

An approach to the economic impact of the treatment of pressure ulcers in Spain

By

J. Javier Soldevilla Agreda

Nurse. Infectious Diseases and Preventive Medicine Clinical Management Area. Riojan Health Service Professor of Geriatric Nursing. U. School of Nursing of Logroño. Director of GNEAUPP

Joan-Enric Torra i Bou

Nurse. Clinical Manager. Wound Healing. Smith & Nephew. Spain. Former Deputy Director GNEAUPP.

John Posnett

Professor of Economics of Health. University York. Head of Health Economics and Outcomes Research. Wound Healing Division. Smith & Nephew. United Kingdom.

José Verdú Soriano

Nurse. Doctor. Permanent Professor U School of Community Nursing, Preventive Medicine and Public Health and History of Science. University of Alicante. Member Board of Directors GNEAUPP.

Lorena San Miguel

Economist. International Reimbursement Specialist. Wound Healing Division. Smith & Nephew. United Kingdom.

José M. Mayan Santos

Professor of Geriatric Nursing. University of Santiago de Compostela

Correspondence:

J. Javier Soldevilla Agreda

Pza. Tomás y Valiente 4, bajo

26004-Logroño (La Rioja)

E-mail: jsoldevilla@arrakis.es

SUMMARY

Pressure ulcers are an important health problem in all health care⁴⁴ scenes and has a great impact on the patients and the resources of the Health and Socio-sanitary Systems.

The objective of this study is to estimate the cost of the overall treatment of pressure ulcers in Spain using to that effect information coming from different sources of primary data.

This study shows that the cost of treatment of a pressure ulcer rises substantially in proportion with the severity of the ulcer, starting at 24 €([\$ 32.16], Grade I) to 6.802 €([\$ 9.115], Grade IV) for patients treated in hospitals. The severity of the ulcer increases the global cost because the healing time is more prolonged and the incidence of complications is higher in the more severe cases.

The total treatment cost of pressure ulcers in Spain in a year is approximately 461 million euro ([\$ 618 million], nearly 5% of annual health costs). From this amount, 15% constitute the cost of dressings and other materials, while 19% covers the cost of nurses' time, and 45% of the total goes to extra stays in the hospital related to these lesions.

KEYWORDS

Cost, pressure ulcers, Spain.

INTRODUCTION

Nowadays nobody disputes that pressure ulcers (UPP) constitute an important problem for the Healthcare System; and their care, an important economic burden. The quantification of the approximate cost of care of UPP can contribute very useful information for:

- Sizing the problem.
- Establishing the variables that constitute their cost.
- Quantifying and analysing the impact of interventions, both preventive and treatment.

Being a health problem that is perceived as important (1,2), paradoxically there are a few papers in the literature that allow the overall dimensioning of the economic impact of UPP, and some of the published ones are based on general assumptions (3). Approximations in our country, as the case of the Autonomous Community of La Rioja (4), place the cost around seventy million old pesetas (some 421.000 €) according to data of year 1999. Perhaps the most precise cost study²⁰² associated with UPP to this date is the one carried out by Bennet, Dealey and Posnett in 2002 in the United Kingdom (5), where it was established that the cost of treating an UPP fluctuated from around 1.064 sterling pounds for stage I up to 10.551 for stage IV, indicating that the cost increases with the stage because the cicatrization time and incidence of complications also increase. In that study a total cost for the United Kingdom was estimated between 1,4 and 2,1 million pound sterling per year (which represented 4% of the English Health Care Service budget). Based on this same study, Posnett and Torra (6) extrapolated the data in 2003 to the Spanish reality, establishing a cost per episode of 211 € for stage I and

16.600 € for stage IV. The overall annual cost for our system was estimated then in 1.687 million € which constitutes 5,2% of the total healthcare expense of our country. Facing these distinct assessments, there is a clear need to obtain more precise economic data centred on the reality of our country that allow an irrefragable approximation to the impact of the UPP problem in Spain.

Coherent with the line of research initiated in 1999 (4), within the National Group for the Study and Counselling on Pressure Ulcers and Chronic Wounds (GNE-AUPP) the need was expressed for a study that would allow the quantification of the different variables involved in the cost of these lesions, with data as close as possible to the reality of our country in relation to:

- The costs in three different scenarios: patients treated in primary health care, patients treated in hospitals and patients treated in socio-sanitary centres.
- The total and itemised costs according to the following variables: nursing time, added hospital stays for hospitals and socio-sanitary centres, and materials.

GEROKOMOS 2007; 18 (4): 201-210

MATERIALS AND METHOD

For the calculation of cost indicators a triangulation is made with the ²⁰³ information coming from three primary data sources, as follows:

a) The data relative to the number of UPP treated at the three healthcare levels.

