

# Characteristics of deaths in a hospital emergency department

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## CONFLICT OF INTERESTS:

None

**Objectives:** To report clinical and demographic characteristics of patients who died in our hospital emergency department and to assess several aspects of medical care that could be improved.

**Methods:** Descriptive study of patients who died in the Emergency Department between January 1st and December 31st, 2006, excluding those patients who expired in the areas of pediatrics and gynecology. Demographic and clinical data, length of stay and location/placement of the patient at the time of death were recorded.

**Results:** Mortality rate was 0.2%. The most common type of patient was an elderly person whose death was expected. The most frequent cause of death was end-stage malignant disease and the median length of stay was 6 hours. Only 25% of patients undergone cardiopulmonary resuscitation manoeuvres. Prevalence of cognitive impairment was 32%. Patient location at the time of death was considered correct in most cases.

**Conclusions:** Given the significant ratio of patients with a terminal illness who die in the Emergency Departments, to enhance the transfer to more specific areas is mandatory. To design specific protocols for this group of patients is also desirable. [Emergencias 2008;20:113-116]

**Key words:** Mortality. Death. Emergency Services, hospital. Palliative care.

## Introduction

In recent years, there has been an increase in the number of patients that die in Hospital Emergency Departments (HED)<sup>1,2</sup>. This can be attributed to different causes, among which stand out: worsening of the pathology originating the visit, cases of sudden death and increasingly more frequently, deaths of patients that attend the emergency department (ED) in late stages of terminal illnesses. The socio-cultural changes experienced by Western society in the last decades have led to a growing number of dying patients being transferred to HEDs<sup>3-6</sup>. Moreover, there is the need for patients to remain in the ED due to a lack of beds in hospitalisation departments<sup>3,5,7</sup>. All of this contributes to an increase in the pressure on healthcare and on its organisation, as well as to the emergence of new needs related to the acquisition of knowledge to treat this type of patients<sup>8</sup>. Knowledge as to the real situation requires the creation of death registries in EDs.

A death registry was initiated in our ED seven and one half years ago and since 2004 this registry has included the circumstances of death and the appropriateness of the placement of patients in the ED.

The aim of this study was to describe the demographic and healthcare characteristics of patients that die in our ED as well as to analyse the points on how to improve healthcare and its organisation.

## Methods

A descriptive study of the patients who died in the ED of the Hospital Universitario del Mar, Barcelona, from January 1 to December 31, 2006 was performed excluding patients treated in the areas of paediatrics and gynaecology. All the medical reports and discharge reports were reviewed. We collected demographic data (age and sex), hours in the ED, frequency of attendance (visits to

the department in the last month), cause of death (both main and secondary diagnoses), presence of dementia, whether the patient was dead on arrival, if death was expected, if the patient was in the late stage of a underlying illness, if cardiopulmonary resuscitation (CPR) was carried out, if palliative measures were applied, if an autopsy (clinical or legal) was requested and if the placement of the patient in the department was adequate.

Causes of death were defined according to the International Classification of Diseases, ninth edition, clinical modification (ICD-9-CM). Expected death was considered when occurring in a patient in an advanced stage of a neoplastic illness or when presenting to the ED with bradycardia of less than 50 beats per minute or tachycardia of more than 150 beats per minute, hypotension with systolic blood pressure of less than 90 mm Hg, bradypnoea of less than 10 breaths per minute or tachypnoea of more than 30 breaths per minute and/or a decrease in the level of consciousness (Glasgow Coma Score < 10) without responding to treatment. A patient was considered in the terminal stage of illness when demonstrating disseminated neoplasia, advanced dementia, advanced pneumopathy or cardiopathy and a quality of life of less than 50 points in the Karnofsky index.

Adequateness of the placement in the ED was defined according to the structure of the department. Our ED consists of four separated healthcare areas. In the first area patients with mild medical conditions not requiring complex diagnostic techniques and whose discharge is expected to take place in a few hours (level I) are treated. The second area involves the treatment of mild surgical and traumatology pathologies (wound care area). The third area consists of 14 healthcare bays with one or two stretchers in each, in which severe medical and surgical cases are treated (level II). Finally, there is an area with 11 beds in individual bays where patients with the most serious conditions requiring observation (observation area) are managed. Patients were considered to be adequately placed if death occurred at level II since no longer than 12 hours had elapsed since their arrival to the ED, or at the observation area after that time had elapsed. Placement was considered to be inadequate if death occurred at level II more than 12 hours after arrival to the ED, and the transfer to a hospitalisation ward had not taken place due to lack of beds.

