

Trends in hospital emergency department use

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None

Objectives: To describe trends in emergency department use at Hospital Virgen del Puerto in Plasencia, in the province of Caceres, Spain, over a 10-year period from January 1, 1998 to December 31, 2007. To determine the percentage of emergencies that led to admissions to this university hospital as well as the percentage of all admissions that came from the emergency department.

Methods: Descriptive, observational, retrospective study using hospital admission records to obtain the number of emergencies attended annually, the number of emergency patients admitted, and the number of admissions ordered by emergency department physicians. From the National Institute of Statistics, we also obtained the same information for all of Spain and for each Spanish autonomous community.

Results: Visits to the hospital's emergency department increased by 28.9% during the 10 years under study (annual increase, 2.8%). Increased use of the hospital was not correlated with the change in population, which fell by 3.8% during the same period. As visits to the hospital emergency department rose, the percentage of emergency patients admitted fell by 4%. Likewise, the percentage of all admissions from the emergency department also fell, by 9%. A similar pattern has been observed in Extremadura and in Spain.

Conclusions: Hospital emergency department visits increased during the 10-year study period, but the percentage of admissions ordered by emergency physicians decreased at Hospital Virgen del Puerto and in Spain as a whole. [Emergencias 2009;21:339-345]

Key words: Emergency department visits. Emergency hospital admissions. Emergency health services overflow.

Introduction

The use of hospital emergency department (ED) has increased significantly in recent years in all developed countries. In Spain, the number of ED visits increased from 4 million in 1983 to 16 million in 1993¹. This situation, as expected given its social importance, has been addressed by the media and political institutions. More than 10 years ago, the Ombudsman published a report on hospital emergency services outlining the plight of EDs and paced it at the forefront of the political agenda on healthcare reform and rationalization of these services. Following this report, INSALUD and autonomous communities invested heavily in structural reforms of most public EDs and some organizational changes, such as creating 24h emergency call points (ECP), implementation of centralized emergency systems and emer-

gency triage. However, the fundamental situations of the report (overcrowding and misuse) remain virtually unchanged.

Thus, some authors have recently noted that hospital emergency visits have risen from 18 million in 1997 to 25 million in 2005, with an annual growth of 4-5% not justified by the increasing population in the same period and did not appear to have altered despite the introduction of ECP and other interventions²⁻⁴.

Paradoxically, as the number of attended cases has increased, the number of hospital admissions from the ED has decreased. So, the increased frequency of ED use has been due, in part, to trivial or non-urgent cases^{5,6}, reaching 20-80% according to different studies^{7,8}. The data available support this: 10% of patients visiting the ED end up being admitted to hospital and 90 per cent are discharged home from the ED. Still, ED pressure

or the rate of emergency admissions to hospital remains high, above 65%⁹ (percentage of ED-referred admissions with respect to overall hospital admissions). This means that, for various reasons (excessive outpatient visits, overburdened central laboratory or radiology diagnostic services, appointment wait time) the ED remains the main gateway to the health system for a high percentage of cases requiring tests.

The objectives of this study were to describe the evolution of various indicators of emergency department attention (frequency of ED use, ED pressure and percentage of ED-referred hospital admissions) at the Hospital Virgen del Puerto de Plasencia during 10 years and compare the results obtained with figures for the rest of the community and the country.

Method

We performed a descriptive, observational, retrospective study using the hospital admissions data base to obtain the number of emergencies attended each year, total admissions and those derived from the ED. We also obtained the same data from the National Statistical Institute for national communities and for the country up to 2006, as those for 2007 were not available. The period covered by the study was from 1 January 1998 to 31 December 2007 and the study population was that with health cards belonging to the health area served by Hospital Virgen del Puerto. Plasencia is the seat of one of 8 health areas into which Extremadura is divided by the Health Service, in turn comprising 14 Health zones, serving a population of 114,000 inhabitants. The referral hospital in this area is the Hospital Virgen del Puerto, a second level hospital which became operational in 1975, for three health centres in the city and for the hospitals of Coria, Miajadas and respective Health Areas. It has 232 beds and is the teaching hospital for the specialties of family and community medicine, surgery, internal medicine and traumatology.