These data come from the 2nd. National UPP Prevalence Study made carried out in 2005 by the GNE-AUPP with the support of the Wound Healing Division of Smith & Nephew (7); from the said study information has been obtained relative to the prevalence of UPP, typology of lesions according to the stage, age of the lesion, its surface and the place where it had originated, in primary care as well as hospital and socio-sanitary care.

b) The information related to the estimated time of cicatrisation according to the stage of the ulcers.

Data coming from the analysis of the questionnaires filled out by a panel of experts from whom information was requested related to the treatment of UPP. Information bearing on the estimated time for cicatrisation of the lesions according to surface, stage and care level; time to perform the treatments; estimates of the occurrences of local and general infections; assessment of the increase of hospitalisation stays in hospitals and socio-sanitary centres, and percentage of lesions attended inside and outside of each healthcare level.

The panel of experts was defined as the attendees to the 2nd. National Meeting of Pressure Ulcer Committees organised by the GNE-AUPP in Arnedillo (La Rioja) on the 16th. and 17th. of November 2005. They expressed their conformity with the completion of a questionnaire with variables related to UPP treatment. A total of 77 correctly completed questionnaires were obtained, 20 (about 26%) from primary care professionals (APS), 51 (about 66,2%) from hospital professionals and 6 (about 7,8%) from socio-sanitary centre professionals. In the

case of professionals within the scope of APS their mean professional experience was 22,1 (5,3 DE) years, in the case of hospital professionals it was 17,2 (8 DE) years and in the case of socio-sanitary care it was 15,6 (9,8 DE) years.

Information was requested from the panel of experts, for care levels relative to the time needed for cicatrization, the number of cures and time for each cure according to three possible measures of UPP “type” of stages I, II, III and IV.

The panel was also requested information relative to the time percentage (evolution) of the different stages of UPP attended at each care level; the percentage of UPP that get infected and require local antimicrobial treatment; the percentage of UPP that get infected and require systemic antimicrobial treatment; the percentage of UPP in which the physician intervenes in its treatment; increase of stay in the UPP attended in hospitals and socio-sanitary centres, and the percentage of cures done by the families/caretakers in case of UPP attended in primary care.

c) The quantification of the cost of the different elements ⁴⁵ that make up the total treatment cost of the UPP.

This was done in two consecutive phases. In the first phase were established the necessary materials for the performance of a “type” cure for the treatment at the three care levels of UPP of different stages and surfaces.

In a second phase costs were assigned to human resources as well as to materials and institutional resources, on the basis of different information sources at the national and regional levels, taking as reference the Autonomous Community of La Rioja, single-province and least populated in the entire country (Table 1).

Table 1. Cost calculation for healthcare personnel involved in the treatment of UPP	
Annual salary of a specialist in the area (Physician) (1)	- Physician: 38.844,57 €/year - Salary + employers' quota: 38.844,57 + 12.527,37: 51.371,9 € - Cost per hour over a mean of 1.500 hours/year: 34,2 € - Cost per minute: 0,57 €
Nurses APS (1)	- Nurse: 22.442,93 €/year - Salary + employers' quota: 22.442,93 + 7.237,8: 29.680 € - Cost per hour over a mean of 1.500 hours/year: 19,8 €
Nurse Hospital and socio-sanitary (1 and 2)	- Cost per minute nurse APS or socio-sanitary: 0,33 € - Cost per minute personnel nursing hospital: 0,33 of nurse + 0,057 of auxiliary (see cell below): 0,387 €
Auxiliary Nurse (Hospital)	- Auxiliaries: 15.586 €/year - Salary + employers' quota: 15.586 + 5.026: 20.612 € - Cost per hour over a mean of 1.500 hours/year: 13,7 € - Cost per minute: 0,23 € 25% of the cost per minute: 0,057 €

(1): According to our own data developed from table “Comparative salaries FEA and Nurses in the National Health System Newsletter CCOO Málaga” posted in <http://www.funcionadministrativa.com> (consulted el 11.04.06). Gross salary + employers’ quota (32,25%).

(2): It is calculated that in 25% of the cases, a Nurse Auxiliary is required (in Hospital and socio-sanitary) (for positioning...). Therefore, 25% of the cost of one minute of auxiliary is added.

