences.

Conclusions: Mistakes in identifying the onset of a clinical episode or relevant medical history are the most common type of event. This error generates the need for an emergency department visit that could have been avoided if the error had been corrected in time. [Emergencias 2009;21:415-421]

Key words: Clinical safety. Adverse events. Emergency primary health care services.

Introduction

The clinical safety of patients or risks to which they are exposed while using the health system have often and long been addressed in the development of health science. The Hippocratic dictum *Primum non nocere* is a clear reference to professional concern about this topic since antiquity. There are studies on clinical safety studies dating from all epochs, and especially as from the work of Codman in 1911. They use the concept of iatrogenic outcome (unexpected result due to the natural evolution of the disease)¹. A Canadian study² noted that the model of a developed primary care system and greater accessibility explained the increase in adverse events (AE) the authors recorded in the pre-hospital period as compared to American studies, although the influ-

ence of being a referral hospital can not be ruled out. Other studies³ concur that the highest percentage of negligent AE (52.6%) are found in the Emergency Department (ED). In a model with developed primary care, a high proportion of AE related with the use of drugs is also expected⁴. Another study⁵ analyzed 49,345 complaints against primary care physicians. More than half were related to events occurring in outpatient care settings, but serious consequences were more likely when the event took place in a hospital. In our country, the largest study to date on AE in primary care is the APEAS study⁶ which established the prevalence of AE as 18.6%, 48% of which were related with drugs, 25.7% with care, 24.6% with communication, 13.1% with the diagnosis, 8.9% with management and 14.4% due to other causes. In their conclusions the authors empha-

sized that primary care health practice could be considered reasonably safe, and the frequency of AE was low and predominantly slight.

The most important aspect in avoiding errors is awareness of the dangers inherent in act of care, especially for certain age groups or physical or mental situations, and in some care units⁷. Certain units, such as critical care, are more prone to errors because of the many drugs and procedures used, and the impossibility of patient involvement when unconscious.

The concept of adverse event or error must be distinguished from other similar related expressions with different implications. Thus we can speak of an incident as something that is not predictable or preventable but generally does not entail serious consequences for the patient, although it may sometimes result in an AE. We can also use the word accident referring to an event that is not predictable or preventable, but that has consequences for the patient. When we speak of an error or adverse event we refer to a circumstance that is predictable and preventable and that has consequences for the patient. The notion of error or adverse event involves damage, unintended injury or complication resulting in disability at the time of care, death or prolongation of the process, which is more correctly attributable to health care procedure than the underlying disease. It includes acts of omission (failure in diagnosis or treatment), acts of commission (incorrect treatment or care) and AE derived from material or organizational failure.

Our purpose in this paper is to describe our experience in the process of analyzing AE emergency primary care and, further, to promote the identification and prevention of AE. The following text is an analysis of our one-year results in this endeavour.

Method

In November 2007, we created a working group within the clinical emergency unit of our health centre to define and prevent health risk situations where AE may occur, analyzing and correcting those AE that did occur, in the context of continuous improvement of quality of care.

The group performed a search of the literature on methods of AE detection and analysis as well as preventive measures (especially those related to primary emergency care) in Medline, Metabuscador Excelencia Clínica, Iberoamerican Cochrane Center and the website Patient Safety and Error in

Medicine, Epidemiologic Research Institute, National Academy of Medicine in Argentina (www.errorenmedicina.anm.edu.ar). Key words used in the search included "seguridad del paciente", "atención primaria", "urgencias de atención primaria", "patient safety" and "emergency primary care". The vast majority of these referred to hospital settings, many on primary care in general (referring to AE related with medication and chronic treatment drug interactions), some on the impact of emergency care in primary care in the AE reported by hospitals, and none specifically dealing with AE in emergency care in primary healthcare.

Subsequently, in January 2008, we organized a clinical training session for all emergency care professionals where the results of the study group were delivered and the importance of AE highlighted.

Emergency care at our health centre is provided by 18 specific professionals (5 physicians, 5 nurses, 4 guards and 4 medical transporters) of whom only 40% attended the training session (two physicians and two nurses) and 30 occupational health centre professionals [15 physicians and 15 nurses constituting the Primary Care Basic Team (EBAP)] of whom only 20% attended the training session (4 nurses and 2 doctors).