The variables studied (main indicators of emergency care) were:

- Number of emergency visits: the total number of emergency consultations carried out in a period of time. It is an indicator of activity and allows estimation of costs.

- Frequency of ED use: this is a measure of the number of ED cases attended in relation to the population served by the hospital. It enables comparative studies between centres of the same

group or hospitals with the same level and is used to evaluate the adequacy of resources. It is measured using the formula: number of ED visits in a given period/population census) x 1000^{10,11}.

- ED Pressure: this is one of the indicators of the quality of care and measures the relationship between ED-referred admissions and all hospital admissions, obtained by applying the formula: number of ED-referred admissions/total hospital admissions x 100^{10,11}; it should not exceed 55% to ensure adequate programmed activity of the hospital¹².

- Proportion of admissions: number of ED patients requiring hospital admission compared to all those attended. It is calculated by the formula: number of ED patients requiring urgent admission/total number of ED patients attended in a defined time period x 100¹³. This parameter gives indirect information about the complexity and/or severity of emergencies and the response capacity of the emergency department.

For statistical analysis, simple linear regression was applied to the data obtained, with statistical significance ($p < 0.001$).

Results

In 1998 there were 32,714 ED visits and in 2007 a total of 40,474 (Figure 1); the increase in these 10 years was 23.7%, representing an annual increase of 2.3%, although between 2006 and 2007 this was 6.1%. This is not explained by population growth because from 1998 to 2007 the population of the Plasencia health area has decreased by -3.8% (from 118,155 health cards to 113,664).

Regarding the frequency of ED use, there was an increase of 29% in the period studied, representing an annual growth rate of 2.9%, although in the last year 2006-2007 the increase was 9.5% (Figure 1).

As for the parameter ED pressure, during the period studied, the total number of hospital admissions increased from 8,719 in 1998 to 9,475 in 2007, of which 6,168 in 1998 and 5,850 in 2007 were ED-referred. Therefore, the rate of ED pressure fell from 70% to 61% (Figure 2).

Finally, the evolution of ED-referred admissions was from 18% in 1998 with 81% discharged from ED to 14% in 2007 with 86% discharged from ED (Figure 2).

Comparing our results with the whole Extremadura community, in 1998 there were 375,223 emergency visits for a total of 1,069,419

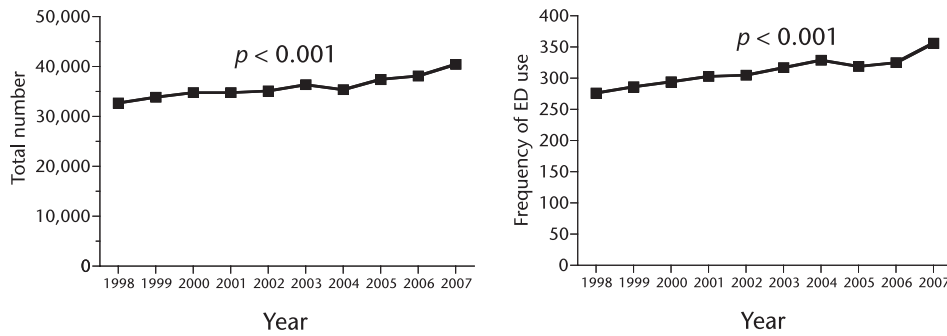


Figure 1. Evolution of the total number of ED visits (left) and frequency rates of ED use (right) at Hospital Virgen del Puerto.

inhabitants, while in 2006 there were 527,644 visits for 1,097,744 inhabitants, an increase of 4.5% per annum which does not correspond to a population growth of 2.6%^{14,15}.

For the whole country, emergency visits rose from 17,874,203 to 25,300,444 which corresponds to an annual increase of 4.61%. Table 1 shows the increase in ED visits for all the nation's autonomous communities and the total for the country during the period studied.

Hospital attendance in Extremadura increased by 4.12% annually, with a final figure of 480 ED visits/1000 inhabitants in 2006, while the national

figure increased by 2.2% per annum and in 2006 was 559 ED visits/1000 inhabitants. The Spanish population has increased by 1.3% per year, according to data provided by the National Institute of Statistics^{14,15}, although it assumes the bias of not knowing the number of uncensored immigrants.