204

Table 2. Costs related to infection as a UPP complication	
Cost per local infection in Hospital-APS-SS	- 1 culture + local antimicrobials for 10 days + Five minutes physician + one blood and urine analysis. - Cost bacteriological analysis by smear with swab: 9,02 €(includes material + bacteriological analysis). - For cost calculation of the local treatment of the infection in a hospital for ten days we take the mean between 5 silver dressings (10 x 10 cm) (a) and 10 applications of 5 g of silver sulfadiazine (SDA) (b). - 5 minutes of physician at 0,57 € 2,85 € - Basic general analysis (blood and urine): 8,96 € Total cost of episode: 9,02 + 13,6 + 2,85 + 8,96: 34,43 €
Cost per infection with systemic treatment in hospital	- 2 cultures + systemic antibiotic parenteral (10 days) (c,f) (+ 1 blood analysis (hospital) + 10 min physician. Total cost of episode: (2 x 9,02) + 132,2 + 8,96 + 5,7: 164,90 €
Cost per infection with systemic treatment in APS-SS:	- 1 culture + systemic antibiotic orally (15 days) (d, e, f) + 1 blood analysis + 10 min physician. Total cost of episode: 9,02 + 21,75 + 8,96 + 5,7: 45,43 €

Methodology for calculating the treatment cost

The treatment costs have been estimated according to the stage of the UPP and the care level, including the following components:

- Cost of replacement of dressing.
- Cost of the infection episodes.
- ⁴⁶ Cost of extra stays in hospitals or socio-sanitary centres.

Cost of replacement of dressings

The calculation has been made including the nursing time and the cost of the dressings and of the materials of

treatment on the basis of the formula:

Cost per day = daily frequency of dressing change x (cost of nursing time per change + cost of dressings and treatment material per change).

For patients treated in Primary Care, the cost of dressing changes also include the estimated travel time.

Cost of infection episodes

The estimated cost of infection per patient has been calculated on basis of the following formula:

Probability of an infection (superficial or systemic) x cost of infection episode, per episode.

The cost of superficial or systemic infection episodes has been calculated taking into account the analytic determinations (cultures) as well as the local and systemic antimicrobial therapies in accordance with the variables described in Table 2.

General type assumptions related to the infection

It is assumed that the local infection carries an associated systemic treatment (habitual practice, though not desirable) (in the case of hospital, parenterally, and in the case of APS-Socio-sanitary, orally).

- It is assumed that the systemic infection carries an associated local antimicrobial treatment.
- A physician devoted to the UPP patient 5 minutes in case of infection with local treatment and 10 minutes in case of infection with systemic treatment.

a) Mean of 5 antimicrobial dressings (10 x 10 cm): 5,18 €unit

(Biatain Ag®: 5,3 € Comfeel Ag®:

5,11 € Aquacel Ag® (10 x 13):

6,92 € Calgitrol Ag®: 4,77 € Acti-

sorb Plus® (10,5 x 10,5): 3,83 €).

b) Silver Sulfadiazine 5 g:

0,13 € Dressings replaced every two days + Ag sulfadiazine Ag applied daily.

c) Mean cost of antibiotic parenteral therapy and more commonly used dosages in the treatment of chronic wound infections in the hospital: (13,22 x 10 days: 132,2 €) (10-day treatment).

- Amoxicillin-Clavulanate 1-2/ 0,2 g c/6 h iv –day– 3,96 €
- Amikacin 15 mg/kg/day iv –day– 2,60 €
- Ceftazidime 2 g c/8 h iv –day– 23,10 €
- Cefepime 2 g c/12 h iv –day– 29,16 €
- Cefotaxime 1 g c/8 h –day– 2,31 €
- Cloxacillin 1 g c/4 h. –day– 3,84 €
- Ceftriaxone 1 g/day iv –day– 0,80 €

- Clindamycin 600 mg c/6 h –day– 3,56 €
- Imipenem 1 g c/6 h iv –day– 44 €
- Metronidazole 500 mg c/ 8 h iv –day– 2,55 €
- Piperacilin-tazobactam 4-0,5 g c/6-8 h. –day– 39 €
- Tobramycin c/8 h –day– 3,78 €

d) Oral antibiotic therapy and dosage more commonly used in the treatment of infection from chronic wounds in primary and/or socio-sanitary care for 15 days.

- Amoxicillin-Clavulanate 500/125 c/8 h oral –day– 0,51 €
- Ciprofloxacin 750 mg c/12 h oral –day– 0,26 €
- Clindamycin 300 mg c/8 h. Oral –day– 0,63 €
- Levofloxacin 500 mg c/24 h. Oral (7 days) –day– 2,77 €(7 days)

e) Mean of the use of oral systemic antibiotics in APS-SS: (1,45 x 15 days: 21,75 €) (the cost has increased 40% over hospital figures when habitually processed by recipe).

Source: Mensa J, et al. Skin infections, subcutaneous tissue and fascia. In: Guide to antimicrobial therapeutics. 15th. edit. pp. 355-9. Masson. Barcelona, 2005.

Cost of extra stay in hospital or socio-sanitary centre.

For the majority of patients it has been assumed that the motive for admission was not their UPP treatments.

Costs have been included only when:

- For patients treated in hospitals or socio-sanitary centres their stay was prolonged due to the ulcer(s) ²⁰⁵.
- A part of the ulcer(s) treatment episode is attended at another care level (e.g., primary care patient is admitted to the hospital to treat a UPP).

