

PREDICTIVE MODEL OF HOSPITAL MORTALITY RISK OF COMPLEX CHRONIC PATIENTS OR PATIENTS WITH ADVANCED DISEASE IN A GERIATRIC CENTER

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BACKGROUND

Identifying the risk factors of the patients that are more susceptible to present drug-related problems (DRPs) promotes a closer pharmacotherapy monitoring that prevents the morbidity and mortality of these patients.

OBJECTIVE

Develop a predictive model of hospital mortality risk in older patients.

MATERIAL AND METHODS

We included patients >64 years admitted in a geriatric center with 233 beds of a university hospital in January-September 2016. We determined the relationship between mortality and number of DRPs detected during admission adjusted to these variables: age, sex, admission unit (acute geriatrics unit (AGU), convalescence, psychogeriatrics), Barthel index and Pfeiffer test before the admission, length of stay (LOS), number of chronic drugs/patient, type of DRPs (indication, effectivity, security, others) and number of the potentially inappropriate prescriptions (PIP, according to STOPP-START 2015, Beers 2015 and Priscus 2010 criteria) with pharmacist intervention.

We used a predictive model of multivariate logistic regression; including the significant variables in the bivariate analysis by using chi-square test for binary qualitative variables, Kruskal-Wallis for >2 categories and U-Mann-Whitney for quantitative variables. In the bivariate model, $p \leq 0.1$ was considered statistically significant and in multivariate, $p < 0.05$. Statistical analysis was performed with Stata13 software.

RESULTS

Patients included: 523. Admission unit: AGU 359 (68.6%) patients; Convalescence 103 (19.7%); Psychogeriatrics 61 (11.6%). Median age: 86 (82-89) years. Females: 292 (55.8%). Discharged: 488 (93.3%) patients. *Exitus*: 102 (19.5%) patients.

Out of 13 potential predictors, 8 were statistically significant in the bivariate analysis and 3 in the multivariate analysis.

Protective factors: Barthel index (OR=0.99; 95% CI=0.98-1.00); LOS (OR=0.97; 95% CI=0.95-0.99); number of chronic drugs/patient (OR=0.97, 95% CI=0.91-1.04); intervention of PIPs (OR=0.91; 95% CI=0.69-1.20); DRP security (OR=0.34, 95% CI=0.08-1.47).

Risk factors: age (OR=1.05; 95% CI=1.00-1.09); Pfeiffer test (OR=1.03; 95% CI=0.93-1.13); psychogeriatrics unit admission (OR=2.58; 95% CI=1.19-5.58).

	POTENTIAL PREDICTORS	OR	95% CI	p
Protective factor	Barthel index	0.99	0.985-1.005	0.282
Protective factor	Length of stay	0.97	0.953-0.991	0.004
Protective factor	Number of chronic drugs/patient	0.97	0.906-1.041	0.412
Protective factor	Intervention of PIPs	0.91	0.689-1.204	0.514
Protective factor	DRP security	0.34	0.077-1.466	0.147
Risk factor	Age	1.05	1.003-1.091	0.036
Risk factor	Pfeiffer test	1.03	0.935-1.131	0.568
Risk factor	Psychogeriatrics admission unit	2.58	1.189-5.582	0.016

The model likelihood-ratio test was significant (chi-square=37.46, df=10, $p < 0.001$). Regarding the goodness-of-fit test, the model explains 13.0% of data uncertainty (Nagelkerke index). It correctly classifies mortality in 82.21% of patients. **Sensitivity:** 8.33%. **Specificity:** 99.4%. **Positive predictive value:** 77.78%. **Negative predictive value:** 82.3%. The AUC of the ROC curve for the mortality and mortality predicted variable was 0.69 (95% CI=0.653-0.741).

CONCLUSIONS

The results indicate that this logistic model acceptably classifies patients with increased risk of mortality, and helps us to identify patients candidate to undergo pharmacotherapy monitoring.

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References: Parameswaran Nair N, Chalmers L, Peterson GM, Bereznicki BJ, Castelino RL, Bereznicki LR. Hospitalization in older patients due to adverse drug reactions -the need for a prediction tool. Clinical interventions in aging. 2016;11:497-505.