In summary, Hospital Virgen del Puerto de Plasencia has seen an increase in hospital attendance of 2.9% per year, somewhat lower than the 4.1% for the whole community and more similar to the increase of 2.1% calculated for the whole Spanish population (Figure 3).

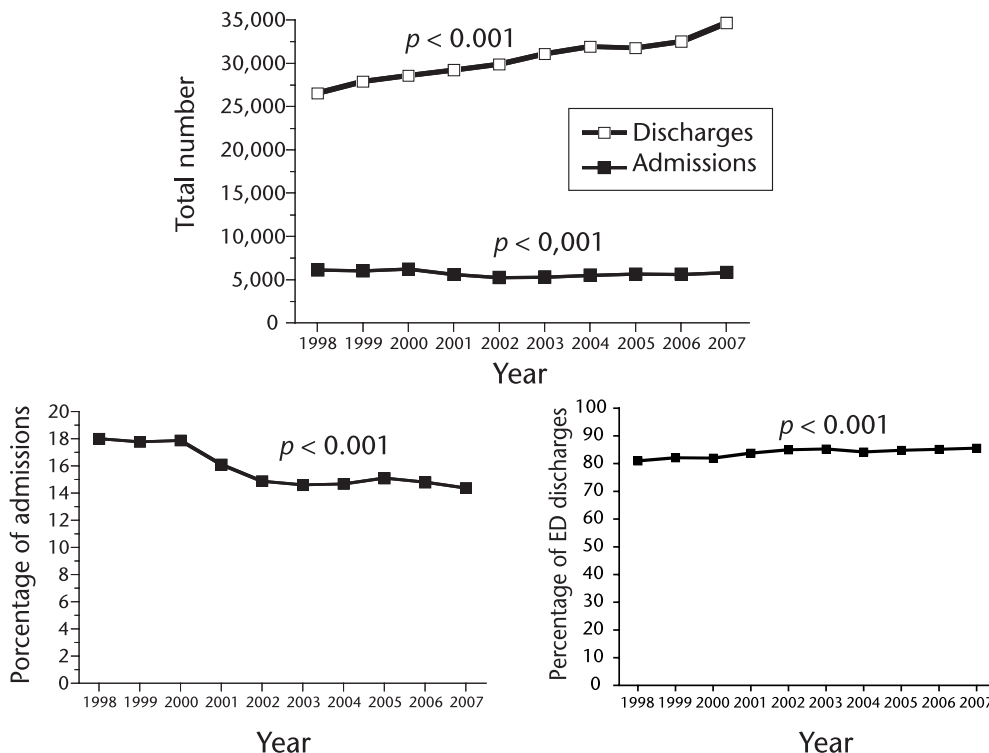


Figure 2. Evolution of the final destination of the patients visiting the emergency department of Hospital Virgen del Puerto.

Table 1. Total numbers of visits to emergency departments according to Autonomous Community and year¹⁴.