The descriptive analysis of frequencies was carried out with the SPSS programme version 13.0, with analyses of percentages, means and medians.

## Results

During the study period, a total number of 69,353 patients were treated with a total number of 144 (0.21%) deaths, among which 73 (50.7%) were men. The mean age of the deceased patients was  $77.98 \pm 13.9$  years. The length of time in the ED was a median of 6 hours, ranging from 0 to 86 hours. Sixteen percent of the patients had attended the ED in the month prior to death.

The most frequent cause of death was terminal stage neoplasia (10.4%), followed by pneumonia (9.7%) and acute myocardial infarction (9%). The diagnoses of all the patients are shown in Table 1. Fifteen point three percent of the patients were dead on arrival, with an unknown cause of death.

CPR techniques were carried out in 25% of the patients, most of whom were neither in a terminal stage of an underlying illness nor had dementia. Deaths were considered expected in 62.5% of cases, with 17.2% being in the terminal stage of an underlying disease.

Palliative measures were applied in 25% of cases, among which 19.4% were in the terminal stage of an underlying disease and 30.5 % had dementia.

Cognitive deterioration was observed in 32%.

Autopsy was requested in 27.8%, 22.1% of which were legal autopsies and 5.7% clinical studies.

Placement of patients in the ED was considered adequate at the time of death in 82% of the cases.

## Discussion

The overall mortality rate in our study was of 0.2%, clearly lower than that observed previously, both in this hospital<sup>9</sup> and in other studies published<sup>1,7</sup>. During the period from 1995 to 2000, the mortality rate in this hospital was of 0.9%<sup>9</sup>. This reduction might initially seem surprising, but it may be explained, at least in part, by the changes in the inclusion criteria in the current register, which omitted patients from paediatrics and gynaecology. If the same criteria used in previous years are applied, the total number of patients treated in the medical area was 30,643 with a total of 136 deaths, which would increase the percentage to up to 0.44%. The remaining difference could be attributed to a greater agility of the hospital circuits of referral to palliative care units, together with the prioritisation of admissions to hospitalisation wards of patients with terminal diseases.

**Table 1.** Main causes of death in patients in the ED

Main cause of death	N° of cases (%) (n = 144)
<b>Neoplasia</b>	
Terminal neoplasia	15 (10.4)
<b>Endocrinology and metabolic diseases</b>	
Complication of Diabetes Mellitus	2 (1.4)
<b>Diseases of the circulatory system</b>	
Acute myocardial infarction	13 (9)
Refractory heart failure	7 (4.9)
Disorders of cardiac rhythm	6 (4.2)
Ischaemic cerebrovascular accident	5 (3.5)
Brain haemorrhage	5 (3.5)
Pulmonary thromboembolism	2 (1.4)
Intra-abdominal haemorrhage	2 (1.4)
Aortic diseases	1 (0.7)
<b>Respiratory diseases</b>	
Pneumonia	14 (9.7)
Bronchial aspiration	7 (4.9)
Chronic pneumopathy	5 (3.5)
<b>Gastrointestinal diseases</b>	
Gastrointestinal bleeding	3 (2.1)
Hepatic failure	1 (0.7)
<b>Diseases of the urinary system</b>	
Urinary sepsis	4 (2.8)
Terminal renal failure	2 (1.4)
Genitourinary haemorrhage	1 (0.7)
<b>Diseases of the skin and of the subcutaneous tissue</b>	
Sepsis of soft tissues	2 (1.4)
<b>Injuries and poisoning</b>	
Stab wounds	1 (0.7)
<b>Poorly defined symptoms, signs and states</b>	
Septic shock	10 (6.9)
Unknown (dead on arrival)	22 (15.3)

Knowledge regarding the circumstances of death allows clarification of which deaths should have taken place in other healthcare areas which would have been more appropriate than the ED<sup>4,9,11</sup>. This would lead to improvement in healthcare support for terminal patients in their last days of life. Determining which patients should and should not die in the ED is nevertheless difficult, since in addition to strictly clinical factors, the socio-cultural change that has taken place should be taken into account in relation to who should provide care to the dying patient<sup>3,5,8</sup>.