Table 3 shows the information relative to the daily costs of hospital or socio-sanitary care beds.

RESULTS

According to the methodology described in the previous section, the individual cost of a UPP treatment according to the care level and type of treatment, without taking into account possible complications like infections and the extension of hospital stay, would remain fixed at the quantities presented in Tables 4, 5 and 6.

Considering the number of patients with UPP in Spain extracted from the latest prevalence study (7), an estimate was established of the total number of patients treated in a week per care level and stage of the ulcers (Table 7).

In that study information was obtained from 1,86% of the population older than 14 in Spain on January 1st. 2005 (8), from 6,61% of acute care hospitalisation beds in Spain (according to statistics of sanitary facilities with inpatient regimens updated to 31-12-2003 (9)), and of 4,05% of the 265.712 socio-sanitary type beds (according to data from 2004 published in the white paper: “Care for persons in state of Dependence in Spain” of the Ministry of Labour and Social Matters (10)).

The health care level is the environment in which the majority of the care of an ulcer is given. The patients can move among the different care levels during a treatment episode.

The extrapolation of data from the cited prevalence study (7) to Spain’s entire population’s reality allows us to assert that at any moment some 53.000 UPP patients are treated, according to census information and official healthcare institution statistics (8-10).

47

Table 3. Costs of stays in hospitals or socio-sanitary centres	
Daily cost of hospital bed (1) Daily cost of socio-sanitary bed (2)	350 €/per day 52,37 €/per day
(1): Data from CCAA of La Rioja. In an Internal Medicine Unit of the San Millán Hospital Complex -San Pedro de la Rioja (Consultation to the Administration Service in April 2006). (2): Cost of socio-sanitary bed /Assisted Residence (public prices 2006 for space booked in private centres of the CC AA of la Rioja (Official La Rioja Bulletin).	

Table 4. Pressure Ulcer Stage II. Estimated cost until cicatrisation: labour + materials			
	Primary Care (*)	Hospital (**)	Socio-sanitary care
Up to 4 x 4 cm	91,4% UPP	85,2% UPP	88,8% UPP
Cure humid environment	103 €	36,2 €	92,71 €
Traditional cure	254,9 €	58 €	178,9 €
From (4x4 to 8x8)	4,7% UPP	7% UPP	5,5% UPP
Cure humid environment	191,4 €	66,3 €	493,6 €
Traditional cure	477,9 €	134,5 €	630,8 €
More than 8 x 8 cm	3,9% UPP	7,9% UPP	5,8% UPP
Cure humid environment	333,8 €	130,8 €	684,3 €
Traditional cure	659,7 €	207,6 €	857,12 €
(*): includes travel. (**): includes auxiliary time.			

Table 5. Pressure Ulcer stage III. Estimated time until cicatrisation: labour + materials			
	Primary Care (*)	Hospital (**)	Socio-sanitary care
Up to 4 x 4 cm	65,2% UPP	58,1% UPP	74,1% UPP
Cure humid environment	306,6 €	164,6 €	402,7 €
Traditional cure	591,9 €	256,3 €	623,1 €
From (4x4 to 8x8)	17% UPP	22,4% UPP	15,9% UPP
Cure humid environment	422,6 €	342,2 €	530,8 €
Traditional cure	1.028,5 €	549,3 €	840 €
More than 8 x 8 cm	17,8% UPP	19,5% UPP	10% UPP
Cure humid environment	766,2 €	601,8 €	926,3 €
Traditional cure	1.425,1 €	769,2 €	1.181 €
(*): includes travel. (**): includes auxiliary time.			

In accordance with the stage of these lesions, about 21% are stage I, 36,5% stage II, 29,6% stage III and 12,9 stage IV. 49,8% of the same are treated in primary care, 19,8% in hospitals and 30,4% in socio-sanitary centres.

48

Table 6. Pressure Ulcer stage IV. Estimated cost until cicatrisation: labour + materials			
	Primary Care (*)	Hospital (**)	Socio-sanitary care
Up to 4 x 4 cm	43,4% UPP	32,6% UPP	51,4% UPP
Cure humid environment	865,6 €	532,6 €	650,6 €
Traditional cure	1.283,1 €	760,3 €	996 €
From (4x4 to 8x8)	17% UPP	16,9% UPP	15,2% UPP
Cure humid environment	1.256,2 €	832,4 €	1.238 €
Traditional cure	1.572,4 €	1.149,9 €	1.903 €
More than 8 x 8 cm	39,6% UPP	50,6% UPP	33,3% UPP
Cure humid environment	1.973,8 €	1.753,9 €	1.758 €
Traditional cure	2.291,7 €	1.833,6 €	2.232 €
(*): includes travel. (**): includes auxiliary time.			