	1998	1999	2000	2001	2002	2003	2004	2005	2006
Andalusia	3,530,466	3,623,342	3,845,218	4,051,008	4,170,241	4,379,346	4,525,044	4,731,287	4,974,758
Aragon	511,213	533,974	560,336	583,391	620,307	643,709	646,766	665,971	693,663
Asturias	373,027	385,360	411,425	424,201	438,796	467,850	459,220	468,914	487,775
Balearic	511,066	534,722	580,253	919,019	686,103	692,225	720,777	732,548	770,634
Canary	656,757	732,294	725,283	778,129	797,578	830,229	842,899	913,640	923,605
Cantabria	262,501	268,681	271,314	291,518	297,624	337,382	346,111	359,567	368,517
Castilla y Leon	885,808	905,362	925,708	959,931	976,449	1,035,342	1,029,992	1,039,634	1,071,094
Castilla-La Mancha	628,699	648,995	677,642	717,721	754,164	790,807	824,619	836,572	866,955
Catalonia	3,709,292	3,850,227	3,991,864	4,131,544	4,412,663	4,379,732	4,409,308	4,432,839	4,612,909
Valencia	1,826,383	2,002,344	2,069,212	2,178,516	2,364,176	2,464,752	2,473,433	2,589,567	2,620,419
Extremadura	375,223	388,784	419,029	4,305,368	462,044	491,280	492,869	503,022	527,644
Galicia	989,729	1,052,721	1,057,093	1,111,074	1,135,728	1,260,048	1,267,987	1,319,142	1,366,837
Madrid	2,490,718	2,573,974	2,688,024	2,850,506	2,931,781	3,110,981	3,186,863	3,291,920	3,452,655
Murcia	601,683	659,232	693,856	770,480	822,324	855,665	871,002	929,100	933,232
Navarre	248,108	254,372	248,832	258,474	257,037	266,841	265,800	267,219	276,738
Basque Country	852,222	895,606	914,731	959,496	1,000,622	1,043,230	1,052,006	1,074,903	1,099,874
Rioja	104,436	112,968	114,585	113,653	117,077	121,108	124,019	125,927	136,437
Ceuta and Melilla	82,505	85,548	90,782	95,617	101,665	110,780	115,588	114,119	166,698
Total	18,639,836	19,508,536	20,285,187	21,324,816	22,346,379	23,281,307	23,654,303	24,395,891	25,300,444

Regarding ED pressure and the rate of admission compared to ED attendance, in Extremadura in 1998, 17% of all ED visits were admitted, with ED pressure of 62%, and in 2006 the figure decreased to 14% with ED pressure of 61%¹⁶.

In the whole Spanish State, there were 4,525,080 hospital admissions in 1998, of which 2,152,128 were ED-referred, with ED pressure of 47% and 12% of ED-referred admissions out of the total number of ED visits (17,874,203).

In 2006 there were 5,187,122 hospital admissions of which 2,821,885 were ED-referred (54% ED pressure and 11.1% ED-referred admissions with about 88.8% discharged from ED)¹⁴.

Figure 3, a summary, includes all the data for the Hospital Virgen del Puerto, Extremadura, and all Spain, showing the increase in emergency visits attended, hospital attendance and the decreased percentage of ED-referred admissions with respect to total ED visits, and the trend towards normalizing ED pressure over the 10-year study period.

Discussion

The World Health Organization (WHO) defines a medical emergency as "the fortuitous occurrence (unforeseen or unexpected) in any place or activity, of a health problem due to different causes and of varying severity, which generates the awareness of imminent need for attention on the part of the individual suffering the problem or his family." This definition implies the heterogeneity of the emergency (due to different causes and varying severity) and includes objective aspects, such as severity and acuity of the process (unfore-

seen or unexpected), and subjective aspects (awareness of the need for immediate attention), which generates in the user the expectation of prompt attention and resolution. On the one hand this indicates that not all emergencies are equal, and on the other hand that urgency and severity are not synonymous^{17,18}.

In short, the individual performs a self-diagnosis after the sense of loss of health, which is the determinant of demand, in conjunction with personal knowledge of the supply of health resources, and decides to go to the point where he/she believes will be most effective, without applying ethical or cost criteria^{19,20}.

Thus, it is obvious that the subjective evaluation of a given process as urgent is an inherent characteristic of the individual, assimilated over the last few years as a result of psycho-anthropological, economic, social development with various determinants, classified as predisposing (age, sex, race, education, working activity, family size), facilitating (individual income, availability and resource accessibility) and necessity (perception of health status and degree of activity limitation due to specific problems)²¹.

In the Hospital Virgen del Puerto the number of emergency visits attended in the last ten years has increased by 26%; this increase is not peculiar to our hospital, but has occurred in the wider community of Extremadura as in the rest of the country, with the frequency of hospital use increasing by 4% and 2% per annum respectively.