The high percentage of patients who deceased due to a terminal disease (up to a 17.2% in this series), many of whom had a neoplastic disease, indicates the need to acquire knowledge about the type of care dying patients require from the treating physicians<sup>2</sup>. This type of care includes both pharmacological and non-pharmacological measures, as well as sedation guidelines<sup>10</sup>. In fact, on observing the results obtained in this study and the high number of patients requiring this type of management, a specific protocol on palliative measures was introduced in the hospital in February 2006.

In general, EDs are not prepared or adequate to offer a dignified death to this type of patients<sup>3-5,10</sup>.

**Table 2.** Clinical and demographic characteristics of patients that died in the ED

<b>Age, years (SD)</b>	77.98 (13.9)
<b>Sex</b>	
Men	57.7%
Women	49.3%
<b>Length of stay in ED</b>	
< 12 hours	72.7%
> 12 hours	27.73%
<b>Frequency of attendance</b>	
> 1 visit in the last month	16%
Only one visit in the last month	84%
<b>Cognitive deterioration</b>	
Yes	32%
No	68%
<b>Expected death</b>	
Yes:	62%
– Terminal stage	19.4%
– Advanced dementia	30.5%
No	38%

Since death was expected in more than half of the cases (62.5%), it would be advisable to have a space where patients could have more privacy to be with their relatives. In the present study up until an 18% of patients were considered to not have been adequately placed. On the contrary, the placement was considered adequate when the death occurred in the observation area. Patients with the most serious conditions were placed in that area and on worsening of their condition, more privacy was provided to the relatives to accompany the patients. An inadequate placement of patients whose deaths are expected is very often a consequence of insufficient bed availability, regardless of whether this is in the observation area or in conventional hospitalisation units once the diagnosis and treatment process in the ED has finished.

In conclusion, a considerable percentage of patients whose deaths are expected die in EDs. Therefore, referral circuits towards palliative care units, support at home or to speed up transfers to conventional hospitalisation wards must continue to be improved. And this will thereby improve the care provided to these patients in the last moments of their lives.

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## Características de los fallecimientos producidos en un servicio de urgencias

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**Objetivos:** Describir las características demográficas y asistenciales de los pacientes que fallecieron en nuestro servicio de urgencias hospitalario y analizar en qué puntos se podría mejorar la atención asistencial a este grupo de pacientes.

**Método:** Estudio descriptivo de los pacientes que fallecieron en el servicio de urgencias entre el 1 de enero y el 31 de diciembre del 2006, excluyendo los pacientes fallecidos en las áreas de pediatría y ginecología. Se recogieron datos demográficos y clínicos, así como el tiempo de permanencia y la ubicación del paciente en el momento del óbito.

**Resultados:** La tasa de mortalidad fue 0,2%. El perfil habitual fue el de un paciente de edad avanzada cuyo fallecimiento era esperado. La causa más frecuente de muerte fue la neoplasia en fase terminal y la mediana de permanencia en urgencias, de 6 horas. Únicamente se realizaron maniobras de reanimación cardiopulmonar en una cuarta parte de los pacientes. La prevalencia de pacientes con deterioro cognitivo fue del 32%. En la mayoría de ocasiones se consideró adecuada la ubicación del paciente en el momento de producirse su fallecimiento.

**Conclusiones:** Dado el porcentaje no despreciable de pacientes afectados de una enfermedad terminal que fallecen en los servicios de urgencias se debería mejorar los circuitos de derivación hacia unidades más específicas. También es conveniente la elaboración de protocolos específicos para este grupo de pacientes. [*Emergencias* 2008;20:113-116]

**Palabras clave:** Mortalidad. Fallecimiento. Urgencias hospitalarias. Lugar de la muerte. Cuidados terminales.