

Is there increasing difficulty in managing patients hospitalized in medical services?[☆]



¿Existe una creciente dificultad en el manejo de los pacientes hospitalizados en servicios médicos?

Dear Editor,

The hospitalization of patients, particularly those with lower comorbidity, can be avoided through the availability of effective drugs for outpatient treatment, outpatient interventionist procedures (or those with brief hospitalizations), short-stay units, outpatient centers and home hospitalization, among other healthcare modalities. As a result, patients hospitalized in medical departments have increasingly complex conditions, thereby making physicians' tasks more complicated. The purpose of this study was to verify whether there has been an increase in the difficulty of medical care for patients hospitalized in medical departments and the potential causes for this increase.

We conducted an observational, retrospective study that analyzed hospital discharges from the departments of cardiology, gastroenterology, internal medicine, pulmonology and neurology during 2010, 2012 and 2014. To measure the healthcare difficulty, we used the hospital stay, mortality, all-cause readmissions to any department within the 15 days following discharge and the total number of interconsultations requested from all hospital departments and, specifically, from medical departments. To assess the potential causes for the increase in care difficulty, we considered age, sex, urgent admissions, Charlson comorbidity index (CCI) (validated for use with administrative databases¹ and with updated weights²) and the number of diagnoses at discharge. The data were obtained from the minimum basic data set and the computer program for requesting interconsultations. Due to their low complexity, we excluded interconsultations requested of the departments of endocrinology (most of which were for diet and special nutrition prescriptions), oncology (chemotherapy assessments) and hematology (chemotherapy assessments or anticoagulation control).

The quantitative variables are expressed with the mean, and the qualitative variables are expressed using percentages, with their corresponding 95% confidence intervals (95% CI). We studied the trends using the analysis of variance with polynomial contrasts and with the Mantel-Haenszel linear trend test. To quantify the differences, we compared the data from 2010 and 2014. The differences in means were assessed with Student's *t*-test, and the categorical variables were assessed using the odds ratio (OR). We adjusted the length of stay with a multiple linear regression model. The multivariate study of the qualitative variables was

performed with logistic regression models. For the analysis, we established statistical significance at $p < .05$ and employed the SPSS statistical package 15.0 (SPSS Inc., Chicago, Illinois, US).

A total of 8983, 7700 and 7775 patients were discharged from the medical area in 2010, 2012 and 2014, respectively, 82%, 81% and 79% of whom were analyzed, respectively. We excluded from the analysis the discharges from medical departments with a low number of hospitalized patients (rheumatology and endocrinology) or with highly specific and selected patients (hematology and oncology). The results are shown in [Table 1](#).

The results show that age, comorbidity and requests for interconsultations are higher for medical patients, with significant differences between the various departments. Therefore, the joint assessment of the departments participating in the study offers a more homogeneous view, because it is not affected by each department's hospitalization policy or characteristics. We found no publications on the difficulty in providing care caused by changes in complexity, nor are there indicators on this issue, that we know of.

The increase in age is associated with greater comorbidity, although more than 50% of those younger than 65 years have multimorbidity.³ The incidence of adverse events increases with age,⁴ as do the number of administered drugs and drug interactions.⁵

Comorbidity is probably the factor that most complicates patient treatment, given that it is associated with increased hospital mortality,⁶ stays,⁶ costs,⁶ readmissions⁶ and adverse events.⁴ We observed an increase in the CCI and the number of diagnoses at discharge, parameters that reflect the medical comorbidity and, indirectly, the difficulty of managing the patients. Mortality and hospital stay are 2 other parameters that could indirectly measure the difficulty of patient management. Hospital stay also predicts the healthcare cost⁷ and risk of adverse events.⁸ Despite the greater age and comorbidity observed in the study, the length of stay was not increased (and even decreased), which could be explained by the increase in interconsultations. An improved general operation of the hospital and the effect of the medical shift could also have affected mortality, which was already observed in the surgical area.⁹

Readmission is considered an adverse result and a marker of healthcare quality.¹⁰ The earlier the readmission, the greater the relationship with the care received during the previous hospitalization.¹¹ We therefore shortened the readmission period to 15 days to better ensure this relationship. Furthermore, patients who were readmitted required, in the previous hospitalization, the collaboration of other departments to a greater degree than nonreadmitted patients, probably due to the patients' greater comorbidity¹² and difficulty of management. However, there was no increase in readmissions during the study. In this respect, the higher number of requested interconsultations could have had a significant impact.

We consider the interconsultation an appropriate parameter for assessing the difficulty of care, given that interconsultations are typically requested because the physician responsible for the patient does not feel sufficiently qualified to resolve all the problems. We observed a significant increase in the request for interconsultations,

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Table 1 Temporal evolution of the complexity of admissions to medical area departments.