For the identification and prevention of AE we used "Healthcare Failure Mode Effects and Analysis" (HFMEA)⁸, a method for planning and identifying areas of health care where AE are caused. It is a prospective and systematic method to identify and prevent procedural problems (Failure Mode: different ways in which a process or sub-process may fail and lead to a negative result). The HFMEA method calculates an approximate estimate of AE risk in the unit, so that preventive measures can be established.

Given the same AE, the impact on the patient may be of different magnitude (depending on certain biological, psychological and sociocultural factors), and may lead to the development of new AE. Among these risk factors for the development of possible AE, the working group stressed the biological, psychological, emotional and sociocultural factors outlined in Table 1.

To identify the likely places of AE occurrence and possible causes, the working group traced the map of care activities in our emergency department: patient reception, wound-dressing room, short treatment area and evolution⁹, critical care room, attended transport and others (Table 2).

For the analysis of the various AE, there are different research methods and systems¹⁰, including

Table 1. Risk factors associated with patient

Biological factors:	Age. Previous pathologies. Neurological and motor. Sensory deficits. Previous drug treatments. Drug allergies.
Psychological and emotional factors:	Psychiatric disease. Stress.
Socio-cultural factors:	Consumption of alcohol and other drugs. Language and language disorders. Family relations.

epidemiologic methods (retrospective, prospective and transverse), systems analysis, the critical incident technique or root cause analysis (RCA). The latter we considered the most complete and adaptable to the process of emergency care in our analysis. The RCA¹¹⁻¹³ is a sequential process of structured questions to discover underlying latent errors in a clinically relevant AE. It involves a comprehensive review of the constituent elements (people, equipment, procedures, information, environments, external contingencies, etc.). A root cause is one that if eliminated could prevent or lessen the likelihood of recurrence of an AE. Frequently, in health care, a single root cause or source of error is not enough to cause an incident or an AE; a combination of several circumstances or factors that trigger the event is frequently necessary.

All members of the emergency unit and other professionals somehow temporarily involved in it, even in the form of reinforcement, were asked to notify, verbally or in writing, any AE observed during the care process. We performed a retrospec-

tive descriptive analysis of all AE notifications during the year 2008.

We also performed a review of 200 computerized clinical records (using random sampling with replacement) establish the presence of AE in revisits to the emergency room within 24 hours.

Results

During 2008, 75,525 emergencies were attended in the clinical unit, of which 72,735 were treated at the health centre and 2,790 were attended externally (home or public area). In the month of April, hand-written clinical reports and/or histories were changed to a computer format using an electronic medical record, where the software recognizes the user by several items (name, surname, ID number, date of birth, Andalucía unique health history number, province of birth).

A total of 11 AE were verbally reported (0.15 per 1000), of which 9 corresponded to misidentification in the initial clinical episode (errors of affiliation) and two AE with slight clinical consequences.

Identification errors occurred in the administrative process of patient reception, due to incorrect use of the computer program attributable to lack of experience by the staff who only entered the patient's name and surname or opened an episode file for a patient with the same name as another but different age. Notification was verbal and the error was immediately corrected.

We recorded two AE in 2008 with slight clinical consequences. In both cases the notification

Table 2. Areas of emergency care with high probability of adverse effects

Reception	<ul style="list-style-type: none"> - Error in opening patient registration and medical history due to deficient patient identification. - Communication problems due to different languages. - Deficient help of disabled patients.
Wound dressing area	<ul style="list-style-type: none"> - Deficiency in patient immobilization and mobilization.
Short treatment and observation room	<ul style="list-style-type: none"> - Communication problems due to different languages. - Ensure patient safety on and off the examination table.
Critical care ward	<ul style="list-style-type: none"> - Procedural error. The most common procedures in this area are peripheral vein canalization, intravenous drug infusion, aerosol and oxygen therapy, and patient monitoring. - Erroneous dose or route of administration of a drug (as indicated). - Erroneous administration of drugs to patients not properly identified. - Use of defibrillator. - Aspiration of secretions. - Gastric lavage. - Endotracheal intubation.
Transport	<ul style="list-style-type: none"> - Objects and materials falling on the patient. - Accidental puncture by sharp objects (needles, catheters, medication vials). - Deficient boarding and securing of the patient. - Starting movement without sound and / or visual signals and inappropriate speed.
Others (all areas of care)	<ul style="list-style-type: none"> - Communication failure (between professionals and with patients). - Failure of equipment (obsolete or in poor condition and not reported). - Process failure (due to ignorance).

was made verbally and in writing, directed to the health management. The following is a description of the two cases.