The determinants of the increase, according to different studies²²⁻²⁴, are related to supply and demand. The demand-related aspects are: a) prolonged life expectancy and consequent aging,

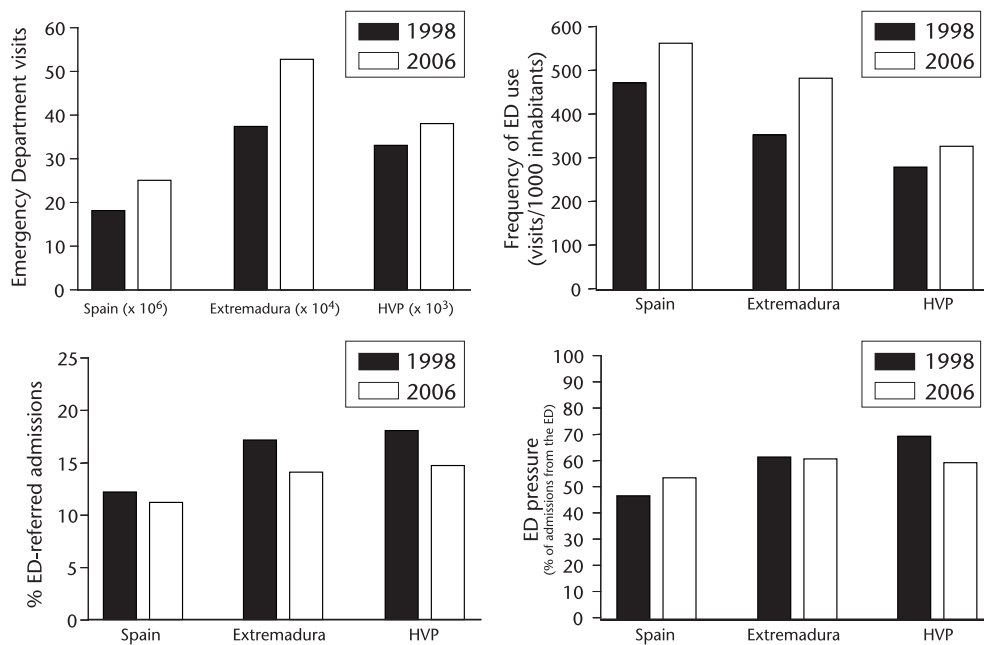


Figure 3. Comparison of the main indicators, for Spain, Extremadura and Plasencia¹⁴⁻¹⁶. H.V.P.: Hospital Virgen del Puerto.

with an increase in the population groups over 65 and 85 years where there is higher prevalence of disease, usually chronic, producing acute decompensation and requiring urgent attention; b) changes in patterns of morbidity and mortality, with new processes, where immediacy of attention is increasingly important, c) increase in accident victims due to traffic accidents, work activity, and all types of violence, d) lack of health education and immediate hospital-centred attention, without awareness of cost and with a high level of demand for more efficient and faster attention, and e) the population growth and social changes stemming from migratory movements in the last decade. The supply-related aspects are: greater accessibility to hospitals (inverse relationship between geographical distance and use of resources), lack of insurance, irregular development of primary care in general and especially its emergency services, and the incorrect use of the ED as an alternative source of outpatient care for non-urgent problems, to avoid waiting lists or get deferred programmed activities performed.

It is worrying that, besides the annual increase of 5% ED visits, this is partly due to inappropriate visits (non-urgent or manageable in primary care), estimated at 20-80% according to different studies^{7,8}. Most of the demand for urgent attention consists of banal, non-urgent processes. In theory, demand for health care is produced by health need but, in practice, is motivated by complex

subjective reasons, sometimes not health-related, and is influenced by the organization of the system, lack of knowledge and the fact that it is free²⁵⁻²⁷.

Our results show a decreased proportion of ED-referred admissions and a higher proportion of patients discharged home after ED assessment, as well as a trend towards normalization of ED pressure: the lower the percentage of ED-referred admissions, the greater the hospital's capacity for scheduled activity, essentially surgery. Previously, we defined the percentage of admissions as an indicator of quality which indirectly provides information on the severity of emergency cases. We believe that the decrease in ED-referred admissions during the ten year study period is largely due to the increased use of the ED for non-urgent health situations. This implies that: a) people who use the ED inadequately may be doing so instead of using primary care, with implications for the quality of care, such as loss of continuity, treatment monitoring and failure in preventive medicine and health promotion⁵, b) ED attention of inadequate cases can lead to delays in severe case attention and, sometimes, increased mortality, c) the disproportionate increase in ED demand has negative consequences for the whole hospital in the form of lack of physical space, work overload for the central services and for the hospital professionals, as well as increased waiting lists for scheduled admissions, and d) a non-urgent case

attention in the ED is associated with increased healthcare cost, with welfare losses for the society as a whole, which clearly affects the functioning^{4,5,22}.