The GNE-AUPP prevalence study (7) allows to view as an average the number of UPP per patient, fixed at 1,6, for which these 53.000 patients would show, approximately, a total of 85.000 lesions.

The weekly cost per patient (Table 8) is calculated on the basis of the previously described parameters and results from the division of total cost per episode by the mean duration of episodes (in weeks). The episode duration is the time expected for the cicatrisation of an ulcer (according to stage and level), calculated for its analysis using the median of evolutions in accordance with the second national UPP prevalence study (7). The cost per episode has been calculated by weighing the costs of the different possible dimensions in accordance with the frequencies of different types of surfaces that can be extracted from the UPP data base of the already mentioned prevalence study.

In whatever way the lesion evolution time is, necessarily less than the cicatrisation time, we find ourselves before a downward estimation of the cost per episode. The cost per patient²⁰⁶ takes into account the fact that a patient may have more than one lesion.

In this sense it is interesting to point out that:

- The weekly costs increase with the stage of the lesion at all care levels.
- For stage I lesions, the weekly costs are more expensive in primary care due to the additional cost of travel for professionals (its estimated mean is 20 minutes).
- The relatively high cost of a stage II UPP in socio-sanitary centres is due to the significant proportion of patients (7,5%) in this care level who are transferred to a hospital during a part of their episodes.

The annual cost comes from the combination of prevalence of the lesion and the mean of lesions per patient with the weekly cost per patient, assuming the prevalence is stable during the entire year.

Table 9 shows an estimate of the national annual cost of treatment of the UPP in Spain by care levels.

Stage of the UPP	Primary care	Hospital	Socio-sanitary centres	Total
	From a total of 37.880.215 inhabitants older than 14 in Spain 1-I-2005	From a total of 128.082 acute care hospital beds in Spain (according to statistics of sanitary facilities with inpatient regimens updated to 31-12-2003)	From a total of 265.712 socio-sanitary type beds (according to statistics of year 2004 published in the book: "Attention to persons in a state of dependence in Spain" of the Ministry of Labour and Social Matters)	
I	5.116 (19,3%)	3.216 (30,5%)	2.885 (17,8%)	11.217
II	8.987 (33,9%)	4.133 (39,2%)	6.321 (39%)	19.441
III	8.722 (32,9%)	2.246 (21,3%)	4.781 (29,5%)	15.749

IV	3.711 (14%)	959 (9,1%)	2.221 (13,7%)	6.891
All stages	26.536	10.554	16.208	
53,261	(49,8%)	(19,8%)	(30,4%)	
*Level at which the majority of treatments are made. The patients might be cared for in other care levels during the course of an episode.				

207

Table 8. Weekly treatment cost (assuming the best practice with cure dressings in humid environment) by care level *			
Stage of UPP	Primary care (million euro)	Hospital (**)	Socio-sanitary care
I (**)	27 €	17 €	13 €
II	51 €	73 €	309 €
III	76 €	539 €	353 €
IV	201 €	794 €	384 €
(*): level where the majority of treatments are given. (**): stage I UPP treated with hyper-oxygenated fatty acid products.			

Table 9. National cost of UPP treatment in Spain by care level *			
Stage of lesions	Primary care (millions euro)	Hospital (**)	Socio-sanitary care
I	7,18	2,8	1,98
II	23,97	15,75	101,62
III	34,68	62,90	87,87
IV	38,74	39,59	44,32
All	104,57	121,04	235,79
461 millions of	(22,7%)	(26,2%)	(51,1%)
*Sector where majority of assistances have been given.			

The total national cost of UPP treatment in a year can be itemised on the basis of its main components: nursing time, materials and extra stay cost in hospitals or socio-sanitary centres (Table 10).

As a summary of the UPP treatment cost in Spain, and within the scope of individual episodes, Table 11 shows the mean values corresponding to the treatment of a UPP according to its stage and care level taking into account the possible complications (infection and extra stay); Table 12 itemises the different variables of the mean cost of an UPP episode.

Humid environment cure versus cure with traditional dressings

The information contained in Tables 9, 10 and 11 has been obtained assuming all patients were treated with humid environment cure dressings. Anyway, it is possible to compare the expected costs as they correspond to humid environment cure dressings or to traditional dressings.

The total estimated annual cost of UPP treatment in Spain would be 602 million euro if they were all treated with traditional dressings, as opposed to a cost of 461 million euro if they were treated with cure dressings in humid environment, i.e. 131 million or 31% more.

Although the humid environment cure dressings are more expensive, their technological advantages allow having a smaller number of changes and their use a decrease in the cicatrisation times, with the consequent significant decrease in overall costs (11).

Table 13 shows the differences in cost by episode and stage of the ulcer. In this sense it must be pointed out that there exist differences between the costs per dressing and cure, in the frequency of change of dressings, and in the expected cicatrisation time that has been estimated higher by 25% for the traditional cure group. The costs per episode for each stage have been weighted among the three care levels.