Case 1: The AE occurred in the Short Treatment Area and was attributed to the use of defective "donated" clinical material (test strips for the determination of capillary blood glucose). The patient was a 60 year-old man with a history of hypertension and transient ischemic accident who consulted for sudden-onset vertigo. On arrival, vital constant determination found high blood glucose (505 mg/dl) that prompted the administration of rapid insulin, which produced hypoglycaemia after 15 minutes. After correction of the hypoglycemia, given the absence of a history of diabetes or family physician recommendations on low carbohydrate diet, the same "donated" strips were tested against our regular strips by medical personnel volunteers; significantly higher values were obtained with the "donated" strips.

Case 2: An 86 year-old patient with a history of unstable angina pectoris and generalized osteoarthritis consulted for chest pain. After an electrocardiogram performed in the critical care room, the patient wounded a leg on getting down off a stretcher bed, which was in fact supposed to be used for in-hospital transfer; it had hinged barrier rails for folding and the injury was produced by one of the hinges.

We would highlight the fact that that there were no AE recorded in the critical care area for advanced life support (ALS) procedures, although two patients required ALS with endotracheal airway intubation.

Regarding the review of computerized medical records for re-visits within 24 hours, no medication-related AE were recorded.

Discussion

The low rate of AE found in this study can be explained by the fact that we only considered AE in the context of emergency care and not total health centre activity, in contrast to the rates reported in other studies, such as APEAS, where this distinction was not made.

We consider that the total absence of written notifications on AE was due to the fear of administrative or judicial repercussion, as indicated by other authors^{14,15}. We are currently conducting a campaign on the importance of immediate AE notification in writing, because it enhances the credibility of what happened and facilitates investiga-

tion and correction, instead of waiting for administrative action days later after receiving the patient's complaint, or that of their families, where the professional has a propensity to act in an exclusively defensive way.

In our study, the most frequent AE was a patient identification error on opening a clinical event or medical history file (at patient reception), leading to a record of emergency attention of the wrong person. The measure of improvement adopted was to insist on the inclusion of date of birth (not just age in years) as part of the minimum data requirements for opening a clinical episode file.

In case 1, the cause of the AE was the use of "donated" material (brought to the centre by patients or their carers because the patient no longer needs it). This use is a frequent occurrence, generally considered to be risk free. In our centre we have now adopted the measure of not using such material, especially that which may deteriorate, without first being tested.

In case 2, there was an oversight in assisting the elderly patient move, by both medical (doctor and nurse) and the non-medical staff members. Given the current shortage of assistants in emergency units of health facilities, we believe it is incumbent on any staff member present to physically assist patients undergoing complementary tests (ECG, X-rays, sutures, etc.), especially those with limited mobility and autonomy, from the beginning of attention until it ends (including exit from the specific area of care).

Both cases resulted in a specific recommendation (an "ACR"). The "donated" strips were disposed of and the use of such material was prohibited unless previously tested. The provisional stretcher bed was to be kept in the open position and its hinges covered with cushioning material until replacement with the correct examining table without rails 5 days later.

Both cases needed attention, by medical treatment (case 1) and surgical treatment (case 2, suture). The proportion of these two AE was similar to that reflected in the APEAS study (17.1% in the APEAS study 2/11 or 18.8% in ours).

Analysis of re-visits within 24 hours showed that the main cause (1.6%) was short-lasting effect of treatment for acute pain (chronic joint pain and especially sharp and cramping renouretal pain) and chronic respiratory diseases (0.9%); but no re-visits for drug-related AE, despite this being the most frequent cause in another study¹⁶. We do not know of any AE attended in our reference hospital¹⁷, since there is no relevant

feedback channel., which has now been proposed to the Health District Management.