Given all this, the growth in demand for ED attention is one of the most worrying health issues in all Western countries. The demand for emergency care has increased dramatically in recent years and in all the autonomous communities of Spain (Table 1), and meeting such a demand consumes a considerable amount of human and material resources, with consequent overload for limited ED services, which may mean deterioration in quality of service and social welfare social^{4,22}.

Emergency attention should therefore be considered as an expanding area that requires organizing the available resources²⁸. Thus, knowledge about the general demand for ED services is essential for planning public investment in structures and personnel and for the proper allocation of available resources. Adopting such measures requires knowledge of the actual demand for ED services.

In conclusion, this study shows that there has been an unfavourable evolution during the last ten years, with a progressive increase in ED demand, largely due to inadequate cases, a situation not only been observed in the hospital where the work was performed but also in the whole country.

References

- 1 Aracil E, Banegas JR, Bengoechea B. Sistema gráfico de información sanitaria en España. Madrid: ARTURSA; 1996.
- 2 Defensor del Pueblo. Informe sobre Urgencias Hospitalarias. Madrid: Oficina del Defensor del Pueblo; 1988.
- 3 Peiró S, Sempere Selva T, Oterino de la Fuente D. Efectividad de las intervenciones para reducir la utilización inapropiada de los servicios de urgencias hospitalarios. Revisando la literatura 10 años después del Informe del Defensor del Pueblo. Vitoria: Economía y salud; 1999. pp. 1-16.
- 4 Oterino D. Utilización inadecuada de un servicio de urgencias hospitalario. Una evaluación con criterios explícitos. Gac Sanitaria. 1999;5:361-70.
- 5 Benayas Pagán M, Aznar Lara JM, Montoya García M. Evolución de la frecuentación en el servicio de urgencias del hospital Torrecárdenas S.A.S. Almería. Años 1990-94. Emergencias. 1998;10:290-5.
- 6 Alonso Fernández M, Hernández Mejía R, Del Busto Prado F, Cueto Espinar A. Utilización de un servicio de urgencias hospitalario. Rev San Hig Pub. 1993;67:39-45.
- 7 Escobedo F, González L, Salarichs M, Manzano A, Martín JA, Albada-lejo C. Evaluación de las urgencias hospitalarias desde un área básica de salud. Aten Primaria. 1997;19:169-75.
- 8 Sempere MT, Peiró S, Sendra P. Utilización inadecuada de las urgencias hospitalarias. Identificación, causas y determinantes. XIX Jornadas de Economía de la Salud. 615-616.
- 9 Estadística de establecimientos sanitarios con régimen de internado, 2005. Instituto de Información Sanitaria. Madrid: Ministerio de Sanidad y Consumo; 2007.
- 10 Grupo de Trabajo SEMES. Calidad en los servicios de Urgencias. Indicadores de calidad. Emergencias. 2001;13:60-5.
- 11 Plan de Calidad para el Sistema Nacional de Salud. Desarrollo de indicadores para el análisis de la hospitalización en el sistema nacional de salud. Madrid: Ministerio de Sanidad y Consumo; 2008.
- 12 Dirección general de asistencia sanitaria Subdirección de Asistencia Especializada – Gestión Sanitaria. Plan andaluz de urgencias y emergencias. Plan funcional de la sección de urgencias del servicio de cuidados críticos y urgencias. Junta de Andalucía - 20-3-04.
- 13 Pacha E, Durán MA. Demandas urgentes de tiempo y asistencia sanitaria. Política y Sociedad. 1995;19:101-16.
- 14 Establecimientos sanitarios con régimen de internado. Instituto Nacional de Estadística 2008. (Consultado 10 Mayo 2009). Disponible en: <http://www.INE.es>.
- 15 Cifras de población y censos demográficos. Instituto Nacional de Estadística 2008. (Consultado 10 Mayo 2009). Disponible en: <http://www.INE.es>.
- 16 Estadística de Indicadores Hospitalarios. Instituto Nacional de Estadística 2008. (Consultado 10 Mayo 2009). Disponible en: <http://www.INE.es>.
- 17 Jiménez Murillo L, Hermoso Gadeo F, Tomás Vecina S, Algarra Paredes J, Parrilla Herranz P, Burillo Putze G. Equipo de Trabajo de SEMES-EASP. Urgencias Sanitarias en España: Situación Actual y propuestas de Mejora. Sociedad Española de Medicina de Urgencias y Emergencias. Granada: Escuela Andaluza de Salud Pública Editores; 2003.
- 18 Gómez Jiménez J. Urgencia, gravedad y complejidad: un constructo teórico de la urgencia basado en el triaje estructurado. Emergencias. 2006;18:156-64.
- 19 Pasarín MI, Fernández MJ, Calafell J. Razones para acudir a los servicios de urgencias hospitalarios. La población opina. Gac Sanitaria. 2006;20:91-9.
- 20 Castells X. Utilización de los servicios de urgencias hospitalarios. La importancia de la perspectiva de los usuarios. Gac Sanitaria. 2006;20:99-100.
- 21 Andersen RM, McCutcheon A, Aday LA, Chiu GY, Bell R. Exploring dimensions of access to medical care. Health Services Research. 1983;18:49-74.
- 22 Moreno Millán E. ¿Y si adaptáramos los servicios hospitalarios de urgencias a la demanda social y no a las necesidades de salud? Emergencias. 2008;20:276-84.
- 23 Sánchez López J, Bueno Cavanillas A. Factores asociados al uso inadecuado de un servicio de urgencias hospitalario. Emergencias. 2005;17:138-44.
- 24 Cano del Pozo MI, Rabanaque Hernández MJ, Feja Solana C, Martos Jiménez MC, Abad Díez JM, Celorrio Pascual JM. Estudio de la frecuentación de un servicio de urgencias extrahospitalario. Emergencias. 2008;20:179-86.
- 25 Sánchez López J, Bueno Cavanillas A. Factores asociados al uso inadecuado de un servicio de urgencias hospitalario. Emergencias. 2005;17:138-44.
- 26 Milla Santos J. Urgencias Médicas, algo más que una serie televisiva. Med Clin (Barc). 2001;117:295-6.
- 27 Tudela P, Modol JM. Urgencias Hospitalarias. Med Clin (Barc). 2003;120:711-6.
- 28 Martín Rodríguez G, Cáceres Hernández J. Un método de obtención del patrón estacional de frecuentación de un servicio de urgencias hospitalario. Rev Esp Salud Pública. 2005;79:5-15.