According to these data, the use of traditional cure dressings represents a cost increase per patient of between 21 and 41%.

It is also possible to separately calculate the costs by type of resource, material costs (dressings and antibiotics), nursing time, extra stay days in hospital and socio-sanitary centre (the extra days include only the extra stay related to the ulcer). This information is summarized in Tables 14 and 15.

Table 10. National treatment costs by type of component					
Stage of the lesionss	Total cost (millions euro)	Materials	Nursing time	hospital extra stay	socio-sanitary extra stay
I	11,96	7%	93%	-	-
II	141,34	12%	14%	48%	26%

III	185,45	15%	19%	44%	22%
IV	122,66	16%	20%	45%	19%
All	461 mill €	67,4 mill €	88,6 mill €	205,8 mill €	99,7 mill €
		14,6%	19,2%	44,6%	21,6%

50

Table 11. Mean cost of treatment for a UPP by patient and by principal care level			
	APS	Hospital	Socio-sanitary
Stage I	108 €	24 €	43 €
Stage II	220 €	136 €	1.767 €
Stage III	655 €	2.309 €	3.282 €
Stage IV	2.868 €	6.802 €	4.935 €

Table 12. Mean use of resources based on a mean UPP episode				
	Dressings	Nursing time	Extra stay hospital	Extra stay socio-sanitary
	Euros	Hours	Days	Days
Stage I	5	3,1	0,0	0,0
Stage II	83	4,8	4,5	0,6
Stage III	246	16,3	9,3	1,6
Stage IV	661	40,3	17,0	6,3
All	189 €	12,4	6,6	1,5

Table 13. comparison of mean cost per patient depending on use of humid environment cure dressings or traditional dressings				
Stage of UPP	Humid environment cure dressings	Traditional dressings	Difference	
	(Total episode cost)	(Total episode cost)	Cost	Percentage

I	67 €	84 €	17 €	25%
II	705 €	992 €	287 €	41%
III	1.688 €	2.290 €	602 €	36%
IV	4.082 €	4.939 €	857 €	21%
All	1.298 €	1.695 €	397 €	31%

DISCUSSION

As can be seen, the cost of treating the UPP in Spain entails an important outlay for the sanitary system and the society at large, approaching figures that exceed 5% of our country's annual sanitary expenditure (6). We point out, in addition, that the data presented here are understood as a downward estimate due to the limitations commented in relation to data coming from the prevalence study and the cost calculation study (information given by a panel of experts) that has served as the basis for our work.

In relation to the cost of UPP treatment in Spain it is important to point out that:

- Costs are presented according to the principal care level. But patients could circulate among the different care levels during a treatment episode.
- According to Table 7, the majority (50%) of the patients are treated, mainly, in the APS while they represent only a 23% of the total cost (Table 9). Likewise, 20% of them are being treated in the hospital with 26,6% of the total (without ignoring that the extra stays at this level assume a 44,6% of the total), and lastly, while in the socio-sanitary care 30% of UPP patients are cared for, this level represents 51% of the total cost.
- The cost of materials employed in UPP treatment (dressings, other cure materials and antibiotics) represent a minority (14,6%) of the total cost, 67,4 million euro out of a total cost of 461 million.
- The mean cost of nursing time used in the UPP treatment represents 19,2% of their total cost; in spite of the great amount of nursing time consumed, the total cost of their care is very directly conditioned by those patients whose stay, in hospitals as well as in socio-sanitary centres, is prolonged in time. This increase of stays represent 66% of the total cost. In APS they are also increased by the time of travel of the professionals to the patient's home.
- By the severity of the lesion we can point out that costs are higher for a stage II UPP in socio-sanitary care because many of these patients are interned in the hospital during a part of their care, the same thing happening for stage III, but keeping in mind that the cicatrisation time is longer. Many patients with UPP stage IV are attended in the hospital at least during a part of their treatment due to the gravity of the lesion and the probability that it develops complications.

In relation with the cost with traditional cure and humid environment cure we can emphasise that:

- According to the mean of all ulcers, the expense in materials is lower per patient in the case of humid environment dressings (191 as opposed to 189 euro) in spite of the fact that unit costs of humid environment cure dressings are more expensive (except in the case of stage IV ulcers).

– The main impact of the change from traditional cure to humid environment cure is centred in the nursing time; this is due to a lower need for dressings changes and to a shorter cicatrisation time. For instance, the cicatrisation of an ulcer with humid environment dressings require a mean of 13.6 nursing hours less than when it is cured with traditional cure dressings.

