

The Influence of Hospital Clinical Practice on the Costs of Hip and Knee Prostheses

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Arthrosis is highly prevalent in Western countries and knee or hip replacement surgery is very costly, with wide variations in medical practice. The objective of our study, entitled “Total knee and hip prosthesis: variables associated with costs”, was to identify variables that affect the cost of hip and knee replacement surgeries.

Our prospective multicenter study included 1,137 patients scheduled for total hip or knee replacement surgery in 15 hospitals in three Spanish autonomous communities (regions). Data were gathered on a wide range of variables that could affect costs. The costs of the hospital stay took account of all those generated by patients from admission to discharge, both direct costs (including the surgery) and hospital structure costs.

For the results analysis, we considered three model groups that differed in the method of quality of life assessment: the social tariff of the general questionnaire *European Quality of Life-5 Dimensions* (EQ-5D), the two dimensions in the general questionnaire *Short Form-12* (SF-12), and the three dimensions in the arthrosis-specific questionnaire *Western Ontario and McMaster Universities Osteoarthritis Index* (WOMAC). For a better understanding of the methodology and results the reader can read the entire article, referenced at the bottom of the page.

An initial multivariate linear regression analysis of the data yielded similar significant variables in the three model groups. For instance, as shown in the Table 1, costs were lower in larger hospitals than in those with <200 beds [1] and in the Canary Islands and Andalusia in comparison to the Basque Country [2].

In view of these results, we explored whether costs vary among the hospitals and are influenced by differences in hospital organisational protocols and clinical practice. For this purpose, we performed a multilevel analysis of random effect (patient as first level and hospital as second), using the same model groups and finding similar results for significant variables among them; however, the difference among hospitals as a function of the number of beds and the difference between the Canary Islands and Basque Country lost statistical significance. The variability in costs among patients was explained by the variability in the second level (hospitals), which ranged between 44% and 46% (Intraclass Correlation Coefficient). Our multilevel analysis allowed us to demonstrate the strong influence of the hospital on stay costs, a major contribution of this study. We believe that these findings may be relevant to many other surgical procedures and that there may be opportunities for important cost reductions, given the differences observed in relation to clinical practices rather than the clinical condition of the patients.

The hospital stay is the most influential factor in the cost of hip and knee replacement surgery. The length of stay of patients is determined not only by their state of health but also by the explicit or implicit functioning of the traumatology departments of the hospital and by the criteria of attending traumatologists. Between 2007 and 2010, the mean length of hospital stay for hip replacement procedures was reduced by 15% in Andalusia, an illustration of the advances made in cost reductions.

References

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	Reference category	Categories	B	P	b'	min95%	max95%
Nº beds	<200c	200-499c	-0.221	0.000	0.802	0.729	0.882
		>=500c	-0.144	0.002	0.866	0.790	0.949
Region	Basque Country	Canaries	-0.193	0.003	0.824	0.726	0.937
		Andalusia	-0.626	0.000	0.535	0.483	0.592
Surgery	Hip	Knee	0.058	0.065	1.059	0.997	1.126
Age			0.004	0.004	1.004	1.001	1.007
Sex	Female	Male	0.007	0.810	1.007	0.948	1.070
BMI			0.000	0.883	1.000	0.993	1.006
Physical component (SF-12)			-0.003	0.128	0.997	0.992	1.001
Mental Component (SF-12)			-0.002	0.049	0.998	0.996	1.000
Charlson Index			0.027	0.018	1.027	1.005	1.050
Local complications			0.136	0.010	1.146	1.034	1.270
General complications			0.120	0.008	1.127	1.032	1.231
Economic dependency of the hospital	Social Security	Region	0.138	0.000	1.147	1.072	1.228
		Public entity	0.533	0.000	1.704	1.504	1.929
		Private	-0.186	0.035	0.831	0.699	0.987
Caregiver	No	Yes	-0.038	0.243	0.962	0.902	1.027

b, coefficient of the variable

b', exponential of b for obtaining the percentage of the cost with respect to the reference category

Min: Minimum; Max: Maximum; BMI: Body Mass Index

Table 1: Differences in hospital organisational protocols and clinical practice.

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