We believe that safety management of patients in emergency primary care centres is obligatory for both the health district management and the centre's professionals. Between us all, and applying a set of principles for work system improvement, we will achieve safer processes in emergency care and in patients presenting at the emergency room. Some of the recommendations for health managers include the need to: simplify care processes, reduce reliance on memory (using manual and computer reminders), improve access to information, especially to medical records of patients in other health areas in the district, attesting to relevant precedents in data assessment (eg. previous ECG, exacerbations of previously treated chronic conditions, drug intolerance, etc.), adjust work schedules to the setting (excessively long shifts may induce increased AE, especially in critical care¹⁸), establish professional profiles for emergency care^{19,20}; or facilitate tools to reduce AE due to patient-related factors, such as language barriers. In this regard, our emergency department uses medical history forms written in six languages (English, French, German, Chinese, Arabic and Russian)²¹.

Also, healthcare professionals should also participate in the management of patient safety, with more frequent use of the available tools, such as medical history, which is the document containing reviews and information on the clinical status and evolution of the patient during the process of health care (medical history is one of our patient registration tools, necessary to ensure continuity of care, improve quality of care and reduce the risk of AE); case discussion at specific clinical sessions (at one of the two sessions on AE it was decided to establish an "anaphylaxis kit" in the short-treatment and evolution area, given the frequency of intravenous treatments performed there), or adequacy of protocols by review and analysis. The principal value of a protocol is its contribution to the maintenance of health care quality using adequate resources, avoidance of scientifically unsubstantiated clinical decisions and reduction of incompetent variability in medical practice. The protocols indicate recommended actions, based on the updated and validated scientific knowledge; they are the result of consensus but do not establish rigid criteria or interfere with professional autonomy, but help physicians to act diligently.

In addition, healthcare professionals should actively participate in training, which should be

comprehensive, complete and continuous, since the management of emergency situations requires technical-medical and scientific expertise, reasoning power, security and speed in decision-making and good teamwork capacity. With respect to training in AE and clinical safety, we would stress the need not only for improved knowledge but also a change of attitude and communication skills, to facilitate AE analysis and prevention.

Voluntary communication systems, focussing on reporting "quasi-errors" and systemic factors that facilitate their appearance, would improve participation and favour the use of these systems in a non-punitive context to learn from mistakes made²².

Other medical organizations devoted to emergency medicine have taken important decisions about patient safety, including the American Academy of Pediatrics whose committee on pediatric emergencies insists on raising awareness about the issue and emphasizes the main safety measures (hand washing, reporting transfers, use of guides, etc.)²³.

Finally, the Spanish Society of Emergency Medicine (SEMES) in its Standards of Accreditation Manual for Primary Care Emergency Services²⁴, paragraph D regarding the Quality Program (points D4.1, D4.2 and D4.3), declares the need for systems for the detection, analysis and correction of accidents, errors, complications and adverse reactions. We believe this manual (as a whole) should be the reference material to improve emergency services planned and organized specifically for emergency attention in the primary care setting.

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Gestión de la seguridad del paciente en una unidad de urgencias de atención primaria

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Objetivo: La seguridad clínica o los riesgos a los que se someten los pacientes en función de su relación con el sistema sanitario han sido mencionados con mucha frecuencia en el desarrollo de las ciencias sanitarias. Ciertas unidades, como las de pacientes críticos, son más propicias a errores por la multitud de fármacos y procedimientos. El objetivo del estudio fue describir la experiencia en el análisis de los efectos adversos (EA) en urgencias de atención primaria y, aún más, propiciar la identificación y prevención de los EA antes de que estos ocurran.

Método: Creación de un grupo de trabajo en noviembre de 2007 en la unidad clínica de urgencias del centro de salud para definir las situaciones de riesgo donde se pueden producir EA, prevenir su aparición, analizar los que aparecen y corregirlos dentro de un contexto de mejora continua de calidad asistencial. Realizamos un análisis y estudio descriptivo retrospectivo sobre las notificaciones de EA durante el año 2008.

Resultados: Se atendieron un total de 75.525 urgencias, y en total se detectaron 11 EA (0,15‰), de los que 9 corresponden a errores de identificación en la apertura del episodio clínico (errores de filiación) y dos a EA con consecuencias clínicas leves.

Conclusiones: El EA más frecuente es el error de identificación en la apertura del episodio clínico o historia clínica, lo que conlleva (de no corregirse a tiempo) a la generación de un episodio de asistencia urgente a una persona que no le corresponde. [Emergencias 2009;21:415-421]

Palabras clave: Seguridad clínica. Eventos adversos. Urgencias de atención primaria.

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