	2010	2012	2014	LT 10–12–14 p value	Dif/OR 2010–2014	
					Dif/OR	Adjusted Dif/OR
<i>Cardiology</i>						
Patients	898	857	765			
*Age, years	66.5 (65.6–67.5)**	67.8 (66.8–68.8)	69.1 (68.1–70.1)	<.001	2.6 (1.2–3.9) p < .001	
Female, %	33.9 (30.8–36.9)	40.4 (37.1–43.7)	37 (33.6–40.4)	ns	OR 1 (0.9–1.1)	
Emergency admissions, %	97.3 (96.3–98.4)	84.1 (81.7–86.6)	88.6 (86.4–90.9)	<.001	OR 0.7 (0.6–0.8) p < .001	
*ND	7.8 (7.5–8)	8.6 (8.4–8.8)	8.9 (8.6–9.1)	<.001	1.1 (0.8–1.4) p < .001	
*CCI	3.2 (3.1–3.4)	3.5 (3.3–3.6)	3.8 (3.6–3.9)	<.001	0.5 (0.3–0.8) p < .001	
*Hospital stay, days	6.9 (6.6–7.3)	6.7 (6.3–7.2)	5.3 (5–5.7)	<.001	–1.6 (–2.1 to –1.1) p < .001	–0.5 (–0.6 to –0.4) p < .001
Exitus, %	1.7 (0.8–2.5)	0.5 (0–0.9)	1.7 (0.8–2.6)	ns	OR 1 (0.8–1.2)	OR 0.9 (0.7–1.5)
Readmissions, %	4.5 (3.1–5.8)	5.8 (4.3–7.4)	6.9 (5.1–8.7)	.029	OR 1.1 (1–1.3) p = .03	OR 1.1 (0.9–1.2)
*PIC TOT	0.21 (0.18–0.23)	0.26 (0.23–0.29)	0.24 (0.21–0.27)	ns	0.03 (–0.01–0.07)	0.02 (0.01–0.03) p < .001
*PIC MA	0.11 (0.09–0.13)	0.13 (0.1–0.15)	0.12 (0.1–0.14)	ns	0.01 (–0.02–0.04)	0.01 (0.002–0.02) p = .009
<i>Gastrointestinal</i>						
Patients	867	775	843			
*Age, years	58.4 (57.2–59.6)	59.3 (58.1–60.6)	61.9 (60.6–63.1)	<.001	3.5 (1.8–5.2) p < 0.001	
Female, %	38.8 (35.5–42)	37.8 (34.4–41.2)	41.8 (38.4–45.1)	ns	OR 1 (0.9–1.1)	
Emergency admissions, %	69.8 (66.7–72.8)	59.9 (56.4–63.3)	71.1 (68–74.1)	ns	OR 1 (0.9–1.1)	
*ND	7.2 (7–7.5)	9.1 (8.8–9.3)	9.4 (9.1–9.6)	<.001	2.2 (1.8–2.5) p < .001	
*CCI	3.9 (3.6–4.2)	5.6 (5.3–6)	5.1 (4.8–5.3)	<.001	1.2 (0.8–1.5) p < .001	
*Hospital stay, days	5.8 (5.4–6.3)	5.3 (4.8–5.7)	6.5 (6–7)	.032	0.7 (0.1–1.3) p = .034	–0.2 (–0.3 to –0.1) p = .012
Exitus, %	3.5 (2.2–4.7)	2.5 (1.4–3.5)	2.8 (1.7–4)	ns	OR 1 (0.8–1.1)	OR 0.8 (0.7–0.9) p = .002
Readmissions, %	11.3 (9.2–13.4)	17.9 (15.2–20.6)	17 (14.4–19.5)	.001	OR 1.1 (1–1.2) p = .001	OR 1.1 (1–1.2)
*PIC TOT	0.62 (0.59–0.65)	0.61 (0.58–0.65)	0.81 (0.79–0.84)	<.001	0.19 (0.15–0.24) p < .001	0.05 (0.03–0.06) p < .001
*PIC MA	0.11 (0.09–0.13)	0.11 (0.09–0.13)	0.16 (0.14–0.19)	.002	0.05 (0.02–0.08) p < .001	0.01 (–0.01–0.01)
<i>Pulmonology</i>						
Patients	822	628	698			
*Age, years	63.5 (62.4–64.6)	65.8 (64.6–67)	66.2 (65.1–67.3)	.001	2.7 (1.1–4.2) p = .001	
Female, %	35.8 (32.5–39)	33.9 (30.2–37.6)	38.5 (34.9–42.1)	ns	OR 1 (0.9–1.1)	
Emergency admissions, %	92.3 (90.5–94.2)	88.9 (86.4–91.3)	92.7 (90.8–94.6)	ns	OR 1 (0.9–1.1)	
*ND	8 (7.8–8.3)	9.9 (9.6–10.1)	9.9 (9.7–10.1)	<.001	1.9 (1.6–2.2) p < .001	
*CCI	3.6 (3.4–3.8)	3.8 (3.6–4)	4 (3.8–4.2)	.021	0.3 (0–0.6) p = .03	
*Hospital stay, days	9.7 (9.2–10.2)	10.7 (9.7–11.7)	10 (9.3–10.7)	ns	0.3 (–0.6–1.1)	–0.1 (–0.31–0.11)
Exitus, %	2.1 (1.1–3)	2.2 (1.1–3.4)	1.7 (1–2.3)	ns	OR 1 (0.8–1.2)	OR 0.9 (0.8–1.1)
Readmissions, %	8.8 (6.8–10.7)	8.3 (6.1–10.4)	6.6 (4.7–8.4)	ns	OR 0.9 (0.8–1.1)	OR 0.9 (0.8–1) p = .003

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