Historically, due to peculiarities surrounding this type of lesions, the UPP have not been considered an important public healthcare problem, but in economic terms, if we make a relative comparison with health problems which, at first sight, become much more important for the sanitary system and society at large, e.g. AIDS or diabetes type II, we will have a clearer idea of the dimension reached by the UPP:

– According to infection indicators for HIV and AIDS in Spain, published in 2006 (12), the annual expenditure for the treatment with antiretroviral increased to about 422 million euro in 2004, while in our case, the least expensive option related to the treatment of UPP (cure in humid environment) places us at an expense of 461 million euro, or the most expensive (traditional cure) in 602 million.

– The annual cost per patient treated for diabetes type II assumes, according to 2001 data, 1.305,15 euro (its annual cost would be about 326.000 million old pesetas, which means 4,4 % of the total Spanish sanitary expenditure) 13,14 compared to an average clip, in the case of UPP treatment, between 1.298 and 1.695 euro, according to the type of treatment (humid environment or traditional cure).

Besides, several publications have said that these lesions present an important associated morbidity and mortality, worsen the quality of life of the patients and caretakers and, as it has become clear, represent an important outlay for the sanitary system in human resources as well as materials, which results in a not insignificant economic impact.

Specifically, Allman (3) indicates that the hospital stay increases up to 5 times when the patients develop an UPP, with a mean hospital cost near twice the normal situation; that many people with UPP experiences pain, although only a third of those who suffer from it can express it because of their state; that the systemic infection is a frequent complication associated to the UPP and that to be a carrier of a UPP increases the chance of dying (3, 15-18). The presence of a UPP has been associated with a risk of death of 2 to 4 times higher than in the absence of this type of lesions in patients of advanced age (16) and in intensive care patients (17). It is estimated that in Spain for every 100.000 deaths produced, more than 165 are due to or related to the presence of UPP (19).

Pam Hibbs (19), in the eighties, was correct in characterising the problem of pressure ulcers as an “Epidemic under the sheets”, illustrating in a very didactic way the epidemiologic dimension of these sad health-loss processes and accepting a double metaphor relating the territory of our body that is commonly affected, and at the same time, the condition of secretiveness, lack of knowledge and, sheltered in that more intimate-domestic level, inherently, the devaluation of the problem.

Table 14. Resource utilisation per patient and treatment episode in patients treated with humid environment cure

	Materials	Nursing time*	Hospital stay*	Extra stay in socio-sanitary centre*
	Euros	Hours	Extra stay days	Extra stay days
I	5,0 €	3,1	0,0	0,0
II	82,8 €	4,8	4,5	0,6
III	245,5 €	16,3	9,3	1,6
IV	661,4 €	40,3	17,0	6,3
All	189,0 €	12,4	6,6	1,5
*Mean nursing time/total time necessary for the lesion to cicatrise.				

Table 15. Resource utilisation per patient and treatment episode in patients treated with traditional cure				
	Materials	Nursing time*	Hospital stay*	Extra stay in socio-sanitary centre*
	Euros	Hours	Extra stay days	Extra stay days
I	6,3 €	3,9	0,0	0,0
II	104,3 €	13,6	4,8	0,8
III	276,2 €	37,8	9,9	2,0
IV	539,9 €	70,2	18,4	7,8
All	191,0 €	26,0	7,1	1,9
*Mean nursing time/total time necessary for the lesion to cicatrise.				

But, recognising all its validity today, its meaning should be augmented with a new adjective to accompany the indisputable epidemic profile that the most current studies attest: it is also an “ignored” and unattended” epidemic.

The World Health Organisation’s World Health Report of the year 2003 (21) enumerates three growing threats with grave handicapping and dependence loads not attributable to transmissible diseases. Cardiovascular disease, tobacco-related disease and traffic-related injuries are presented as unattended world epidemics and nobody doubts, at this stage, the validity of the proofs to promote effective initiatives for the promotion and protection of health of these risk groups and combine them with the fight against the persistent epidemics of transmissible diseases.

In the strictest sense of this new nomenclature and maintaining a prudent distance dictated by good sense, seeing the magnitude reached in the most absolute silence, ignorance and connivance of sanitary officials and the citizenry in general, it is understood that in our midst the UPP are to be considered also an unattended old and embarrassing epidemic (we know their cause and the way to prevent almost all of them).

It would be in the interest of all to have the cooperation among professionals, users, relatives and administrations, and a joint effective intervention to eradicate these sad life episodes, just in our country of thousands of handicapped, agonizing elderly people, or people of any age affected by limitations or incapacity to move.

Both cost dimensions can be reduced through:

- Effective prevention measures.
- Ensuring a prompt detection and early treatment.
- Guaranteeing an optimum clinical practice in its assistance with the adoption of modern dressings based on humid environment cure techniques.

It is not possible to further delay a decisive action with efficacious, effective and efficient interventions; and especially permit once and for all the birth of recognition of UPP as a true public health problem.