Evolución de la frecuentación en un servicio de urgencias hospitalario

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Objetivos: Describir la evolución de la frecuentación del servicio de urgencias hospitalario (SUH) en 10 años (1998-2007), en el Hospital Virgen del Puerto de Plasencia (Cáceres), de la proporción de ingresos respecto al total de urgencias atendidas y de la presión de urgencias.

Método: Estudio descriptivo, observacional y retrospectivo, se utilizó las bases de datos del Servicio de Admisión, para obtener el número de urgencias atendidas cada año, los ingresos totales y los realizados desde el SUH. También hemos obtenido del Instituto Nacional de Estadística los mismos datos por comunidades y los globales del país.

Resultados: La frecuentación del SUH en el Hospital Virgen del Puerto de Plasencia ha aumentado un 28,9% en todo el periodo estudiado (incremento anual del 2,8%) y no se correlaciona con el aumento poblacional, que ha sido del -3,8% en el mismo periodo. En cambio, ha disminuido la proporción de ingresos respecto a las urgencias atendidas un 4%, así como la presión de urgencias en un 9%. Este comportamiento ha sido similar al observado en Extremadura y el resto de España.

Conclusiones: En 10 años la frecuentación hospitalaria ha aumentado pero ha disminuido la proporción de ingresos realizados desde Urgencias, tanto en el Hospital Virgen del Puerto como en el resto de España. [Emergencias 2009;21:339-345]

Palabras clave: Frecuentación urgencias. Presión urgencias. Masificación Servicios urgencias.