Finally, to emphasise that our study has permitted us to approach the quantification of some of the variables related to the problem of UPP, although it has not been possible for us to measure the “epidemiology” or the “cost” of the impact of UPP in the suffering and quality of life of those who suffer from it (patients, caretakers, family environment...), variables with great significance and impact in that search for global measurement of the UPP problem.

ACKNOWLEDGEMENTS

To Silvia Orus Puigvert, technical director of Smith&Nephew. Spain.

To Lucía Barrio Pérez, nursing supervisor of the Infectious Disease and Preventive Medicine Management Unit, of the Rioja Health Service.

BIBLIOGRAPHY

1. Torra JE, Rueda J, Soldevilla JJ, Martínez F, Verdú J. First National Study of the Prevalence of Pressure Ulcers in Spain. Epidemiology and defining variables of the lesions and patients. *Gerokomos* 2003; 14 (1): 37-47.
2. Soldevilla J, Torra JE, Verdú J, Rueda J, Martínez F, Roche E. Epidemiology of Chronic Wounds in Spain: Results of the First National Studies on Pressure and Leg Ulcer Prevalence. *Wounds* 2006; 218 (8): 213-26.
3. Allman RM. Pressure ulcer prevalence, incidence, risk factors and impact. *Clinics in Geriatric Medicine* 1997; 13 (3): 421-36.

4. Soldevilla JJ, Torra JE. Epidemiology of pressure ulcers in Spain. Pilot study in the Autonomous Community of La Rioja. *Gerokomos* 1999; 10 (2): 75-87.
5. Bennett G, Dealey C, Posnett J. The cost of pressure ulcers in the UK. *Age and Ageing* 2004; 33: 230-5.
6. National Group for the Study and Counseling on Pressure Ulcers and Chronic Wounds. Discussion Table: "Pressure Ulcers, a challenge for the healthcare system and society. Repercussions at the epidemiologic, ethical, economic and legal levels". Madrid. Barcelona. Logroño: GNEAUPP, 2003. Available at <http://www.gneaUPP.org> (consultado el 19/I/2007).
7. Soldevilla JJ, Torra JE, Verdú J, Martínez F, López P, Rueda J, Mayán JM. Second National Study of Prevalence of Pressure Ulcers in Spain, 2005. *Epidemiology and defining variables of lesions and patients. Gerokomos* 2006; 17 (3): 154-72.
8. National Institute of Statistics. Revision of the Municipal Register 2005. Data at the national, autonomous community and provincial levels. Population by age (five-year groups) and sex. available at: <http://www.ine.es/in-ebase/cgi/axi> (consulted on 27-06-2006).
9. Institute of Sanitary Information. Ministry of Health and Consumption. Statistics of Sanitary Establishments with Inpatient Regimens, 2003. Available at: <http://www.msc.es/edtaEstudios/estadisticas/es-tHospiInternado/inforAnual/home.htm> (consulted on 27-06-2006).
10. Care of persons in Dependence Situation in Spain. White Book. Madrid: Ministry of Labour and Social Matters, 2005.
11. San Miguel L, Torra JE, Verdú J. Economics of pressure ulcer care: review of the literature on modern versus traditional dressings. *JWC* 2007; 16 (1): 5-9.
12. Infection by HIV and AIDS in Spain. Multi-sectoral Plan. Indicators 2006. Madrid: Ministry of Public Health and Consumption, 2006.
13. Mata M, Antonanzas F, Tafalla M, Sanz P The cost of type 2 diabetes in Spain: the CODE-2 study. *Gac Sanit.* 2002; 16 (6): 511-20.
14. Jonsson B; CODE-2 Advisory Board. Revealing the cost of Type II diabetes in Europe. *Diabetologia.* 2002; 45 (7): S5-12.
15. Anaya J et al. Epidemiological Study of pressure lesions in a public hospital. *Gerokomos* 2000; 11 (2): 102-10.
16. Thomas DR, Goode PS, Tarquine PH, Allman RM. Hospital-acquired pressure ulcers and risk of death. *J Am Geriatr Soc* 1996; 44 (12): 1435-1440.
17. Clough NP The cost of pressure area management in an intensive care unit. *J Wound Care* 1994; 3: 33-5.
18. Allman RM. The impact of pressure ulcers on health care cost and mor-tality. *Advances of Wound Care* 1998; 11 (3 sUPPI): 2.
19. Verdú J, Nolasco A, García C. Analysis and evolution of mortality by pressure ulcers in Spain. Period 1987-1999. *Gerokomos* 2003; 14 (4): 212-26.
20. Hibbs P The economics of pressure ulcer prevention. *Decubitus* 1988; 1 (3): 32-8.
21. World Health Organisation. Report on World Health 2003: shaping the future. Ginebra: OMS; 2003.